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Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1

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Prepared by the Environmental Programs Directorate

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EXECUTIVE SUMMARY

This investigation report presents the results of investigation activities at 47 solid waste management units (SWMUs) and areas of concern (AOCs) in the Upper Los Alamos Canyon Aggregate Area at Los Alamos National Laboratory (the Laboratory). The SWMUs and AOCs are located in Technical Area 00 (TA-00), former TA-01, TA-03, former TA-32, TA-41, TA-43, and TA-61.

The objective of this investigation was to define the nature and extent of contamination at the 47 sites and, if the nature and extent of contamination are defined, to determine whether the sites pose a potential unacceptable risk to human health or the environment. This report presents the results of site-characterization activities conducted during the 2008–2009 investigation, as directed by the investigation work plan for Upper Los Alamos Canyon Aggregate Area, submitted to the New Mexico Environment Department (NMED) in April 2006. The work plan was revised and approved by NMED in November 2006.

The sites investigated include former industrial and sanitary waste lines, septic systems, drainlines and outfalls, surface disposal areas, and areas of suspected soil contamination. Most of the sites are related to past activities at the original technical area of the Laboratory (TA-01), in what is now the Los Alamos townsite. These sites were active in the 1940s and 1950s and have since been demolished, remediated, and used for county, commercial, and residential development.

The investigation activities conducted in 2008–2009 included the collection of 761 surface and shallow subsurface soil, sediment, and rock samples from 413 locations, from the surface to a maximum depth of 32.5 ft below ground surface. The samples were analyzed for inorganic chemicals, including metals, cyanide, nitrate, and perchlorate; organic chemicals, including volatile organic chemicals, semivolatile organic chemicals, polychlorinated biphenyls, dioxins/furans, pesticides, and total petroleum hydrocarbons; and radionuclides, including americium-241, gamma-emitting radionuclides, isotopic plutonium, strontium-90, tritium, and isotopic uranium. Data from the samples collected during the 2008–2009 investigation were combined with data collected before 2008 that meet current Laboratory data-quality requirements.

The sampling data presented in this report indicate that the extent of contamination has been defined at 20 of the 47 sites investigated. Of the 20 sites for which the nature and extent of contamination have been defined, 19 have been determined to pose no potential unacceptable risk or dose to human health or the environment under the current or reasonably foreseeable future land use. No further investigation or remediation activities are warranted at these sites. One site has a potential unacceptable excess cancer risk under the industrial and residential scenarios, based on polycyclic aromatic hydrocarbon data from an earlier investigation. This site needs further sampling to verify current site conditions and determine the appropriate corrective actions based on current and reasonably foreseeable future land use.

The extent of contamination has not been completely defined at 27 of the 47 sites investigated. Additional sampling is needed to define the vertical and/or lateral extent of one or more contaminants at each of these sites. Once additional data are available and extent is defined, human health and ecological risk screening assessments will be conducted to determine if those sites pose a potential unacceptable risk to human health or the environment.

Based on data from the current investigation, 9 of the 27 sites where extent is not defined are proposed for removal actions. Following excavation, additional sampling will be conducted at these sites to finalize the definition of extent and confirm the effectiveness of the removal actions. For the remaining 18 sites,

the need for corrective actions will be determined based on the results of additional extent sampling and risk screening.

The Laboratory intends to provide a Phase II investigation work plan to address the additional sampling required to define the extent of contamination, as necessary, at the sites identified in this report. This Phase II work plan will also define specific remediation goals and identify specific sampling locations, sampling depths, and analytical suites required to confirm the effectiveness of all remediation activities.

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1.0 INTRODUCTION

Los Alamos National Laboratory (LANL or the Laboratory) is a multidisciplinary research facility located in north-central New Mexico, approximately 60 mi northeast of Albuquerque and 20 mi northwest of Santa Fe. The Laboratory site covers 40 mi^2 of the Pajarito Plateau, which consists of a series of finger-like mesas separated by deep canyons containing perennial and intermittent streams running from west to east. Mesa-tops range in elevation from approximately 6200 to 7800 ft above sea level.

The Laboratory's Environmental Programs (EP) Directorate, which includes the former Environmental Restoration Project, is participating in a national effort by U.S. Department of Energy (DOE) to clean up sites and facilities formerly involved in weapons research and development. The goal of EP 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, EP is currently investigating sites potentially contaminated by past Laboratory operations. The sites under investigation are designated as either solid waste management units (SWMUs) or areas of concern (AOCs).

This investigation report addresses sites in Technical Area 00 (TA-00), former TA-01, TA-03, former TA-32, TA-41, TA-43, and TA-61 within the Upper Los Alamos Canyon Aggregate Area. These sites are potentially contaminated with hazardous chemicals and radionuclides. Corrective actions at the Laboratory are subject to the March 1, 2005 Compliance Order on Consent (the Consent Order). Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to the New Mexico Environment Department (NMED) in accordance with DOE policy.

1.1 General Site Information

Figure 1.1-1 shows the location of Upper Los Alamos Canyon Aggregate Area and surrounding technical areas. The Upper Los Alamos Canyon Aggregate Area consists of 115 sites, 54 of which were previously investigated and/or remediated and were approved for no further action (LANL 2006, 091915). Those 54 sites were not proposed for further investigation or other activities in the April 2006 investigation work plan (LANL 2006, 091916) and are not discussed further in the investigation activities or results sections of this investigation report.

The remaining 61 sites were evaluated in the investigation work plan (LANL 2006, 091916). Of these 61 sites, 47 sites (2 in TA-00, 32 in TA-01, 4 in TA-03, 5 in TA-32, 1 in TA-41, 2 in TA-43, and 1 in TA-61) underwent sampling in 2008–2009. Deferred action was proposed and approved by NMED for eight sites (LANL 2006, 091916; NMED 2006, 095460). No sampling was proposed and approved by NMED for six sites (LANL 2006, 091916; NMED 2006, 095460). Table 1.1-1 lists the 61 sites, with a brief description, list of previous investigations, and investigation conducted in 2008–2009 for each site.

TA-00 includes all Laboratory-related operations and sites outside former or current Laboratory boundaries. These sites are geographically separated and scattered across the Pajarito Plateau in the northern part of Los Alamos County and in adjacent Santa Fe County. The TA-00 sites that are included in Upper Los Alamos Canyon Aggregate Area are located in Los Alamos Canyon and the Los Alamos townsite.

Former TA-01 was the Laboratory's first technical area. Beginning in 1943, it housed the Laboratory administration, theoretical divisions, plutonium chemistry, and physics research. Between 1943 and 1945, much of the theoretical, experimental, and production work in developing the atomic bomb took place at former TA-01. From 1946 to 1965, these activities had been moved elsewhere in the Laboratory and the

site underwent decontamination and decommissioning (D&D) in 1966. The site of former TA-01 lies within the current townsite of Los Alamos, on the north and south sides of Trinity Drive surrounding Ashley Pond. The properties are owned privately, by Los Alamos County, and by DOE.

TA-03 is located on South Mesa between Los Alamos Canyon to the north and Twomile Canyon to the south, and is the Laboratory's main technical area. It contains most of the Laboratory's administrative buildings and public and corporate access facilities. In addition, TA-03 houses several Laboratory activities such as experimental sciences, special nuclear materials, theoretical/computations, and physical support operations.

Former TA-32 was a small medical research facility consisting of three laboratories, an office building, a warehouse, and a valve house. Work at the site included biological research involving radionuclides. The site of former TA-32 is located within the current townsite of Los Alamos, approximately 400 ft east of Knecht Street and 400 ft south of Trinity Drive. Various Los Alamos County buildings and operations now occupy the area on the mesa-top, and DOE owns the land below mesa-top.

TA-41 lies within Los Alamos Canyon on DOE property, between TA-43 to the west and TA-02 to the east. Built in the 1950s to house tritium work, TA-41 was used for a variety of administrative, technical, and nontritium research and development activities. In addition, tritium gas mixtures were prepared for use in nuclear testing. TA-41 facilities include laboratory/industrial buildings and structures that are currently in use or planned for reactivation or that are inactive and planned for demolition.

TA-43 is located on East Mesa next to the Los Alamos Medical Center (LAMC). In the past, TA-43 was used for industrial hygiene research; currently, it is used for biomedical research.

TA-61 is located on Sigma Mesa, which is bounded by Los Alamos Canyon on the north and Sandia Canyon on the south. It includes physical support and infrastructure facilities, such as a municipal sanitary landfill, Los Alamos County's Eco Station trash and recycling facility, sewer pump stations, general storage sheds, and general warehouse storage for maintenance activities performed throughout the Laboratory.

1.2 Purpose of Investigation

The objective of the investigation was to collect samples to define the nature and the lateral and vertical extent of contamination for the 47 SWMUs and AOCs located at TA-00, former TA-01, TA-03, former TA-32, TA-41, TA-43, and TA-61. As part of those field activities, another objective was to remove inactive structures related to the sites, where appropriate, and to conduct confirmatory sampling after removing the structures (LANL 2006, 091916). An additional objective is to determine whether contamination at any of the sites poses a potential unacceptable risk to human health or the environment. This report presents details and results of the investigation activities conducted within the Upper Los Alamos Canyon Aggregate Area in 2008–2009 and presents recommendations at each site.

1.3 Scope of Activities

The Upper Los Alamos Canyon Aggregate Area investigation work plan was submitted to NMED in April 2006 (LANL 2006, 091916), and the Laboratory received a notice of disapproval (NOD) in August 2006 (NMED 2006, 093541). A response to the NOD was submitted to NMED (LANL 2006, 094200) and the investigation work plan was subsequently approved in November 2006 (NMED 2006, 095460). The work plan, as modified by the NOD and approved by NMED, proposed to collect soil, fill, tuff, and/or sediment samples from more than 300 locations at 45 sites and to implement a phased sampling approach at 2 additional sites. Site investigation began in September 2008 and finished in

March 2009; a total of 701 investigation samples were collected from 330 locations at 47 sites, plus 80 field duplicate samples, 87 field trip blank samples, and 78 equipment rinsate samples.

The samples were analyzed for all or a subset of the following: target analyte list (TAL) metals, cyanide (total), nitrate, perchlorate, explosive compounds, polychlorinated biphenyls (PCBs), semivolatile organic compounds (SVOCs), total petroleum hydrocarbons-diesel range organics (TPH-DRO), TPH-gasoline range organics (TPH-GRO), volatile organic compounds (VOCs), dioxins/furans, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium.

1.4 Overview of Investigation Report

Section 1 presents general site information, the purpose of the investigations, and an overview of the site investigations. Section 2 presents site background information, including operational history, historical releases, and summaries of previous investigations for each TA. Section 3 presents the current regulatory criteria for human health screening levels, ecological screening levels, and cleanup standards. Section 4 describes the field activities performed during the investigations. Sections 5 through 11 present the results of field investigations, site contamination, determination of nature and extent, and summaries of human health and ecological risk screening assessments for each site at TA-00, former TA-01, TA-03, former TA-32, TA-41, TA-43, and TA-61, respectively. Section 12 presents the conclusions of the investigations. Section 13 presents recommendations for each site. Section 14 includes a list of references cited and a list of map data sources for all figures and plates.

Appendices include acronyms, a metric conversion table, and definitions of the data qualifiers (Appendix A); field methods (Appendix B); borehole logs (Appendix C on DVD); analytical-program descriptions and summaries of data quality (Appendix D); field and analytical records (Appendix E on DVDs); data review (Appendix F); risk screening assessments (Appendix G); and investigation-derived waste (IDW) storage and disposal documentation (Appendix H).

2.0 BACKGROUND

2.1 TA-00

One SWMU and four AOCs at TA-00 are addressed in this report (Table 1.1-1).

- SWMU 00-017 consists of industrial waste lines.
- AOC 00-031(a) is the potentially contaminated soil beneath a former service station of the Zia Company.
- AOC 00-031(b) is the potentially contaminated soil beneath two underground storage tanks (USTs) at the former Zia Company motor pool facility.
- AOC 00-034(b) is an aboveground surface disposal area.
- AOC C-00-042 is the site of a 2500-gal. steel waste oil UST at the former Zia Company motor pool facility.

SWMU 00-017 includes former line 167, former manhole (unassigned land release) (ULR) 33, and lines 170 and 171. Former line 167 and former manhole ULR-33 were removed by 1985, except for the anchors and sections of pipe encased in anchors. Lines 170 and 171 are the only sections of industrial waste line known to remain in Los Alamos townsite. The site of former line 167 and former manhole

ULR-33 under the Omega Bridge remains undeveloped. Nine concrete anchors and 3-ft-long sections of pipe encased in each of the anchors remain at the site.

AOC 00-031(a) is located in the parking lot of Best Western Hilltop House Hotel. AOCs 00-031(b) and C-00-042 are located near Los Alamos National Bank (LANB) and are entirely developed and built over.

Only SWMU 00-017 and AOC 00-031(a) were investigated in 2008–2009; the remaining sites were approved for no sampling (NMED 2006, 095460). Plate 2.1-1 shows the locations of SWMU 00-017 and AOC 00-031(a) in TA-00.

2.1.1 Operational History

The industrial waste lines were installed to serve the entire Laboratory since the Laboratory was established in 1943. With an estimated total length of 39,000 ft, the underground industrial waste lines and associated sumps and pumps were used to transport waste generated by various operations to treatment facilities. The estimated operation period for the majority of these waste lines is from the 1950s to the 1970s. Phased decommissioning and removal of the waste lines began in 1964, and various removal projects were completed through 1986.

The Zia Company motor pool facility [AOCs 00-031(b) and C-00-042] and service station [AOC 00-031(a)] operated approximately from the late 1950s to the mid-1960s. The property was transferred to Los Alamos County in 1967. AOCs 00-031(b) and C-00-042 are on land currently owned by LANB. AOC 00-031(a) is currently on land owned by the Hilltop House Hotel.

AOC 00-034(b) was a suspected pit identified from a 1946 aerial photograph and included in the Operable Unit (OU) 1071 Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) work plan (LANL 1992, 007667, p. 5-133). However, based on interviews and an examination of the aerial photograph, the suspected pit was actually a surface staging area for soil or tuff fill material used for building roads and home sites in the privately owned western housing area and was not used for land disposal of solid waste (LANL 1997, 059367, p. 7).

2.1.2 Historical Releases

The industrial waste lines carried contaminated liquid wastes generated by various Laboratory operations. Contamination was found when the waste lines and associated structures were excavated (Gunderson and Ahlquist 1979, 008897, pp. 24–36). As a result, the soil and/or tuff in the surrounding environment may be contaminated.

At the site of former Zia Company motor pool facility and service station, contaminants including fuel, oil, solvents, and detergents may have been released to the environment through past operations and/or leaks from the underground fuel tanks. As a result, contaminants may be present in soil and/or tuff.

2.1.3 Summary of Previous Investigations

A Phase I RFI was conducted at SWMU 00-017 in 1998 and 1999. Samples were collected at the site of former line 167 and at lines 170 and 171 and were analyzed at off-site laboratories for various combinations of the following: metals, cyanide (total), PCBs, pesticides, SVOCs, VOCs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium. The results were summarized in the historical investigation report for Upper Los Alamos Canyon Aggregate Area (LANL 2006, 091915).

No previous investigations were conducted at AOCs 00-031(a) and 00-034(b).

A Phase I RFI was conducted at AOC 00-031(b) in 1994. The two USTs were excavated and removed along with the auxiliary pipe, the distribution line, and contaminated soil. Verification samples were collected at the bottom and on walls of the excavations. Sampling results obtained at on-site laboratories indicated nondetects or very low levels of petroleum hydrocarbons. The NMED UST Bureau completed its review of this investigation and did not require any additional work to be performed at this site (NMED 1994, 058861.129).

The fuel tank of AOC C-00-042 was discovered during the construction of the LANB building in 1995. A voluntary corrective action (VCA) was conducted to remove the tank, along with the surrounding contaminated soil. Verification samples were collected, and sampling results obtained at on-site laboratories indicated that organic chemicals were below screening action levels (SALs) and all metals were below background (LANL 1996, 054618, p. 9). The site was released to the construction contractor to complete the LANB building.

2.2 Former TA-01

Thirty SWMUs and four AOCs at former TA-01 are addressed in this report (Table 1.1-1).

- SWMUs 01-001(a,b,c,d,e,f,g,o,s,t,u) are septic tanks and sanitary waste lines. Seven are septic tanks [01-001(a,b,c,d,e,f,g)], and four are sanitary waste lines [01-001(o,s,t,u)].
- SWMU 01-002 is an industrial waste line.
- SWMUs 01-003(a,b,d,e) and AOC 01-003(c) are landfills.
- SWMUs 01-006(a,b,c,d,h,n,o) and AOCs 01-006(e,g) are drainlines, storm drains, and their outfalls. Five are drainlines [SWMUs 01-006(a,b,c,d,e)], and four are storm drains [SWMUs 01-006(g,h,n,o)].
- SWMUs 01-007(a,b,c,d,e,j,l) and AOC 01-007(k) are areas of suspected subsurface soil contamination.

Starting in 1976, land located in former TA-01 was transferred from DOE to Los Alamos County and private parties. Except for the sites located on the slope of Los Alamos Canyon that are still on DOE land, the majority of these sites are located within the Los Alamos townsite on private land or county property. These sites have been backfilled, regraded, and recontoured, and have undergone significant construction since the property transfer. No evidence of previous TA-01 Laboratory structures exists in the area.

SWMU 01-007(l) and AOC 01-003(c) were approved for no sampling (NMED 2006, 095460) and were not investigated in 2008–2009. The remaining 32 SWMUs and AOCs were investigated in 2008–2009, and their locations are shown on Plate 2.2-1.

2.2.1 Operational History

The approximately 50-acre mesa-top area of former TA-01 was the location of the initial Los Alamos Scientific Laboratory (LASL) from 1943 to 1965. During this time, research work on nuclear weapons was carried out. Operations at former TA-01 were gradually relocated to new TAs from 1945 to 1965. Phased D&D activities began at former TA-01 in 1953 and continued through 1976 (Ahlquist et al. 1977, 005710, p. 2).

SWMUs 01-001(a,b,c,d,e,f,g,o,s,t,u) are septic tanks and sanitary waste lines. Seven are septic tanks [SWMUs 01-001(a,b,c,d,e,f,g)], and four are sanitary waste lines [SWMUs 01-001(o,s,t,u)].

SWMU 01-002, the industrial waste line, consisted of an extensive network of underground drains and pipelines that collected fluids from process buildings.

SWMUs 01-003(a,b,d,e) and AOC 01-003(c) are landfills. SWMU 01-003(a) is the Bailey Bridge landfill located at the head of Bailey Bridge Canyon. SWMU 01-003(b) and AOC 01-003(c) are the surface-disposal sites for construction debris, which was reportedly dumped over the north rim of Los Alamos Canyon. SWMU 01-003(d) is the Can Dump Site located on the hillside above the Los Alamos Canyon just south of the current U.S. West Communications Facility.

SWMU 01-003(e) is the surface-disposal site southeast of Los Alamos Inn and is partly on the mesa top and partly on the Los Alamos Canyon hillside. The origin of the construction debris at this site is not documented.

SWMUs 01-006(a,b,c,d,h,n,o) and AOCs 01-006(e,g) are drainlines, storm drains, and their outfalls. Five are drainlines [01-006(a,b,c,d,e)] and four are storm drains [01-006(h,g,n,o)]. They either discharged directly into Los Alamos Canyon or released effluent onto the ground surface near the buildings they served.

SWMUs 01-007(a,b,c,d,e,j,l) and AOC 01-007(k) are areas of suspected subsurface soil contamination. Subsurface contamination may be present in soil beneath and adjacent to former TA-01 structures. Most of these locations are currently beneath paved roads, parking lots, commercial buildings, or townhouses, which comprise a major portion of the present-day Los Alamos townsite. The suspected soil contamination could have resulted from original Laboratory operations or from demolition and removal of buildings.

2.2.2 Historical Releases

Releases from septic systems, the industrial waste line, drainlines, and storm-water drainages occurred as a result of normal site operations (e.g., discharges from outfalls) and accidental spills or releases. No documentation exists to estimate the volumes or rates of the flow of the effluent from septic system outlet pipes, industrial waste line, drainlines, or storm-water drainages to outfalls.

Releases from septic tanks and sanitary waste lines [SWMUs 01-001(a,b,c,d,e,f,g,o,s,t,u)] may have occurred as a result of leaks that may have caused subsurface contamination. Discharges from outfalls, as a result of normal site operation, may have caused surface and subsurface contamination on the hillside of Los Alamos Canyon.

Releases from the industrial waste line (SWMU 01-002) may have occurred as a result of leaks and may have caused subsurface contamination. Although the entire industrial waste line had been removed, residual contamination may remain in the former location of the industrial waste line. The discharge location from the industrial waste line (TA-45) falls within the Pueblo Canyon Aggregate Area.

Placement of contaminated materials at landfills [SWMUs 01-003(a,b,d,e) and AOC 01-003(c)] may have caused surface and subsurface contamination on the hillside of Los Alamos Canyon.

Contamination from drainlines, storm drains, and their outfalls [SWMUs 01-006(a,b,c,d,h,n,o) and AOCs 01-006(e,g)] may have occurred as a result of leaks and intentional discharges.

Contamination at the areas of suspected subsurface soil contamination [SWMUs 01-007(a,b,c,d,e,j,l) and AOC 01-007(k)] may be a direct result of spills or releases that may have caused surface and subsurface contamination.

2.2.3 Summary of Previous Investigations

The Ahlquist radiological survey was conducted from 1974 to 1976 (Ahlquist et al. 1977, 005710). During the survey, all the septic tanks were removed, except for SWMU 01-001(e) because the tank was not located. It was determined the tank had been removed before 1974. Most of the central sanitary waste line [SWMU 01-001(o)] was removed in 1959 (Buckland 1959, 003426), and the rest of the line was removed during the Ahlquist radiological survey (Ahlquist et al. 1977, 005710, p. 126).

A portion of the western sanitary waste line [SWMU 01-001(s)] was removed in the 1960s (Buckland 1973, 058138), and more was removed in 1994 and 1996 during Phase I RFI (LANL 1997, 056660.4). It is possible that some portions of SWMU 01-001(s) and SWMU 01-001(u) were removed during the construction of the Timber Ridge condominiums in the 1970s.

The main portion of the industrial waste line (SWMU 01-002) was verified as completely removed, and a substantial amount of contaminated soil associated with the industrial waste line was removed during the Ahlquist radiological survey (Ahlquist et al. 1977, 005710, pp. 83, 90, 92, 94). In 1985, the last remnants of the industrial waste line between former TA-01 and the Acid Canyon outfall near former TA-45 were removed (Elder et al. 1986, 006666, p. 37). An interim action was conducted in 1990 at the route of former industrial waste line between Central Avenue and Rose Street at the Central School site in response to a request from Los Alamos schools (LANL 1990, 007501). No contamination was detected.

The drainlines of SWMUs 01-006(b,c,d) were also removed during the Ahlquist radiological survey. No record can be found on the removal of the drainline of SWMU 01-006(a); however, the current location of the drainline is under one of the Los Arboles townhouses. It was probably removed during building construction, if not before then. The drainlines to Ashley Pond [AOC 01-006(e)] may still be in place because no record of removal has been found. However, the drainlines were not encountered during the 2008–2009 investigation.

All storm drains [SWMU 01-006(h,n,o) and AOC 01-006(g)] were surveyed during the Ahlquist radiological survey and were removed after all the Laboratory buildings were demolished and the ground recontoured.

Contaminated soil at SWMUs 01-007(a,b,c,d,e,j) was also removed during the Ahlquist radiological survey.

Several Phase I RFIs were conducted for the sites in former TA-01 at various times from 1992 to 1996. Samples were collected and analyzed at both on-site and off-site laboratories. Samples analyzed at off-site laboratories included various combinations of the following: metals, PCBs, pesticides, SVOCs, VOCs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium. Results were presented in the historical investigation report for Upper Los Alamos Canyon Aggregate Area (LANL 2006, 091915).

In addition, an interim action was conducted at SWMU 01-001(d) from 1996–1997 to remove contaminated soil on the hillside. A VCA was also conducted at SWMU 01-001(f) in 1996 to remove contaminated soil at another location on the canyon slope. A VCA was conducted at SWMU 01-003(d) in 1995 to remove deteriorating paint cans and a paint spill on the canyon slope.

The historical investigation report for Upper Los Alamos Canyon Aggregate Area (LANL 2006, 091915) provides details of the investigations and interim and corrective actions described above.

2.3 TA-03

Four SWMUs and one AOC at TA-03 are addressed in this report (Table 1.1-1).

- AOC 03-008(a) is the former site of a decommissioned firing site.
- SWMU 03-009(j) is a former surface disposal site, now located under the parking lot at the Laboratory's Wellness Center.
- SWMUs 03-038(a) and 03-038(b) are a former pump house with two concrete underground tanks and a former 28,500-gal. steel waste-holding tank, respectively. These sites, which are next to each other on the south rim of Los Alamos Canyon near the Omega Bridge, comprise Consolidated Unit 03-038(a)-00. All the structures were removed in 1981 and 1982, and the site is currently undeveloped.
- SWMU 03-055(c) is the outfall of an active storm-drain system that previously received effluent from the floor drains of a nearby fire station. The storm drain currently collects and channels stormwater runoff from parking lots and roads near the Laboratory's fire station.

AOC 03-008(a) was approved for no sampling (NMED 2006, 095460) and was not investigated in 2008–2009. The remaining four SWMUs were investigated, and their locations are shown on Plate 2.1-1.

2.3.1 Operational History

The firing site, AOC 03-008(a), housed a production shop, storage building, hutments, and magazines and was used to manufacture and test detonators between 1943 and 1949 (LANL 1990, 007511; LANL 1995, 057590, p. 6-38).

The surface disposal area, SWMU 03-009(j), contained construction debris as stated by site workers (Griggs 1993, 076167) and could also have contained a water tank (LANL 1990, 007511).

The pump house of Consolidated Unit 03-038(a)-00 was the central collection point for industrial wastes from various Laboratory buildings. The building, along with the concrete tanks and the steel holding tank, was constructed in 1952. Wastes were pumped from the tanks into the industrial waste line leading to the TA-50 radioactive liquid waste treatment facility through 1965. The pump house and associated components became inactive in 1965. The associated waste lines are not included in the consolidated unit.

2.3.2 Historical Releases

Historical releases at the firing site, AOC 03-008(a), resulted from explosives-detonation activities. The site was decommissioned almost 60 yr ago and is no longer evident.

The surface disposal site, SWMU 03-009(j), was never used to manage hazardous wastes or constituents, and no contaminants are suspected at this site.

In 1976, radioactive contamination was discovered to the west, south, and east of the pump house at Consolidated Unit 03-038(a)-00, although no leaks were discovered from the tanks when they were removed in 1980 and 1981 (Elder et al. 1986, 006666, p. 41).

The storm drain, SWMU 03-055(c), was connected to the floor drain of the fire station (building 03-41) but currently collects only stormwater runoff from the parking lots north of the fire station and channels stormwater toward Los Alamos Canyon.

2.3.3 Summary of Previous Investigations

Engineering drawings and aerial photographs were reviewed in researching the former site of AOC 03-008(a), and it was concluded that the site was located near the current intersection of Diamond Drive and Jemez Road and that the site is no longer evident.

No previous investigations were conducted at SWMU 03-009(j).

The areas around Consolidated Unit 03-038(a)-00 were remediated by the Zia Company in 1975 (LANL 1993, 020947, p. 6-8). Contaminated soil was excavated to the west, south, and east of the pump house in 1976. The pump house and associated components were removed in 1981 and 1982 as part of the radioactive liquid waste lines removal project conducted between 1981 and 1986 (Elder et al. 1986, 006666, p. 41).

The stormwater drainage channel associated with SWMU 03-055(c) was sampled by Environmental Management Division in 1992 as part of a reconnaissance survey associated with the construction of the Industrial Partnership Center at TA-03, and no contaminants were identified based on on-site laboratory data (LANL 1995, 057590, p. 6-39).

2.4 Former TA-32

Three SWMUs and two AOCs at former TA-32 are addressed in this report (Table 1.1-1).

- SWMU 32-001 is the former location of an incinerator.
- SWMU 32-002(a) is a former septic tank and its associated drainline.
- SWMU 32-002(b) is former septic tank and its associated drainline and outfall.
- AOC 32-003 is the former location of a transformer station.
- AOC 32-004 is a former drainline and outfall.

The site of former TA-32 was occupied by the medical research facility in 1944, and after the research group expanded, operations were moved to TA-43 in 1953. All the structures at former TA-32 were removed after 1954. Currently, the site is mostly covered with asphalt pavement, and Los Alamos County uses the site to store equipment and materials for road work and maintenance. Maintenance activities may include the use of solvents, lubricants, and fuels; emptying of street sweeper contents until moved to a disposal facility; staging of asphalt, road salt, and other materials; and vehicle cleaning.

All five sites were investigated in 2008–2009. Plate 2.1-1 shows the locations of these SWMUs and AOCs in former TA-32.

2.4.1 Operational History

The incinerator, SWMU 32-001, adjoined the northeast corner of a laboratory (building 32-1). It received combustible waste generated at the medical research facility. The ash was disposed of off-site by the Zia Company (LANL 1996, 052928, p. 10). The incinerator operated from 1948 to 1954 and was removed in 1954.

The septic system, SWMU 32-002(a), received waste from building 32-1 and discharged to Los Alamos Canyon. Research activities at the site involved plutonium-238, plutonium-239, americium-241, and carbon-14. Inorganic and organic chemicals also may have been used at the facility. The laboratory

(32-01) operated from 1944 to 1953 and was decommissioned in 1954. The septic tank was removed but no archival records are available on removal date or disposition of the tank. The drainline was removed in 1996.

The septic system, SWMU 32-002(b), was installed when SWMU 32-002(a) septic system could no longer meet the usage requirement of the laboratory (32-1). The influent line of SWMU 32-002(a) was diverted to the septic tank of SWMU 32-002(b), which also received effluent from building 32-2. The outfall of SWMU 32-002(b) was at the edge of Los Alamos Canyon. The septic tank was removed in 1988, and the drainline was removed in 1996.

The location of the former transformer station, AOC 32-003, was discovered during 1993 Phase I RFI. At the site, three transformers sat on a wooden platform on poles, approximately 20 ft aboveground (LASL 1948, 091749).

The drainline and outfall, AOC 32-004, served building 32-3 and discharged directly to Los Alamos Canyon without passing through a septic tank. Building 32-03 included a vault room where a radioactive source was stored. Part of the drainline was removed in 1996, and because no contamination was found inside the pipe, the rest of the drainline was left in place and each end was grouted (LANL 1996, 059178, p. 58).

2.4.2 Historical Releases

Although contaminated waste (e.g., animal carcasses) was picked up on an on-call basis, it is possible the animal carcasses and excrement waste streams were incinerated on-site at SWMU 32-001.

Research activities at building 32-1 involved radionuclides. Inorganic and organic chemicals may also have been used. Because no industrial waste line served former TA-32, it is possible chemical and radioactive wastes may have been disposed of in sinks and drains connected to the septic systems of SWMUs 32-002(a) and 32-002(b).

AOC 32-003 was discovered because analytical results from samples collected in the immediate area indicated PCB contamination (LANL 1995, 048944, p. 34).

Building 32-3 had a vault room where a radioactive source was stored. The drainline of AOC 32-004 led directly to an outfall at the edge of the mesa without passing through a septic tank.

2.4.3 Summary of Previous Investigations

A Phase I RFI was conducted at former TA-32 in 1993. Samples were collected at SWMUs 32-001, 32-002(a), and 32-002(b) and AOC 32-003 and analyzed at on-site laboratories or did not have sufficient documentation to be validated. During the Phase I RFI, it was also discovered that the previously identified location of SWMU 32-002(a), where samples had been collected, was incorrect, and further investigation of AOC 32-004 was recommended.

A Phase II RFI and VCA were conducted at former TA-32 in 1996. Drainlines of SWMU 32-002(a) and SWMU 32-002(b) were removed, and part of the drainline of AOC 32-004 was also removed. Remedial activities included excavation of contaminated soil at SWMUs 32-002(a) and 32-002(b) and AOC 32-003. Samples collected at all five sites were analyzed at off-site laboratories for various combinations of the following: metals, SVOCs, VOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium. Results were presented in the historical investigation report for Upper

Los Alamos Canyon Aggregate Area (LANL 2006, 091915). These data, combined with data from samples collected in 2008–2009, are presented in this investigation report.

2.5 TA-41

Four SWMUs and two AOCs at TA-41 are addressed in this report (Table 1.1-1).

- SWMU 41-001 is a septic system that served a guardhouse (structure 41-2) from 1949 to 1953. The guardhouse has been relocated from its original place and is currently not being used, but the septic system, SWMU 41-001, is believed to remain in place. The pipeline is partially under asphalt pavement and partially in undeveloped land; the septic tank is in undeveloped land.
- SWMUs 41-002(a), 41-002(b), and 41-002(c) are the Imhoff tank, the chlorine contact tank, and the sludge drying bed, respectively, of an inactive wastewater treatment facility. SWMUs 41-002(a,b,c) comprise Consolidated Unit 41-002(a)-99.
- AOC 41-003 is the former location of an inactive sump pit that discharged to Los Alamos Canyon. It is currently located beneath a ventilation system situated on a concrete pad.
- AOC C-41-004 is a storm drain system surrounding a laboratory (building 41-4). The storm drain system is in use, and the catch basins/manholes are located within and under the pavement that surrounds the building.

Currently, access to buildings/structures at TA-41 is controlled by gates at the site, and the TA is protected by 8- to 10-ft security fences.

Only SWMU 41-001 was investigated in 2008–2009. The other SWMUs and AOCs were previously approved for deferred investigation (NMED 2006, 095460). Plate 2.1-1 shows the location of SWMU 41-001 in TA-41.

2.5.1 Operational History

The septic system, SWMU 41-001, received sanitary waste from the guardhouse from 1949 to 1953.

The wastewater treatment facility was built in 1951 and received sanitary waste from TA-41 and TA-02 until 1987. After 1987, the facility was left in place and was designated Consolidated Unit 41-002(a)-99 in 1999.

The sump, AOC 41-003, received effluent from floor and sink drains at the underground storage vault (structure 41-1), stormwater, and rinse water from the storage tunnel. In 1988, the sump and associated pipes were excavated, removed, and reburied approximately 20 ft south of their original location to make room for a concrete pad, retaining wall, and structures supporting a ventilation-system upgrade for the vault.

The storm drain system, AOC C-41-004, still serves building 41-4, a laboratory.

2.5.2 Historical Releases

For the septic system, it is unlikely that sewage from a guardhouse contained contamination. The overflow from the tank emptied into a 4-in. drain-tile line that discharged to Los Alamos Canyon.

The wastewater treatment facility discharged to Los Alamos Canyon through the National Pollutant Discharge Elimination System– (NPDES-) permitted outfall SSS06S during its operation until 1987. It was removed from the Laboratory's NPDES permit effective December 14, 1990.

The underground storage vault was first occupied in 1949 and was used to store transuranic wastes and tritium. When the sump was relocated in 1988, the drainlines outside the vault and the sump structure were monitored and were not found to be radioactively contaminated (Larson 1992, 044022). The sump also discharged to Los Alamos Canyon.

The storm drain system serves an active facility (building 41-1) and discharges to Los Alamos Canyon. Building 41-1 is the core facility at TA-41 and has been in use since the early 1940s. Radioactive samples were handled at TA-41, isotopic analyses were conducted at the site, and radioactive materials, toxic gases, mercury, and various organic chemicals were used during operations. However no indications of contaminant releases to the storm drain system have been found. Operational tritium releases from the emission stacks located between building 41-1 and former building 41-30 may have resulted in surface contamination of the storm drain system.

2.5.3 Summary of Previous Investigations

A Phase I RFI was conducted at TA-41 in 1995. Samples were collected and analyzed at off-site laboratories for various combinations of the following: uranium, SVOCs, VOCs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium. The results were presented in the historical investigation report for Upper Los Alamos Canyon Aggregate Area (LANL 2006, 091915). These data, combined with data from samples collected during the 2008–2009 investigation, are presented in this report.

A radiation walkover survey was conducted in or next to the eastern portion of TA-41 on October 17 and 18, 2000. The surveys did not reveal any surface contamination (LANL 2000, 091505; LANL 2000, 091507; LANL 2000, 091508; LANL 2000, 091509; LANL 2000, 091510).

2.6 TA-43

Two SWMUs and three AOCs at TA-43 are addressed in this report (Table 1.1-1).

- SWMU 43-001(a1) is the sanitary waste line that served the Health Research Laboratory (HRL) before 1981, when it was disconnected from the sanitary waste system. It is currently under the pavement north of the HRL and under the LAMC.
- AOC 43-001(a2) is the sanitary waste system that has served TA-43 since 1981 and currently is connected to the Laboratory sanitary wastewater system consolidation facility at TA-46.
- AOC 43-001(b2) is a storm drain outfall permitted in the mid-to-late 1970s under the NPDES permit (Outfall 03A040). It discharges west of the HRL to the south-facing slope of Los Alamos Canyon.
- SWMU 43-002 is an inactive incinerator that was used at the HRL. It was removed in 1992, but the stack and the ash pit are still in place in Room B-137 in building 43-1.
- AOC C-43-001 is a storm drain outfall that collects runoff from the HRL (building 43-1) loading dock and functions as the overflow from the lift station (structure 43-10). It discharges south of the HRL to the south-facing slope of Los Alamos Canyon.

Only AOC 43-001(b2) and AOC C-43-001 were investigated in 2008–2009. The other SWMUs and AOC were previously approved for deferred action (NMED 2006, 095460). Plate 2.1-1 shows the locations of the two investigated AOCs in TA-43.

2.6.1 Operational History

SWMU 43-001(a1), a 4-in. cast-iron sanitary sewer line, served building 43-1 and discharged to the Los Alamos County Bayo Canyon wastewater treatment plant (WWTP) until 1981, at which time it was decommissioned and disconnected (Emelity 1981, 008081). AOC 43-001(a2), the sanitary waste system, started service in December 1981 and discharged to the Laboratory's sanitary sewer system in TA-03. Beginning in 1992, the sanitary waste from building 43-1, including treated cooling water, once-through cooling water, and photoprocessing chemicals, was redirected to the Laboratory sanitary wastewater system consolidation facility at TA-46.

The storm drain outfall, AOC 43-001(b2), was permitted in the mid-to-late 1970s as NPDES Outfall 03A040 and removed from LANL's NPDES permit January 11, 1999. The outfall received effluent from six floor drains in the sub-basement at the HRL (building 43-1), blow-down from the evaporative cooler, and storm water from 13 roof drains on the west side of the HRL (Santa Fe Engineering Ltd. 1992, 058455). The effluents discharged west of the HRL through a 130-ft. long, 12-in. corrugated metal pipe to Los Alamos Canyon.

The storm drain outfall, AOC C-43-001, receives discharges from two storm drains that collect runoff from the HRL loading dock and from the overflow at a lift station (structure 43-10), and drains onto the south-facing slope of Los Alamos Canyon.

The incinerator, SWMU 43-002, was installed in Room B-137 of building 43-1 in 1952 to dispose of pathological organic wastes that were contaminated with trace quantities of nontransuranic isotopes. The incinerator was removed in 1992 (Watanabe 1993, 058453) and Room B-137 was remodeled. The remaining stack and ash pit are inside an active facility.

2.6.2 Historical Releases

Trace amounts of a wide range of radionuclides were used in many animal studies at HRL. While all of the materials were disposed of by packaging as radioactive waste and shipped to TA-54, it is possible that some of the waste could have been disposed of in the drains (Potter 1994, 058454) until 1975. After that time, containers were provided for the transfer of contaminated liquid wastes to the Laboratory's industrial waste treatment plant at TA-50. Treated cooling water, once-through cooling water, and wastes from photoprocessing were routed to the sanitary waste system at various times. After 1987, recovery units, collection points, and the types of photochemicals being used were upgraded in an attempt to eliminate hazardous constituents. There are no known leaks in the sanitary waste system currently serving the HRL.

Contaminants may have been released to the environment through the outfalls. The storm drain outfall, AOC 43-001(b2), may have historically discharged radioactively contaminated water and/or once-through and treated cooling water (DOE 1987, 008663). The storm drain outfall, AOC C-43-001, may have received sanitary waste if an overflow had occurred and/or radioactive, nonsanitary cooling water, although no documentation was found of any routine releases into the storm drains.

The pathological organic wastes incinerated were contaminated with trace quantities of nontransuranic isotopes. The incinerator, SWMU 43-002, was removed in 1992, the passage to the stack was sealed off

with concrete mortar, and the top of the stack was blocked with a stack cover (Watanabe 1993, 058453). The ash pit remains and the cleanout door is located in the east wall of the HRL.

2.6.3 Summary of Previous Investigations

No previous investigations have been conducted at any of the TA-43 SWMUs or AOCs.

2.7 TA-61

Only one site at TA-61 (SWMU 61-007) is addressed in this report (Table 1.1-1). SWMU 61-007 is a former transformer-staging site along the south side of East Jemez Road. Currently, the site is under a dirt road and parking lot area near the Los Alamos County landfill, and is not occupied. Plate 2.1-1 shows the location of SWMU 61-007 in TA-61.

2.7.1 Operational History

SWMU 61-007 is the location of a transformer-staging site of an electrical contracting firm that once operated in the area. The firm is no longer in business; its years of operation are not known (LANL 1990, 007511).

2.7.2 Historical Releases

It is suspected that the subsurface soil was contaminated by releases of PCB-containing oil from transformers. In 1989, workers detected an organic odor while excavating a trench for a new sewer line along the south side of East Jemez Road, approximately 0.75 mi east of the intersection of East Jemez Road and Diamond Drive. Chemical analysis of the soil determined that the soil was contaminated with PCBs and 1,2,4-trichlorobenzene (Nylander 1989, 062843).

2.7.3 Summary of Previous Investigations

The site was cleaned up under the Toxic Substances Control Act by the Laboratory's Health, Safety, and Environment Division in 1989, and regulatory closure was verbally approved by EPA Region 6 (LANL 1997, 055510).

3.0 REGULATORY CRITERIA

This section describes the criteria used to screen chemicals of potential concern (COPCs) and to evaluate potential risk to ecological and human receptors. Regulatory criteria identified in the Consent Order include cleanup standards, risk-based screening levels, and risk-based cleanup goals for each pertinent medium at the subject site.

3.1 Screening Levels

Soil screening levels (SSLs) from NMED guidance (NMED 2006, 092513) were used for human health risk screening levels for nonradionuclide COPCs. The NMED SSLs are based on a target hazard quotient (HQ) of 1.0 and a target cancer risk of 1×10^{-5} (NMED 2006, 092513). For COPCs for which no NMED value is available, U.S. Environmental Protection Agency (EPA) regional screening levels (available at http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm) were used. The EPA screening levels for

carcinogens were multiplied by 10 to adjust to the NMED target cancer risk of 1×10^{-5}. Exposure parameters used to calculate the SSLs are presented in Appendix G, Table G-4.1-1.

SALs derived using the RESRAD Model, Version 6.21 (LANL 2005, 088493) were used for human health risk screening levels for radionuclide COPCs. The radionuclide SALs are based on a 15 mrem/yr dose per DOE guidance (DOE 2000, 067489). Exposure parameters used to calculate the SALs are provided in Appendix G, Tables G-4.1-2 and G-4.1-3.

The SSLs and SALs for all COPCs identified in the Upper Los Alamos Canyon Aggregate Area are presented in Table 3.1-1.

3.2 Ecological Screening Levels

Ecological screening levels (ESLs) were obtained from the ECORISK Database, Version 2.3 (LANL 2008, 103352), and are presented in Appendix G, Table G-5.4-1. The ESLs are based on similar species and are derived from experimentally determined no-observed-adverse-effect levels (NOAELs), lowest-observed-adverse-effect levels, or doses determined lethal to 50% of the test population. Information relevant to the calculation of ESLs, including concentration equations, dose equations, bioconcentration factors, transfer factors, and toxicity reference values are presented in the ECORISK Database, Version 2.3 (LANL 2008, 103352).

3.3 Cleanup Standards

As specified in Section VIII.B.1 of the Consent Order, screening levels will be used as soil cleanup levels unless they are determined to be impracticable or values do not exist for the current and reasonably foreseeable future land use. Screening assessments compare COPC concentrations for each site with SSLs depending on the current and foreseeable future land use at each site.

The cleanup goals specified in Section VIII of the Consent Order are a target cancer risk of 1×10^{-5} and a hazard index (HI) of 1.0. For radionuclides, the target dose is 15 mrem/yr based on DOE guidance (DOE 2000, 067489). The screening levels presented in Appendix G (Tables G-4.2-1 through G-4.2-111) are based on these cleanup goals.

4.0 SCOPE OF ACTIVITIES

The following sections describe the scope of activities conducted during the 2008–2009 investigation of the Upper Los Alamos Aggregate Area. Appendix B describes the methods and procedures used in completing the scope.

4.1 Geodetic Survey

Geodetic surveys were conducted at TA-00, former TA-01, TA-03, former TA-32, TA-41, TA-43, and TA-61 in accordance with Standard Operating Procedure (SOP) 5028, Coordinating and Evaluating Geodetic Surveys. A Trimble global positioning system (GPS) 5700 was used to mark the coordinates of all the planned sampling locations identified in the work plan (LANL 2006, 091916) and revisions (LANL 2006, 094200). Horizontal accuracy of the Trimble GPS 5700 was within 0.1 ft. During sampling, if the planned location was offset due to surface or subsurface obstruction the relocated sampling location was surveyed. The surveyed coordinates for all sampling locations are presented in Table 4.1-1.

4.2 Geophysical Survey

No geophysical surveys were performed during the investigation. A previous geophysical survey of AOC 00-031(a) (LANL 1993, 015022) was used to direct the selection of sampling locations at that site. Both ground-penetrating radar (GPR) and magnetic methods were used to locate and characterize subsurface anomalies. Measurements were taken on a 10-ft-grid in the parking lot north of the Hilltop House Hotel. Several subsurface utilities were identified using these geophysical methods. Additionally, GPR was used to locate a set of privately-owned underground fuel tanks at a gas station adjacent to the former Zia service station to ensure that the method would reliably identify any tanks still in place at AOC 00-031(a).

4.3 Excavation

Excavation was performed at only one site during the 2008–2009 investigation. During sampling activities at SWMU 01-001(d), a pipe was found at one of the locations along the path of the septic system pipeline. Section 4.5.3 of the approved work plan (LANL 2006, 091916; NMED 2006, 095460) directed that any pipeline encountered would be removed and inspected for leaks.

Excavation was completed using a standard backhoe. Asphalt pavement and fill material were removed to a depth of approximately 5 ft below ground surface (bgs). Upon excavating, it was determined that the pipe was not a continuous length but several loose fragments of cast-iron pipe and pipe joints buried beneath the paved parking area. The excavation was extended along the path of the former septic system line to determine if additional line was present. No additional pipe was found. The excavated cast-iron pipe was placed in a single 55-gal. drum. Excavated fill material was placed in rolloff containers. A total of approximately 6 yd^3 of fill material was excavated.

The excavation was backfilled with clean fill material obtained from an off-site source. All affected surfaces were restored to approximate original grade and condition. The asphalt pavement was patched to match the existing pavement after backfilling the excavation.

4.4 Collection of Soil, Fill, Tuff, and Sediment Samples

Samples were collected according to the work plan (LANL 2006, 091916) and subsequent revisions (LANL 2006, 094200) and NMED's approval with modifications (NMED 2006, 095460). Table 4.4-1 lists the proposed sampling locations, cross-walked to the locations actually sampled. Appendix B presents deviations from the work plan.

Surface and shallow subsurface samples were collected using a stainless-steel hand auger in accordance with SOP-06.10, Hand Auger and Thin-Wall Tube Sampler. A stainless-steel scoop and bowl were used to transfer samples to sterile sample collection jars or bags for transport to the Sample Management Office (SMO). Samples were shipped from the SMO to off-site contract analytical laboratories for analysis.

In areas where the hand auger met refusal or sampling depths were too great, subsurface samples were collected using a hollow-stem auger drill rig with a stainless-steel core barrel to retrieve material from the advancing hole in accordance with SOP-06.26, Core Barrel Sampling for Subsurface Earth Materials. Core material was transferred to a stainless-steel bowl and broken into smaller pieces using a stainless-steel spoon if necessary to transfer the material in to sterile sample collection jars or bags for transport to the SMO. Samples for VOC analysis were collected before any other samples and before the core material was broken into smaller pieces for containerization.

Details of the methods used for collecting, packaging, documenting, and transporting samples are provided in Appendix B, section B-5.0.

Quality assurance/quality control samples included field duplicate samples collected in accordance with SOP-5059, Field Quality Control Samples. Field duplicate samples were collected at a minimum rate of 1 per 10 investigation samples. Rinsate blanks were also collected at a minimum rate of 1 per 10 investigation samples to confirm decontamination of sampling equipment. Field trip blank samples were collected in conjunction with investigation samples to be analyzed for VOCs, at a minimum rate of 1 per day when VOC samples were being collected.

4.5 Field Screening of Samples Collected

All samples were screened in the field for VOCs and for radioactivity. Samples collected by hand methods (hand auger or spade and scoop) were screened in the collection bowl or sample container after the sample was collected. Cores collected by split-spoon core barrel were screened immediately upon opening the core barrel. Screening results were recorded on the corresponding sample collection log (SCL)/chain-of-custody (COC) forms at the time of sample collection.

Each sample was field-screened for VOCs using a MiniRae 2000 (or equivalent) photoionization detector (PID) with 11.7-eV lamp. The PID was subject to bench calibration yearly by the vendor and field calibrated daily by field personnel using a standard source of 100 ppm isobutylene. All daily calibration procedures for the MiniRAE 2000 PID met the manufacturer's specifications for standard reference gas calibration and the requirements of SOP-5006, Control of Measuring and Test Equipment. The rated detection limit for the MiniRae 2000 is 0.2 ppm. Results of PID screening are presented for each sample in Table 4.5-1.

Each sample was also field screened for gross alpha and beta/gamma radiation using an Eberline E-600. Radiological field screening of all samples was conducted by Laboratory radiological control technicians (RCTs) using appropriately calibrated instruments. Calibration of radiological instruments was performed and documented by the RCTs. All calibrations performed met the manufacturer's specifications, the requirements of SOP-5006, and the applicable radiation detection instrument manual. Field radiation-screening results are presented in Table 4.5-1.

4.6 Equipment Decontamination

All sampling equipment was decontaminated before each sample was collected to avoid cross-contamination of samples. Equipment was also decontaminated before moving to another sampling location. Residual material adhering to the equipment was removed using dry decontamination methods, in accordance with SOP-5061, Field Decontamination of Equipment. All parts of the equipment were thoroughly cleaned with Fantastik and clean paper towels. To verify the effectiveness of equipment decontamination, equipment rinsate blanks were collected from the sampling equipment at a frequency of 1 rinsate blank for every 10 investigation samples and analyzed for TAL metals, perchlorate, and cyanide (total). At sites where a drill rig was used, the drill rig was surveyed by RCTs and certified for release before it was moved from the site. The drill rig was also inspected before being brought on site, and surveyed by RCTs before being released back to the drilling contractor.

4.7 Storage and Disposal of Investigation-Derived Waste

The IDW generated as a result of field-investigation activities included drill cuttings, excavated material (soil, asphalt and concrete pavement removed to access the material below, cast iron pipe), used

personal protective equipment (PPE), and miscellaneous materials used during dry decontamination of sampling equipment (e.g., paper towels and nitrile gloves). The IDW was characterized as specified in the approved waste characterization strategy form (WCSF). All waste was placed in approved containers, and was managed in accordance with SOP-5022, "Characterization and Management of Environmental Restoration (ER) Project Waste." The management of IDW is described in Appendix H. All available waste documentation, including WCSFs, WCSF amendments, and waste profile forms, are provided in Appendix H.

5.0 TA-00 SITE INVESTIGATIONS

TA-00 includes sites outside the former and current boundaries of the Laboratory. Two sites at TA-00 were sampled (Table 1.1-1). SWMU 00-017 was sampled according to the approved work plan (LANL 2006, 091916; NMED 2006, 095460). At AOC 00-031(a), a historical as-built engineering drawing (U.S. Atomic Energy Commission 1947, 105350) discovered after the work plan was approved provided credible evidence of the former location of USTs at the site. Subsurface samples were collected at in the area of the former tanks to confirm the tanks are not present and no residual contamination related to former underground gasoline or diesel storage tanks at the site is present.

5.1 Field-Investigation Results at TA-00

5.1.1 Surface Conditions

The TA-00 sites investigated are located in mesa-top areas to the north of Los Alamos Canyon, within or next to the Los Alamos townsite (Plate 2.1-1). Much of the natural mesa-top surface soil in the Upper Los Alamos Canyon Aggregate Area, including TA-00, has been altered by development.

SWMU 00-017 is located under paved parking areas and buildings at LAMC and extends into and across Los Alamos Canyon to the south, crossing steep canyon slopes and the canyon bottom. The DOE Omega Bridge crosses the canyon above the alignment of the part of SWMU 00-017 in the canyon. Nine concrete anchors and 3-ft-long sections of pipe encased in each of the anchors remain at the site. The canyon slopes consist mainly of bare tuff with only small, isolated pockets of soil and sediment. The canyon bottom includes alluvial material and soil or sediment. Vegetation on the canyon slopes and in the canyon bottom consists of widely scattered trees and shrubs, including ponderosa pine, piñon pine, juniper, and an understory of native grasses.

AOC 00-031(a) is located entirely on the mesa-top, in the asphalt-paved parking area of the Best Western Hilltop House Hotel. The material immediately beneath the pavement is probably fill material with no native soil remaining. The site is flat, with no vegetation other than landscaping plants bordering the parking lot.

5.1.2 Exploratory Drilling or Excavation Investigations

No exploratory drilling or excavation was conducted at the TA-00 sites. All drilling was for the purpose of collecting samples.

5.1.3 Subsurface Conditions

No subsurface man-made structures are known to remain at the portion of SWMU 00-017 sampled during the 2008–2009 investigation, although portions of the industrial waste line are present under the LAMC parking area and building.

Numerous utility lines and a stormwater drainline were identified below the surface at AOC 00-031(a), but no evidence of USTs was found. The nearest known subsurface structures are USTs associated with the gas station near the northwest corner of the site. The USTs are located on the west side of the privately owned gas station and are not in the immediate vicinity of AOC 00-031(a) (LANL 1993, 015022).

The general stratigraphy of the bedrock beneath TA-00 can be inferred from descriptions of the regional geology (Broxton and Eller 1995, 058207; Broxton et al. 1995, 050119).

- In the western part of TA-00, unit 4 of the Tshirege Member of the Bandelier Tuff (Qbt 4) is present at or near the surface of the mesa. Unit Qbt 4 is no more than 30 ft thick in this area.
- The predominant tuff unit at the surface is unit 3 of the Tshirege Member of the Bandelier Tuff (Qbt 3), a series of volcanic ash fall and ash-flow deposits. Unit Qbt 3 is approximately 100 ft thick.
- Below unit 3 is unit 2 of the Tshirege Member (Qbt 2), which is approximately 65 ft thick.
- Below unit 2 is unit 1v of the Tshirege Member (Qbt 1v), which is approximately 75 ft thick.
- Below unit 1v is unit 1g of the Tshirege Member (Qbt 1g), which is approximately 75 ft thick.
- Below unit 1g is approximately 2 ft of Tsankawi Pumice (Qbtt).
- Below Qbtt is the Cerro Toledo interval (Qct), a zone of reworked tuff approximately 65 ft thick.
- Below the Cerro Toledo interval is the Otowi Member of the Bandelier Tuff (Qbo), which is approximately 230 ft thick.
- Below the Otowi Member lies the Guaje Pumice Bed, which is approximately 35 ft thick.
- Below the Guaje Pumice Bed are the Puye Formation and the Cerros del Rio basalts with a combined thickness of at least 680 ft in this area. The Puye Formation contains the regional groundwater aquifer.

5.1.4 Groundwater Conditions

Groundwater occurs in three distinct modes on the Pajarito Plateau:

- the regional aquifer, the upper surface of which is typically contained within the conglomerates and sandstones of the Puye Formation;
- intermediate-depth saturated horizons; and
- shallow alluvial groundwater found in canyon-bottom alluvium (LANL 1998, 059599).

The top of the regional aquifer is typically 1100–1200 ft bgs of the mesas of the Pajarito Plateau (Figure 5.1-1). Data from wells at the Laboratory and predictions of the hydrogeologic conceptual site model for the Pajarito Plateau place the regional aquifer at an approximate depth of 1100 ft bgs in the western part of TA-00 (LANL 1998, 059599).

The regional aquifer is the only known aquifer in the Los Alamos area capable of producing a water supply. The direction of groundwater flow in the regional aquifer is generally to the east-southeast, toward the Rio Grande. The velocity of groundwater flow ranges from about 20 ft/yr to 250 ft/yr (LANL 1998, 059599). Details of depths to the regional aquifer, flow directions and rates, and well locations are presented in various Laboratory documents (LANL 2000, 066802; LANL 2008, 101932; LANL 2008, 101897).

TA-00 is located on a mesa-top, so no shallow alluvial groundwater is present in the immediate vicinity. No perched groundwater was encountered during sampling at TA-00. Plate 2.1-1 shows the location of all groundwater monitoring wells in the vicinity of TA-00.

No groundwater investigations were included in the scope of this investigation.

5.1.5 Surface Water Conditions

No permanent surface water is present in TA-00. Seasonal precipitation may result in sheet flow runoff from the mesa-top onto the canyon slopes, although most runoff from paved areas is directed into stormwater drains. AOC 00-031(a) is entirely paved, and all precipitation is directed into municipal stormwater drains.

Part of SWMU 00-017 crosses the main channel of Los Alamos Canyon, which is intermittent and generally flows only after summer thunderstorms and during spring snowmelt. Portions of SWMU 00-017 on the steep canyon slopes may receive storm-generated runoff from the mesa-top.

No surface water investigations were included in the scope of this investigation.

5.2 Field-Screening Results—TA-00

Organic vapors were detected at more than 10 ppm above ambient air during PID screening of subsurface cores at AOC 00-031(a). The PID screening result at location 00-604728 (7–8 ft bgs) was 159 ppm. The PID readings decreased with depth from that point. Based on this screening result, a step-out location was drilled further to the east, and an additional sample was collected at a shallower depth than planned at that location (00-604729). The PID screening result at location 00-604729 (4–5 ft bgs) was 60 ppm, and the screening results for the deeper samples at that location were 0 ppm.

No radiological screening results exceeded twice the daily site background levels at SWMU 00-017. Field-screening results for TA-00 are presented in Table 4.5-1.

5.3 Site Contamination—SWMU 00-017

5.3.1 Soil, Rock, and Sediment Sampling

A total of 58 samples were collected from 32 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 00-017, former industrial waste lines. Table 5.3-1 lists the samples collected and the analyses requested for each sample. Figure 5.3-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

5.3.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 5.3-2 lists the inorganic chemicals above background values (BVs) and detected inorganic chemicals that have no BVs at SWMU 00-017. The sampling locations and detected concentrations are shown on Plate 5.3-1.

The identification of inorganic COPCs is presented in Appendix F, section F-2.1.1. The inorganic COPCs identified at SWMU 00-017 are antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper,

total cyanide, iron, lead, magnesium, mercury, nickel, nitrate, perchlorate, selenium, silver, thallium, and vanadium.

Organic Chemicals

Table 5.3-3 lists the detected organic chemicals at SWMU 00-017. The sampling locations and detected concentrations are shown on Plate 5.3-2.

The identification of organic COPCs is presented in Appendix F, section F-2.1.2. The only organic COPC identified at SWMU 00-017 is Aroclor-1254.

Radionuclides

Table 5.3-4 lists the radionuclides detected above BVs or fallout values (FVs), detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 00-017. The sampling locations and detected concentrations are shown on Plate 5.3-3.

The identification of radionuclide COPCs is presented in Appendix F, section F-2.1.3. The radionuclide COPCs identified at SWMU 00-017 are americium-241, cesium-137, plutonium-238, plutonium-239/240, tritium, and uranium-235/236.

5.3.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at SWMU 00-017 is presented in Appendix F, section F-2.1.5. The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs at SWMU 00-017 are defined, except

- the lateral and vertical extent of lead are not defined at SWMU 00-017.

This evaluation of nature and extent of contamination for SWMU 00-017 does not include the entire underground acid/industrial waste line system (LANL 2006, 091915, p. 22; LANL 2006, 091916, pp. 13–15). Additional components of that system are being addressed as part of other aggregate areas and will be integrated into a comprehensive waste line investigation.

5.3.4 Summary of Human Health Risk Screening

Because the extent of contamination has not been defined at SWMU 00-017, no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

5.3.5 Summary of Ecological Risk Screening

Because the extent of contamination has not been defined at SWMU 00-017, no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

5.4 Site Contamination—AOC 00-031(a)

5.4.1 Soil, Rock, and Sediment Sampling

Sampling locations were not specified for AOC 00-031(a) in the work plan (LANL 2006, 091916) but were selected based on a review of geophysical surveys conducted before this investigation was conducted (LANL 1993, 015022). An as-built drawing (U.S. Atomic Energy Commission 1947, 105350) indicated the locations of three USTs at the site, but geophysical results showed that no USTs are present at the site and indicated several utility corridors and shallow backfilled excavations. Five sampling locations were selected, based on the as-built drawing and geophysical results, to verify no USTs are present and to determine if contamination related to the former USTs is present in the subsurface fill and tuff. Field screening results (section 5.2) were also used to refine the sampling approach.

A total of 16 samples were collected from 5 locations and analyzed for TAL metals, SVOCs, TPH-DRO, TPH-GRO, and VOCs at AOC 00-031(a). Radionuclides were analyzed according to the approved work plan (LANL 2006, 091916; NMED 2006, 095460). Table 5.4-1 lists the samples collected and the analyses requested for each sample. Figure 5.4-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

5.4.2 Soil, Rock, and Sediment Analytical Results

Inorganic Chemicals

Table 5.4-2 lists the inorganic chemicals above BVs at AOC 00-031(a). The identification of inorganic COPCs is presented in Appendix F, section F-2.2.1. The only inorganic COPC identified at AOC 00-031(a) is selenium. Selenium was not detected in any samples collected from AOC 00-031(a), but its detection limits exceed the BV. Because it was not detected, there is no figure showing selenium data.

Organic Chemicals

Table 5.4-3 lists the detected organic chemicals at AOC 00-031(a). The sampling locations and detected concentrations are shown in Figure 5.4-2.

The identification of organic COPCs is presented in Appendix F, section F-2.2.2. The organic COPCs identified at AOC 00-031(a) are acetone; benzyl alcohol; bis(2-ethylhexyl)phthalate; 2-butanone; sec-butylbenzene; carbon disulfide; di-n-butylphthalate; ethylbenzene; isopropylbenzene; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; naphthalene; pentachlorophenol; 1-propylbenzene; TPH-GRO; trichlorofluoromethane; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; and xylene (total).

5.4.3 Nature and Extent of Contamination

The lateral and vertical extent of all inorganic and organic COPCs are defined. Radionuclides were not analyzed in samples from AOC 00-031(a). The evaluation of the nature and extent of contamination at AOC 00-031(a) is presented in Appendix F, section F-2.2.5.

5.4.4 Summary of Human Health Risk Screening

The results of the risk screening assessment for the residential scenario at SWMU 00-031(a) are presented in Tables G-4.2-1, G-4.2-2, G-4.2-3, and G-4.2-4.

The total excess cancer risk for the residential scenario is 2×10^{-9}, which is below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HI is 0.02, which is below the NMED target HI of 1.0 (NMED 2006, 092513). For vapor intrusion the total excess cancer risk is approximately 7×10^{-7}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513) and the HI is approximately 0.7, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the screening assessment results, there are no potential unacceptable risks under the residential scenario.

5.4.5 Summary of Ecological Risk Screening

No potential unacceptable risks are present for ecological receptors at SWMU 00-031(a). Ecological risk screening assessments are presented in Appendix G, section G-5.0.

5.5 Conclusions—TA-00

SWMU 00-017

Additional sampling is necessary to define the lateral and vertical extent of lead at SWMU 00-017. Human health and ecological risk screening assessments will be performed after lateral and vertical extent have been defined.

The elevated concentrations of lead detected at SWMU 00-017 may be the result of maintenance activities of the Omega Bridge (i.e., scraping of old paint and reapplying new paint). Although its use has been discontinued, lead-based paint was historically used on the bridge. A more recently identified site, AOC C-00-044, will also be investigated when additional sampling is conducted at SMWU 00-017.

AOC 00-031(a)

Historical information and the results of the current investigation at AOC 00-031(a) confirm no USTs remain in place and no residual contamination related to the USTs is present at the site. The nature and extent of contamination are defined, and there are no potential unacceptable risks to human health or the environment at the site. Therefore, no further investigation or remediation activities are warranted for AOC 00-031(a).

6.0 FORMER TA-01 SITE INVESTIGATIONS

Thirty-two sites at former TA-01 were sampled (Table 1.1-1) according to the approved work plan (LANL 2006, 091916; NMED 2006, 095460), with the exception of the deviations discussed in Appendix B.

6.1 Field-Investigation Results—Former TA-01

6.1.1 Surface Conditions

Former TA-01 is a residential, commercial, and industrial-use area made up of private, Los Alamos County, and DOE lands. It includes both mesa-top and canyon-slope areas (Plates 2.1-1 and 2.2-1).

The TA-01 sites in this investigation are located on or next to county, commercial, and private property as well as DOE property. Many sites are paved with either concrete or asphalt, are under buildings, or are in lawns next to private residences. Some sites are located on both the mesa-top and south-facing slope in Los Alamos Canyon, while others are entirely on south-facing slope or entirely on the mesa-top.

Much of the natural mesa-top soil in former TA-01 has been replaced by fill material during various remediation, construction, and landscaping activities (LANL 2006, 091915; LANL 2006, 091916). The canyon slope consists mainly of bare tuff with only small, isolated pockets of soil and sediment. Media encountered during surface and near-surface sampling at former TA-01 included soil, fill, sediment, and tuff (Qbt 3 and Qbt 1g).

Vegetation at mesa-top sites consists of nonnative grasses, trees, and shrubs planted by property owners. Vegetation on the canyon slope and in the canyon bottom consists of widely scattered native trees and shrubs, including ponderosa pine, piñon pine, juniper, and an understory of native grasses.

6.1.2 Exploratory Drilling or Excavation Investigations

No exploratory drilling was conducted at the TA-01 sites. All drilling was performed for the purpose of collecting investigation samples.

A limited excavation was conducted at SWMU 01-001(d) to expose and remove portions of a septic system drainline encountered during sampling. Excavation revealed the line was not in place, but small pieces of cast-iron pipe and pipe joints were present in the fill material beneath the paved parking area. The pipe and fill from the excavation were removed and managed as waste (Appendix H), and clean fill was placed in the excavation area. After the excavation was backfilled, the pavement was patched to match existing conditions.

6.1.3 Subsurface Conditions

The rock units encountered at and below the surface during investigation of the TA-01 sites were units 3 and 1g of the Tshirege Member of the Bandelier Tuff (Qbt 3 and Qbt 1g). These units are briefly described in section 5.1.3.

The stratigraphy of the Upper Los Alamos Canyon Aggregate Area is described in more detail in the approved work plan (LANL 2006, 091916; NMED 2006, 095460).

Subsurface structures encountered included numerous utilities (which had been marked out before sampling began). The investigation of almost all mesa-top sites was complicated by the high density of utilities (electrical, gas, sewer, water, communication) supplying the businesses and residences. The known utility lines are shown on the site map and the figures showing the sampling locations for each site.

As described in section 6.1.2, portions of a subsurface pipe were encountered while collecting samples at SWMU 01-001(d). In accordance with the approved work plan (LANL 2006, 091916; NMED 2006, 095460), an excavation was opened to expose and remove the pipe, presumed to be the drainline associated with the former septic system. The excavation revealed the drainline was not in place, and only a few short lengths of cast-iron pipe and pipe joints were included in the fill material at the site.

6.1.4 Groundwater Conditions

At mesa-top sites of the Upper Los Alamos Canyon Aggregate Area, the surface is separated from the regional aquifer by an unsaturated zone that is approximately 1000 to 1300 ft thick (Figure 5.1-1). Sampling locations near the bottom of Los Alamos Canyon are approximately 700 ft or more above the regional aquifer. Alluvial groundwater could be present in Los Alamos Canyon in the region of the Upper Los Alamos Canyon Aggregate Area. Groundwater monitoring is currently performed at the Laboratory through an integrated sitewide groundwater monitoring program (LANL 2008, 101897). Plate 2.1-1 shows the locations of all groundwater monitoring wells in the vicinity of former TA-01. No groundwater sampling or other groundwater investigations were included in the scope of this investigation.

6.1.5 Surface Water Conditions

No natural permanent surface water is present at the mesa-top sites of the Upper Los Alamos Canyon Aggregate Area. Although Ashley Pond was once the site of a natural depression that was commonly filled with water, it is now a closed body of water maintained as a Los Alamos County beautification project. During summer thunderstorms and spring snowmelt, runoff may flow from the mesa-top onto the hillsides (canyon slopes) of Los Alamos Canyon. Seasonal flow occurs in the main channel of Los Alamos Canyon in response to spring snowmelt or summer thunderstorms.

No surface water sampling or other surface water investigations were included in the scope of this investigation.

6.2 Field-Screening Results—Former TA-01

No organic vapors were detected at more than 10 ppm above ambient air during PID screening of subsurface cores. No radiological screening results exceeded twice the daily site background levels. Field-screening results for former TA-01 are presented in Table 4.5-1. There were no changes to sampling or other activities as a result of field-screening results.

6.3 Site Contamination—SWMU 01-001(a)

6.3.1 Soil, Rock, and Sediment Sampling

A total of 17 samples were collected from 8 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-001(a), septic tank 134. Table 6.3-1 lists the samples collected and the analyses requested for each sample. Figure 6.3-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.3.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.3-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BV at SWMU 01-001(a). The sampling locations and detected concentrations are shown in Figure 6.3-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.1.1. The inorganic COPCs identified at SWMU 01-001(a) are barium, cadmium, chromium, cobalt, copper, total cyanide, lead, nickel, nitrate, perchlorate, selenium, silver, and vanadium.

Organic Chemicals

Table 6.3-3 lists the detected organic chemicals at SWMU 01-001(a). The sampling locations and detected concentrations are shown in Figure 6.3-3.

The identification of organic COPCs is presented in Appendix F, section F-3.1.2. The organic COPCs identified at SWMU 01-001(a) are acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; chrysene; di-n-octylphthalate; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; methylene chloride; phenanthrene; and pyrene.

Radionuclides

Table 6.3-4 lists the radionuclide detected for which the FV does not apply at SWMU 01-001(a). The sampling locations and detected concentrations are shown in Figure 6.3-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.1.3. The only radionuclide COPC identified at SWMU 01-001(a) is plutonium-239/240.

6.3.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at SWMU 01-001(a) is presented in Appendix F, section F-3.1.5. The lateral and vertical extent of all COPCs at SWMU 01-001(a) are defined except

- the lateral extent of barium, cadmium, cobalt, and vanadium;
- the vertical extent of chromium and nickel;
- the lateral and vertical extent of copper and silver; and
- the lateral and vertical extent of bis(2-ethylhexyl)phthalate.

6.3.4 Summary of Human Health Risk Screening

Because the extent of contamination has not been defined at SWMU 01-001(a), a human health risk screening assessment was not conducted for the site. A human health risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

6.3.5 Summary of Ecological Risk Screening

Because the extent of contamination has not been defined at SWMU 01-001(a), an ecological risk screening assessment was not conducted for the site. An ecological risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

6.4 Site Contamination—SWMU 01-001(b)

6.4.1 Soil, Rock, and Sediment Sampling

A total of 23 samples were collected from 10 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-001(b), septic tank 135. Table 6.4-1 lists the samples collected and the analyses requested for each sample. Figure 6.4-1 shows the sampling locations.

Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.4.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.4-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 01-001(b). The sampling locations and detected concentrations are shown in Figure 6.4-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.2.1. The inorganic COPCs identified at SWMU 01-001(b) are cadmium, chromium, copper, mercury, nickel, nitrate, perchlorate, selenium, and silver.

Organic Chemicals

Table 6.4-3 lists the detected organic chemicals at SWMU 01-001(b). The sampling locations and detected concentrations are shown in Figure 6.4-3.

The identification of organic COPCs is presented in Appendix F, section F-3.2.2. The organic COPCs identified at SWMU 01-001(b) are acetone, Aroclor-1254, bis(2-ethylhexyl)phthalate, bromomethane, 4-isopropyltoluene, and methylene chloride.

Radionuclides

Table 6.4-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 01-001(b). The sampling locations and detected concentrations are shown in Figure 6.4-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.2.3. The radionuclide COPCs identified at SWMU 01-001(b) are cesium-134, plutonium-238, plutonium-239/240, and uranium-235/236.

6.4.3 Nature and Extent of Contamination

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs at SWMU 01-001(b) are defined. The evaluation of the nature and extent of contamination at SWMU 01-001(b) is presented in Appendix F, section F-3.2.5.

6.4.4 Summary of Human Health Risk Screening

The results of the risk screening assessment for the recreational scenario at SWMU 01-001(b) are presented in Appendix G, Tables G-4.2-5, G-4.2-6, and G-4.2-7.

The results of the risk screening assessment for the residential scenario are presented in Appendix G, Tables G-4.2-8, G-4.2-9, G-4.2-10, G-4.2-11, and G-4.2-12.

The total excess cancer risk for the recreational and residential scenarios are 1×10^{-7} and 2×10^{-7}, respectively. These risks are below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HIs are 0.03 and 0.1, which are below the NMED target HI of 1.0 (NMED 2006, 092513).

The total doses for the recreational and residential scenarios are 0.02 mrem/yr and 0.6 mrem/yr, respectively, which are below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the recreational scenario is equivalent to a total risk of 3×10^{-8}, based on conversion from dose using the residual radioactivity computer code RESRAD, Version 6.21 (LANL 2005, 088493). The total dose for the residential scenario is equivalent to a total risk of 1×10^{-6}, based on a comparison with EPA's residential preliminary remediation goals (PRGs) for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

For vapor intrusion the total excess cancer risk is approximately 5×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513) and the HI is approximately 0.0007, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results, there are no potential unacceptable risks or doses under the recreational and residential scenarios.

6.4.5 Summary of Ecological Risk Screening

No potential unacceptable risks are present to ecological receptors at SWMU 01-001(b). Ecological risk screening assessments are presented in Appendix G, section G-5.0.

6.5 Site Contamination—SWMU 01-001(c)

6.5.1 Soil, Rock, and Sediment Sampling

A total of 11 samples were collected from 5 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-001(c), septic tank 137. Table 6.5-1 lists the samples collected and the analyses requested for each sample. Figure 6.5-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.5.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.5-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 01-001(c). The sampling locations and detected concentrations are shown in Figure 6.5-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.3.1. The inorganic COPCs identified at SWMU 01-001(c) are aluminum, antimony, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, total cyanide, lead, magnesium, mercury, nickel, nitrate, perchlorate, selenium, thallium, and vanadium.

Organic Chemicals

Table 6.5-3 lists the detected organic chemicals at SWMU 01-001(c). The sampling locations and detected concentrations are shown in Figure 6.5-3.

The identification of organic COPCs is presented in Appendix F, section F-3.3.2. The organic COPCs identified at SWMU 01-001(c) are Aroclor-1260; benzyl alcohol; tert-butylbenzene; di-n-butylphthalate; isopropylbenzene; and 1,2,4-trimethylbenzene.

Radionuclides

Table 6.5-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 01-001(c). The sampling locations and detected concentrations are shown in Figure 6.5-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.3.3. The radionuclide COPCs identified at SWMU 01-001(c) are plutonium-239/240 and tritium.

6.5.3 Nature and Extent of Contamination

The nature and extent of all inorganic, organic, and radionuclide COPCs at SWMU 01-001(c) are defined. Appendix F, section F-3.3.5, discusses the nature and extent evaluations.

6.5.4 Summary of Human Health Risk Screening

The results of the risk screening assessment for the industrial, recreational, construction worker, and residential scenarios at SWMU 01-001(c) are presented in Appendix G, Tables G-4.2-13 through G-4.2-25.

The total excess cancer risk for the industrial, recreational, construction worker, and residential scenarios are 1×10^{-6}, 6×10^{-7}, 2×10^{-6}, and 4×10^{-6}, respectively. These risks are below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HIs are 0.06, 0.07, 0.3, and 0.2, which are below the NMED target HI of 1.0 (NMED 2006, 092513). The total doses are 0.4 mrem/yr, 0.3 mrem/yr, 2.4 mrem/yr, and 2.6 mrem/yr, respectively, which are below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The total dose for the industrial scenario is equivalent to a total risk of 4×10^{-6}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the recreational scenario is equivalent to a total risk of 5×10^{-8}, based on conversion from dose using RESRAD, Version 6.21. The total dose for the construction worker scenario is equivalent to a total risk of 4×10^{-6}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the residential scenario is equivalent to a total risk of 2×10^{-6}, based on a comparison with EPA's residential PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

For vapor intrusion the HI is approximately 0.0002, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results, there are no potential unacceptable risks or doses under the industrial, recreational, construction worker, and residential scenarios.

6.5.5 Summary of Ecological Risk Screening

No potential unacceptable risks are present to ecological receptors at SWMU 01-001(c). Ecological risk screening assessments are presented in Appendix G, section G-5.0.

6.6 Site Contamination—SWMUs 01-001(d) and 01-006(h)

6.6.1 Soil, Rock, and Sediment Sampling

Samples collected at SWMU 01-001(d) (septic tank 138) are also used for site evaluation at SWMU 01-006(h), because the original location of SWMU 01-006(h) (the stormwater drainage system) has been built over, and it shares the same outfall area of SWMU 01-001(d). The sampling results apply to both sites.

A total of 48 samples were collected from 23 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMUs 01-001(d) and 01-006(h). Table 6.6-1 lists the samples collected and the analyses requested for each sample. Figure 6.6-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.6.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.6-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMUs 01-001(d) and 01-006(h). The sampling locations and detected concentrations are shown on Plate 6.6-1.

The identification of inorganic COPCs is presented in Appendix F, section F-3.4.1. The inorganic COPCs identified at SWMUs 01-001(d) and 01-006(h) are aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, nitrate, perchlorate, selenium, silver, vanadium, and zinc.

Organic Chemicals

Table 6.6-3 lists the detected organic chemicals at SWMUs 01-001(d) and 01-006(h). The sampling locations and detected concentrations are shown on Plate 6.6-2.

The identification of organic COPCs is presented in Appendix F, section F-3.4.2. The organic COPCs identified at SWMUs 01-001(d) and 01-006(h) are acetone; Aroclor-1248; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; chrysene; di-n-butylphthalate; fluoranthene; methylene chloride; pentachlorophenol; phenanthrene; pyrene; and toluene.

Radionuclides

Table 6.6-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMUs 01-001(d) and 01-006(h). The sampling locations and detected concentrations are shown in Plate 6.6-3.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.4.3. The radionuclide COPCs identified at SWMUs 01-001(d) and 01-006(h) are americium-241, cesium-137, plutonium-239/240, strontium-90, uranium-234, and uranium-238.

6.6.3 Nature and Extent of Contamination

Evaluation of the nature and extent of contamination at SWMUs 01-001(d) and 01-006(h) is presented in Appendix F, section F-3.4.5. The nature and extent of contamination at SWMUs 01-001(d) and 01-006(h) are defined for all inorganic, organic, and radionuclide COPCs, except

- the vertical extent of aluminum, antimony, arsenic, barium, beryllium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, and zinc;
- the lateral extent of chromium and nickel; and
- the lateral and vertical extent of cesium-137 and plutonium-239/240.

Plutonium-239/240 (maximum 490 pCi/g) and mercury (maximum 155 mg/kg) were detected at concentrations above residential screening levels at multiple locations. Plutonium was also detected above recreational screening levels at two surface locations. SWMUs 01-001(d) and 01-006(h) will be evaluated further to determine areas for removal of soil material to reduce the concentrations of COPCs.

6.6.4 Summary of Human Health Risk Screening

Because the extent of contamination is not defined at SWMUs 01-001(d) and 01-006(h), no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after any proposed soil removal is conducted and additional samples have confirmed that the remediation is complete and the extent of contamination is defined.

6.6.5 Summary of Ecological Risk Screening

Because the extent of contamination is not defined at SWMUs 01-001(d) and 01-006(h), no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after any proposed soil removal is conducted, and after additional samples have confirmed that the remediation is complete and the extent of contamination is defined.

6.7 Site Contamination—SWMU 01-001(e)

6.7.1 Soil, Rock, and Sediment Sampling

A total of four samples were collected from two locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-001(e), septic tank 139. Table 6.7-1 lists the samples collected and the analyses requested for each sample. Figure 6.7-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.7.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.7-2 lists the inorganic chemicals above BVs at SWMU 01-001(e). The sampling locations and detected concentrations are shown in Figure 6.7-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.5.1. Inorganic COPCs identified at SWMU 01-001(e) are antimony, calcium, and total cyanide..

Organic Chemicals

Table 6.7-3 lists the detected organic chemicals at SWMU 01-001(e). The sampling locations and detected concentrations are shown in Figure 6.7-3.

The identification of organic COPCs is presented in Appendix F, section F-3.5.2. The only organic COPC identified at SWMU 01-001(e) is toluene.

Radionuclides

No radionuclides were detected or detected above BVs/FVs at SWMU 01-001(e), and therefore, no radionuclides are identified as COPCs.

6.7.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at SWMU 01-001(e) is presented in Appendix F, section F-3.5.5. No radionuclide COPCs were identified at SWMU 01-001(e). The lateral and vertical extent of all inorganic and organic COPCs are defined.

6.7.4 Summary of Human Health Risk Screening

The results of the risk screening assessment for the residential scenario at SWMU 01-001(e) are presented in Appendix G, Table G-4.2-26 and Table G-4.2-27.

The HI is 8×10^{-8}, which is below the NMED target HI of 1.0 (NMED 2006, 092513).

For vapor intrusion the HI is approximately 0.000003, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results, there are no potential unacceptable risks under the residential scenario.

6.7.5 Summary of Ecological Risk Screening

No potential unacceptable risks are present to ecological receptors at SWMU 01-001(e). Ecological risk screening assessments are presented in Appendix G, section G-5.0.

6.8 Site Contamination—SWMU 01-001(f)

6.8.1 Soil, Rock, and Sediment Sampling

A total of 43 samples were collected from 21 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-001(f), septic tank 140. Table 6.8-1 lists the samples collected and the analyses requested for each sample. Figure 6.8-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.8.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.8-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 01-001(f). The sampling locations and detected concentrations are shown in Figure 6.8-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.6.1. The inorganic COPCs identified at SWMU 01-001(f) are cadmium, chromium, copper, total cyanide, lead, nickel, nitrate, and selenium.

Organic Chemicals

Table 6.8-3 lists the detected organic chemicals at SWMU 01-001(f). The sampling locations and detected concentrations are shown on Plate 6.8-1.

The identification of organic COPCs is presented in Appendix F, section F-3.6.2. The organic COPCs identified at SWMU 01-001(f) are acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; bromobenzene; chrysene; di-n-butylphthalate; dibenz(a,h)anthracene; 1,2-dichlorobenzene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; methylene chloride; phenanthrene; pyrene; and 1,2,4-trimethylbenzene.

Radionuclides

Table 6.8-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 01-001(f). The sampling locations and detected concentrations are shown on Figure 6.8-3.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.6.3. The radionuclide COPCs identified at SWMU 01-001(f) are cesium-137, plutonium-239/240, tritium, uranium-234, uranium-235/236, and uranium-238.

6.8.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at SWMU 01-001(f) is presented in Appendix F, section F-3.6.5. The nature and extent of contamination at SWMU 01-001(f) are defined except

- the vertical extent of cadmium and copper;
- the lateral and vertical extent of chromium and nickel;
- the lateral and vertical extent of Aroclor-1254;
- the lateral extent of polycyclic aromatic hydrocarbons (PAHs) and methylene chloride; and
- the lateral and vertical extent of plutonium-239/240, uranium-234, uranium-235/236, and uranium-238 are not defined.

Aroclor-1254 was detected at concentrations (maximum 610 mg/kg) above the residential screening level and warrants removal of sediment and tuff in selected areas of SWMU 01-001(f).

A letter was received from NMED, dated May 5, 2009 (NMED 2009, 105858) directing cleanup of the sediment at SWMU 01-001(f) be completed by December 31, 2009. Based on the results of this investigation, the Laboratory is preparing to conduct remediation activities at this site.

6.8.4 Summary of Human Health Risk Screening

Because soil/sediment removal is planned at SWMU 01-001(f), and because the extent of contamination is not defined, no human health risk screening assessment was conducted for SWMU 01-001(f). A human health risk screening assessment will be conducted after sediment/tuff removal is completed and after additional sampling shows that the cleanup was effective and that the extent of contamination is defined.

6.8.5 Summary of Ecological Risk Screening

Because soil/sediment removal is planned at SWMU 01-001(f) and because the extent of contamination is not defined, no ecological risk screening assessment was conducted for this site. An ecological risk screening assessment will be conducted after sediment/tuff removal is completed and after additional sampling shows that the cleanup was effective and that the extent of contamination is defined.

6.9 Site Contamination—SWMU 01-001(g)

6.9.1 Soil, Rock, and Sediment Sampling

A total of 11 samples were collected from 5 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-001(g), septic tank 141. Table 6.9-1 lists the samples collected and the analyses requested for each sample. Figure 6.9-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.9.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.9-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 01-001(g). The sampling locations and detected concentrations are shown in Figure 6.9-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.7.1. The inorganic COPCs identified at SWMU 01-001(g) are antimony, chromium, lead, nickel, nitrate, perchlorate, and selenium.

Organic Chemicals

Table 6.9-3 lists the detected organic chemicals at SWMU 01-001(g). The sampling locations and detected concentrations are shown in Figure 6.9-3.

The identification of organic COPCs is presented in Appendix F, section F-3.7.2. The organic COPCs identified at SWMU 01-001(g) are acetone, Aroclor-1260, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, and methylene chloride.

Radionuclides

Table 6.9-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 01-001(g). The sampling locations and detected concentrations are shown in Figure 6.9-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.7.3. The radionuclide COPCs identified at SWMU 01-001(g) are americium-241, plutonium-239/240, uranium-234, and uranium-235/236.

6.9.3 Nature and Extent of Contamination

The evaluation of nature and extent of contamination at SWMU 01-001(g) is presented in Appendix F, section F-3.7.5. The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined, except

- the vertical extent of chromium and nickel and
- the lateral extent of plutonium-239/240.

The concentrations of plutonium-239/240 in sediment (83.8 pCi/g at location 00-603846 and 189 pCi/g at location 00-603849) exceed its residential screening level and are slightly below the residential screening level in tuff at location 00-603849. Additional sampling is needed to define the extent of plutonium-239/240 and to further evaluate the site to determine if there is any potential unacceptable risk to human health or the environment.

6.9.4 Summary of Human Health Risk Screening

Because the extent of contamination has not been defined at SWMU 01-001(g), no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

6.9.5 Summary of Ecological Risk Screening

Because the extent of contamination has not been defined at SWMU 01-001(g), no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

6.10 Site Contamination—SWMU 01-001(o)

6.10.1 Soil, Rock, and Sediment Sampling

A total of 18 samples were collected from 9 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-001(o), a sanitary waste line. Table 6.10-1 lists the samples collected and the analyses requested for each sample. Figure 6.10-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E. Appendix B details the deviations from the work plan. Hand-auger refusal because of the presence of reinforced concrete in the shallow subsurface resulted in sampling at only one depth at some locations at SWMU 01-001(o).

6.10.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.10-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 01-001(o). The sampling locations and detected concentrations are shown in Figure 6.10-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.8.1. The inorganic COPCs identified at SWMU 01-001(o) are antimony, cadmium, chromium, copper, total cyanide, lead, mercury, nickel, nitrate, perchlorate, selenium, silver, and zinc.

Organic Chemicals

Table 6.10-3 lists the detected organic chemicals at SWMU 01-001(o). The sampling locations and detected concentrations are shown in Figure 6.10-3.

The identification of organic COPCs is presented in Appendix F, section F-3.8.2. The organic COPCs identified at SWMU 01-001(o) are acetone; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; chrysene; di-n-butylphthalate; fluoranthene; methylene chloride; phenanthrene; pyrene; and 1,2,4-trimethylbenzene.

Radionuclides

Table 6.10-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 01-001(o). The sampling locations and detected concentrations are shown in Figure 6.10-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.8.3. The radionuclide COPCs identified at SWMU 01-001(o) are americium-241, cesium-137, plutonium-239/240, strontium-90, and tritium.

6.10.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at SWMU 01-001(o) is presented in Appendix F, section F-3.8.5. The nature and extent of inorganic, organic, and radionuclide COPCs are defined, except

- the vertical extent of chromium, copper, lead, mercury, nickel, silver, and zinc;
- the lateral and vertical extent of Aroclor-1254 and di-n-butylphthalate;
- the lateral and vertical extent of americium-241 and plutonium-239/240; and
- the lateral extent of cesium-137 and strontium-90.

The concentration of Aroclor-1254 (3.2 mg/kg) exceeded the residential screening level at one location. Additional sampling is needed to define the extent of contamination and to further evaluate the site to determine if there is any potential unacceptable risk to human health or the environment.

6.10.4 Summary of Human Health Risk Screening

Because the extent of contamination is not defined at SWMU 01-001(o), no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after the extent of contamination is defined by additional sampling, and after any potential soil removal is conducted.

6.10.5 Summary of Ecological Risk Screening

Because the extent of contamination is not defined at SWMU 01-001(o), no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after the extent of contamination is defined by additional sampling, and after any potential soil removal is conducted.

6.11 Site Contamination—SWMU 01-001(s)

6.11.1 Soil, Rock, and Sediment Sampling

A total of 26 samples were collected from 13 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-001(s), the main western sanitary waste line. Table 6.11-1 lists the samples collected and the analyses requested for each sample. Plate 6.11-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.11.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.11-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 01-001(s). The sampling locations and detected concentrations are shown on Plate 6.11-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.9.1. The inorganic COPCs identified at SWMU 01-001(s) are aluminum, antimony, barium, cadmium, chromium, copper, total cyanide, lead, mercury, nickel, nitrate, perchlorate, and selenium.

Organic Chemicals

Table 6.11-3 lists the detected organic chemicals at SWMU 01-001(s). The sampling locations and detected concentrations are shown on Plate 6.11-3.

The identification of organic COPCs is presented in Appendix F, section F-3.9.2. The organic COPCs identified at SWMU 01-001(s) are acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; chrysene; dibenz(a,h)anthracene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; methylene chloride; naphthalene; phenanthrene; 1-propylbenzene; and pyrene.

Radionuclides

Table 6.11-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 01-001(s). The sampling locations and detected concentrations are shown on Plate 6.11-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.9.3. The radionuclide COPCs identified at SWMU 01-001(s) are plutonium-239/240 and tritium.

6.11.3 Nature and Extent of Contamination

The evaluation of nature and extent of contamination at SWMU 01-001(s) is presented in Appendix F, section F-3.9.5. The lateral and vertical extent of contamination are defined for all inorganic, organic, and radionuclide COPCs, except

- the lateral and vertical extent of barium, copper, lead, and nickel; and
- the vertical extent of plutonium-239/240 and tritium.

6.11.4 Summary of Human Health Risk Screening

Because the extent of contamination has not been defined at SWMU 01-001(s), no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

6.11.5 Summary of Ecological Risk Screening

Because the extent of contamination has not been defined at SWMU 01-001(s), no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

6.12 Site Contamination—SWMU 01-001(t)

6.12.1 Soil, Rock, and Sediment Sampling

A total of 20 samples were collected from 10 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-001(t), the eastern sanitary waste line. Table 6.12-1 lists the samples collected and the analyses requested for each sample. Figure 6.12-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.12.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.12-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BV at SWMU 01-001(t). The sampling locations and detected concentrations are shown in Figure 6.12-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.10.1. The inorganic COPCs identified at SWMU 01-001(t) are arsenic, barium, chromium, copper, total cyanide, lead, nickel, nitrate, and selenium.

Organic Chemicals

Table 6.12-3 lists the detected organic chemicals at SWMU 01-001(t). The sampling locations and detected concentrations are shown in Figure 6.12-3.

The identification of organic COPCs is presented in Appendix F, section F-3.10.2. The organic COPCs identified at SWMU 01-001(t) are acetone, benzyl alcohol, butylbenzylphthalate, and methylene chloride.

Radionuclides

Table 6.12-4 lists the radionuclide detected above BV at SWMU 01-001(t). The sampling locations and detected concentrations are shown in Figure 6.12-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.10.3. The only radionuclide COPC identified at SWMU 01-001(t) is uranium-235/236.

6.12.3 Nature and Extent of Contamination

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined at SWMU 01-001(t). The evaluation of the nature and extent of contamination is presented in Appendix F, section F-3.10.5.

6.12.4 Summary of Human Health Risk Screening

The results of the risk screening assessment for the residential scenario are presented in Appendix G, Tables G-4.2-28, G-4.2-29, Table G-4.2-30, Table G-4.2-31, and G-4.2-32.

The total excess cancer risk for the residential scenario is 4×10^{-6}. This risk is below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HI is 0.07, which is below the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.2 mrem/yr, which is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the residential scenario is equivalent to a total risk of 4×10^{-8}, based on a comparison with EPA's residential PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

For vapor intrusion the total excess cancer risk is approximately 2×10^{-7}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513) and the HI is approximately 0.0003, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the screening assessment results, there is no potential unacceptable risk or dose at SWMU 01-001(t) for the residential scenario.

6.12.5 Summary of Ecological Risk Screening

No potential unacceptable risks are present to ecological receptors at SWMU 01-001(t). Ecological risk screening assessments are presented in Appendix G, section G-5.0.

6.13 Site Contamination—SWMU 01-001(u)

6.13.1 Soil, Rock, and Sediment Sampling

A total of four samples were collected from two locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-001(u), a branch of the western sanitary waste line. Table 6.13-1 lists the samples collected and the analyses requested for each sample. Figure 6.13-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.13.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.13-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 01-001(u). The sampling locations and detected concentrations are shown in Figure 6.13-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.11.1. The inorganic COPCs identified at SWMU 01-001(u) are barium, calcium, copper, total cyanide, lead, and selenium.

Organic Chemicals

Table 6.13-3 lists the detected organic chemicals at SWMU 01-001(u). The sampling locations and detected concentrations are shown in Figure 6.13-3.

The identification of organic COPCs is presented in Appendix F, section F-3.11.2. The organic COPCs identified at SWMU 01-001(u) are acetone, bis(2-ethylhexyl)phthalate, fluoranthene, 4-isopropyltoluene, methylene chloride, pyrene, toluene, and trichlorofluoromethane.

Radionuclides

No radionuclides were detected or detected above BVs/FVs at SWMU 01-001(u), and therefore, no radionuclides are identified as COPCs.

6.13.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at SWMU 01-001(u) is presented in Appendix F, section F-3.11.5. The nature and extent of all inorganic and organic COPCs are defined.

6.13.4 Summary of Human Health Risk Screening

The results of the risk screening assessments for the residential scenario are presented in Appendix G, Tables G-4.2-33, G-4.2-34, G-4.2-35, and G-4.2-36. The total excess cancer risk is approximately 2×10^{-9}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.08, which is less than the NMED target of 1.0 (NMED 2006, 092513). There were no radionuclide COPCs for this site.

For vapor intrusion the total excess cancer risk is approximately 1×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513) and the HI is approximately 0.0003, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the screening assessment results, there is no potential unacceptable risk from COPCs for the residential scenario.

6.13.5 Summary of Ecological Risk Screening

No potential unacceptable risks are present to ecological receptors at SWMU 01-001(u). Ecological risk screening assessments are presented in Appendix G, section G-5.0.

6.14 Site Contamination—SWMU 01-002

6.14.1 Soil, Rock, and Sediment Sampling

A total of 42 samples were collected from 22 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-002, the industrial waste line. Table 6.14-1 lists the samples collected and the analyses requested for each sample. Plate 6.14-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.14.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.14-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 01-002. The sampling locations and detected concentrations are shown on Plate 6.14-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.12.1. The inorganic COPCs identified at SWMU 01-002 are antimony, beryllium, calcium, chromium, copper, total cyanide, lead, mercury, nickel, nitrate, perchlorate, and selenium.

Organic Chemicals

Table 6.14-3 lists the detected organic chemicals at SWMU 01-002. The sampling locations and detected concentrations are shown on Plate 6.14-3.

The identification of organic COPCs is presented in Appendix F, section F-3.12.2. The organic COPCs identified at SWMU 01-002 are acetone, Aroclor-1254, Aroclor-1260, benzene, bis(2-ethylhexyl)phthalate, n-butylbenzene, sec-butylbenzene, tert-butylbenzene, chloroform, isopropylbenzene, 4-isopropyltoluene, methylene chloride, styrene, toluene, trichlorofluoromethane, vinyl chloride, and xylene (total).

Radionuclides

Table 6.14-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 01-002. The sampling locations and detected concentrations are shown on Plate 6.14-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.12.3. The radionuclide COPCs identified at SWMU 01-002 are plutonium-238, plutonium-239/240, tritium, and uranium-235/236.

6.14.3 Nature and Extent of Contamination

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs at SWMU 01-002 are defined. The evaluation of the nature and extent of contamination is presented in Appendix F, section F-3.12.5.

Plutonium-239/-240 was detected at 29.5 and 9.77 pCi/g from 11–12 and 13–14 ft bgs depth intervals, respectively, at location 00-603894. Concentrations decreased with depth at this location. No shallower samples were collected at this location because the presence of fill that was emplaced following extensive removal actions conducted along the industrial waste line during 1976 (Ahlquist et al. 1977, 005710). Plutonium-239/-240 was not detected in the deepest samples at two nearby locations: 8-9 ft bgs at location 00-604531 and 10–11 ft bgs at location 00-603868 [SWMU 01-001(s)]. Plutonium-239/240 was either not detected or was detected at very low concentrations (<0.5 pCi/g) across the site. Therefore, extent is defined for plutonium-239/240 at location 00-603894, and no contaminant transport pathway exists to pose human health or ecological risk.

6.14.4 Summary of Human Health Risk Screening

The results of the risk screening assessment for the residential scenario at SWMU 01-002 are presented in Appendix G, Tables G-4.2-37, G-4.2-38, G-4.2-39, G-4.2-40, and G-4.2-41.

The total excess cancer risk for the residential scenario is 3×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HI is 0.09, which is below the NMED target HI of 1.0 (NMED 2006, 092513).

The total dose is 0.3 mrem/yr and is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the residential scenario is equivalent to a total risk of 1×10^{-6}, based on a comparison with EPA's residential PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

For vapor intrusion the total excess cancer risk is approximately 7×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513) and the HI is approximately 0.0005, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results, there is no potential unacceptable risk or dose under the residential scenario at SWMU 01-002.

6.14.5 Summary of Ecological Risk Screening

No potential unacceptable risks are present to ecological receptors at SWMU 01-002. Ecological risk screening assessments are presented in Appendix G, section G-5.0.

6.15 Site Contamination—SWMU 01-003(a)

6.15.1 Soil, Rock, and Sediment Sampling

A total of 36 samples were collected from 18 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-003(a), Bailey Bridge landfill. Table 6.15-1 lists the samples collected and the analyses requested for each sample. Plate 6.15-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.15.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.15-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 01-003(a). The sampling locations and detected concentrations are shown on Plate 6.15-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.13.1. The inorganic COPCs identified at SWMU 01-003(a) are antimony, arsenic, barium, calcium, chromium, copper, total cyanide, iron, lead, manganese, mercury, nickel, nitrate, perchlorate, selenium, vanadium, and zinc.

Organic Chemicals

Table 6.15-3 lists the detected organic chemicals at SWMU 01-003(a). The sampling locations and detected concentrations are shown on Plate 6.15-3.

The identification of organic COPCs is presented in Appendix F, section F-3.13.2. The organic COPCs identified at SWMU 01-003(a) are acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; chrysene; di-n-butylphthalate; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; naphthalene; phenanthrene; and pyrene.

Radionuclides

Table 6.15-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 01-003(a). The sampling locations and detected concentrations are shown on Plate 6.15-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.13.3. The radionuclide COPCs identified at SWMU 01-003(a) are cesium-134, cesium-137, plutonium-239/240, tritium, uranium-234, uranium-235/236, and uranium-238.

6.15.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at SWMU 01-003(a) is presented in Appendix F, section F-3.13.5. The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined, except

- the lateral and vertical extent of several inorganic COPCs and
- the lateral and vertical extent of plutonium-239/240.

The concentration of Aroclor-1254 (maximum 4.6 mg/kg) exceeds its residential screening level at three locations, and the concentration of lead (10,400 mg/kg) exceeds its residential screening level at one location. Additional sampling is needed to define the extent of contamination and to determine if there is any potential unacceptable risk to human health or the environment.

6.15.4 Summary of Human Health Risk Screening

Because the extent of contamination is not defined and contaminant concentrations warrant soil removal at SWMU 01-003(a), no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after any soil removal is completed and after additional sampling shows that the cleanup was effective and that the extent of contamination is defined.

6.15.5 Summary of Ecological Risk Screening

Because the extent of contamination is not defined and contaminant concentrations warrant soil removal at SWMU 01-003(a), no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after any soil removal is completed and after additional sampling shows that the cleanup was effective and that the extent of contamination is defined.

6.16 Site Contamination—SWMU 01-003(b)

6.16.1 Soil, Rock, and Sediment Sampling

A total of 10 samples were collected from 5 locations and analyzed for inorganic chemicals and radionuclides at SWMU 01-003(b). Organic chemicals were not analyzed, in accordance with the approved work plan (LANL 2006, 091916; NMED 2006, 095460). Table 6.16-1 lists the samples collected and the analyses requested for each sample. Figure 6.16-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.16.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.16-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 01-003(b), a surface disposal area. The sampling locations and detected concentrations are shown in Figure 6.16-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.14.1. The inorganic COPCs identified at SWMU 01-003(b) are aluminum, antimony, arsenic, barium, beryllium, chromium, copper, lead, nickel, nitrate, perchlorate, selenium, and thallium.

Radionuclides

Table 6.16-3 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 01-003(b). The sampling locations and detected concentrations are shown in Figure 6.16-3.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.14.3. The radionuclide COPCs identified at SWMU 01-003(b) are cesium-137, plutonium-238, and plutonium-239/240.

6.16.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at SWMU 01-003(b) is presented in Appendix F, section F-3.14.5. The lateral and vertical extent of all inorganic and radionuclide COPCs are defined, except

- the vertical extent of aluminum, arsenic, barium, beryllium, chromium, copper, lead, nickel, perchlorate, and selenium.

6.16.4 Summary of Human Health Risk Screening

Because the extent of contamination has not been defined at SWMU 01-003(b), no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

6.16.5 Summary of Ecological Risk Screening

Because the extent of contamination has not been defined at SWMU 01-003(b), no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

6.17 Site Contamination—SWMU 01-003(d)

6.17.1 Soil, Rock, and Sediment Sampling

A total of 12 samples were collected from 6 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-003(d), the Can Dump Site. Table 6.17-1 lists the samples collected and the analyses requested for each sample. Figure 6.17-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.17.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.17-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 01-003(d). The sampling locations and detected concentrations are shown in Figure 6.17-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.15.1. The inorganic COPCs identified at SWMU 01-003(d) are antimony, barium, lead, nitrate, perchlorate, selenium, and zinc.

Organic Chemicals

Table 6.17-3 lists the detected organic chemicals at SWMU 01-003(d). The sampling locations and detected concentrations are shown in Figure 6.17-3.

The identification of organic COPCs is presented in Appendix F, section F-3.15.2. The organic COPCs identified at SWMU 01-003(d) are Aroclor-1260, bis(2-ethylhexyl)phthalate, and toluene.

Radionuclides

Table 6.17-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 01-003(d). The sampling locations and detected concentrations are shown in Figure 6.17-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.15.3. The radionuclide COPCs identified at SWMU 01-003(d) are cesium-137 and plutonium-239/240.

6.17.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at SWMU 01-003(d) is presented in Appendix F, section F-3.15.5. The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined, except

- the lateral extent of antimony, barium, lead, and zinc, and
- the lateral and vertical extent of selenium.

Additional sampling is needed to define the extent of contamination and to determine if there is any potential unacceptable risk to human health or the environment.

6.17.4 Summary of Human Health Risk Screening

Because the extent of contamination has not been defined at SWMU 01-003(d), no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

6.17.5 Summary of Ecological Risk Screening

Because the extent of contamination has not been defined at SWMU 01-003(d), no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

6.18 Site Contamination—SWMU 01-003(e)

6.18.1 Soil, Rock, and Sediment Sampling

A total of 14 samples were collected from 10 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-003(e), a surface disposal site. Table 6.18-1 lists the samples collected and the analyses requested for each sample. Figure 6.18-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E. Appendix B details the deviations from the work plan. Hand-auger refusal because of the presence of reinforced concrete in the shallow subsurface resulted in sampling at only one depth at some locations at SWMU 01-003(e).

6.18.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.18-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 01-003(e). The sampling locations and detected concentrations are shown in Figure 6.18-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.16.1. The inorganic COPCs identified at SWMU 01-003(e) are antimony, beryllium, calcium, total cyanide, lead, mercury, nickel, nitrate, perchlorate, selenium, and zinc.

Organic Chemicals

Table 6.18-3 lists the detected organic chemicals at SWMU 01-003(e). The sampling locations and detected concentrations are shown in Figure 6.18-3.

The identification of organic COPCs is presented in Appendix F, section F-3.16.2. The organic COPCs identified at SWMU 01-003(e) are acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; 2-butanone; sec-butylbenzene; chloromethane; chrysene; di-n-butylphthalate; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; methylene chloride; naphthalene; phenanthrene; 1-propylbenzene; pyrene; styrene; tetrachloroethene; toluene; 1,2,4-trimethylbenzene; and 1,3,5-trimethylbenzene.

Radionuclides

Table 6.18-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 01-003(e). The sampling locations and detected concentrations are shown in Figure 6.18-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.16.3. The radionuclide COPCs identified at SWMU 01-003(e) are cesium-137, plutonium-239/240, and tritium.

6.18.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at SWMU 01-003(e) is presented in Appendix F, section F-3.16.5. The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined.

6.18.4 Summary of Human Health Risk Screening

The results of the risk screening assessments for the industrial scenario are presented in Appendix G, Tables G-4.2-42, G-4.2-43, and G-4.2-44. The total excess cancer risk is approximately 2×10^{-6}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.03, which is less than the NMED target of 1.0 (NMED 2006, 092513). The total dose is 0.1 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The results of the risk screening assessments for the recreational scenario are presented in Appendix G, Tables G-4.2-45, G-4.2-46, and G-4.2-47. The total excess cancer risk is approximately 1×10^{-6}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately

0.04, which is less than the NMED target of 1.0 (NMED 2006, 092513). The total dose is 0.04 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The results of the risk screening assessments for the residential scenario are presented in Appendix G, Tables G-4.2-48, G-4.2-49, and G-4.2-50. The total excess cancer risk is approximately 6×10^{-6}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.2, which is less than the NMED target of 1.0 (NMED 2006, 092513). The total dose is 0.7 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The total excess cancer risks for the industrial, recreational, and residential scenarios are 1×10^{-6}, 5×10^{-7}, and 6×10^{-6}, respectively. These risks are below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HIs are 0.03, 0.04, and 0.2, respectively, which are below the NMED target HI of 1.0 (NMED 2006, 092513). The total doses are 0.1 mrem/yr, 0.04 mrem/yr, and 0.7 mrem/yr, respectively, which are below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the industrial scenario is equivalent to a total risk of 5×10^{-6}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the recreational scenario is equivalent to a total risk of 6×10^{-8}, based on conversion from dose using RESRAD, Version 6.21. The total dose for the residential scenario is equivalent to a total risk of 6×10^{-7}, based on a comparison with EPA's residential PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

Based on the screening assessment results, there are no potential unacceptable risks or doses from COPCs for the industrial, recreational, construction worker, and residential scenarios.

6.18.5 Summary of Ecological Risk Screening

No potential unacceptable risks to ecological receptors are present at SWMU 01-002. Ecological risk screening assessments are presented in Appendix G, section G-5.0.

6.19 Site Contamination—SWMU 01-006(a)

6.19.1 Soil, Rock, and Sediment Sampling

A total of 19 samples were collected from 9 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-006(a), a cooling tower drainline and outfall. Table 6.19-1 lists the samples collected and the analyses requested for each sample. Figure 6.19-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.19.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.19-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 01-006(a). The sampling locations and detected concentrations are shown in Figure 6.19-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.17.1. The inorganic COPCs identified at SWMU 01-006(a) are arsenic, calcium chromium, copper, total cyanide, lead, mercury, nickel, nitrate, perchlorate, and selenium.

Organic Chemicals

Table 6.19-3 lists the detected organic chemicals at SWMU 01-006(a). The sampling locations and detected concentrations are shown in Figure 6.19-3.

The identification of organic COPCs is presented in Appendix F, section F-3.17.2. The organic COPCs identified at SWMU 01-006(a) are acetone, Aroclor-1260, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, and methylene chloride.

Radionuclides

Table 6.19-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 01-006(a). The sampling locations and detected concentrations are shown in Figure 6.19-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.17.3. The radionuclide COPCs identified at SWMU 01-006(a) are americium-241, cesium-137, plutonium-239/240, uranium-234, uranium-235/236, and uranium-238.

6.19.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at SWMU 01-006(a) is presented in Appendix F, section F-3.17.5. The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined, except

- the vertical extent of plutonium-239/240 and
- the lateral and vertical extent of uranium-235/236.

Additional sampling is needed to define the extent of plutonium-239/240 and uranium-235/236. After the extent is defined, the site will be further evaluated to determine if there is any potential unacceptable risk to human health or the environment, and if any additional activities are warranted at SWMU 01-006(a).

6.19.4 Summary of Human Health Risk Screening

Because the extent of contamination has not been defined at SWMU 01-006(a), no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

6.19.5 Summary of Ecological Risk Screening

Because the extent of contamination has not been defined at SWMU 01-006(a), no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

6.20 Site Contamination—SWMU 01-006(b)

6.20.1 Soil, Rock, and Sediment Sampling

A total of 11 samples were collected from 5 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-006(b), a drainline and outfall. Table 6.20-1 lists the samples

collected and the analyses requested for each sample. Figure 6.20-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.20.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.20-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BV at SWMU 01-006(b). The sampling locations and detected concentrations are shown in Figure 6.20-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.18.1. The inorganic COPCs identified at SWMU 01-006(b) are antimony, chromium, total cyanide, lead, mercury, nickel, nitrate, perchlorate, and selenium.

Organic Chemicals

Table 6.20-3 lists the detected organic chemicals at SWMU 01-006(b). The sampling locations and detected concentrations are shown in Figure 6.20-3.

The identification of organic COPCs is presented in Appendix F, section F-3.18.2. The organic COPCs identified at SWMU 01-006(b) are Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; chrysene; 4,6-dinitro-2-methylphenol; fluoranthene; 4-isopropyltoluene; methylene chloride; phenanthrene; pyrene; and trichlorofluoromethane.

Radionuclides

Table 6.20-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 01-006(b). The sampling locations and detected concentrations are shown in Figure 6.20-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.18.3. The radionuclide COPCs identified at SWMU 01-006(b) are americium-241 and plutonium-239/240.

6.20.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at SWMU 01-006(b) is presented in Appendix F, section F-3.18.5. The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined, except

- the lateral and vertical extent of americium-241 and plutonium-239/240

The concentration of plutonium-239/240 exceeds the residential screening level at three locations. Additional sampling is needed to define the extent of americium-241 and plutonium-239/240. After extent is defined and soil removal is conducted, the site will be evaluated to determine if there is any potential unacceptable risk to human health or the environment.

6.20.4 Summary of Human Health Risk Screening

Because the extent of contamination is not defined at SWMU 01-006(b), no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after soil removal is completed and after additional sampling shows that the cleanup was effective and that the extent of contamination is defined.

6.20.5 Summary of Ecological Risk Screening

Because the extent of contamination is not defined at SWMU 01-006(b), no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after soil removal is completed and after additional sampling shows that the cleanup was effective and the extent of contamination is defined.

6.21 Site Contamination—SWMU 01-006(c)

6.21.1 Soil, Rock, and Sediment Sampling

A total of two samples were collected from one location and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-006(c), drainlines and outfalls. Table 6.21-1 lists the samples collected and the analyses requested for each sample. Figure 6.21-1 shows the sampling location. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.21.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.21-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 01-006(c). The sampling locations and detected concentrations are shown in Figure 6.21-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.19.1. The inorganic COPCs identified at SWMU 01-006(c) are barium, chromium, cobalt, total cyanide, lead, manganese, nickel, nitrate, perchlorate, selenium, thallium, and zinc.

Organic Chemicals

Table 6.21-3 lists the detected organic chemicals at SWMU 01-006(c). The sampling locations and detected concentrations are shown in Figure 6.21-3.

The identification of organic COPCs is presented in Appendix F, section F-3.19.2. The organic COPCs identified at SWMU 01-006(c) are acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene.

Radionuclides

Table 6.21-4 lists the radionuclide detected above FV and for which FV does not apply at SWMU 01-006(c). The sampling location and detected concentrations are shown in Figure 6.21-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.19.3. The only radionuclide COPC identified at SWMU 01-006(c) is plutonium-239/240.

6.21.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at SWMU 01-006(c) is presented in Appendix F, section F-3.19.5. The lateral and vertical extent of all COPCs are defined, except

- the lateral and vertical extent of chromium and nickel,
- the vertical extent of plutonium-239/240, and
- the vertical extent of organic COPCs.

6.21.4 Summary of Human Health Risk Screening

Because the extent of contamination has not been defined at SWMU 01-006(c), no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

6.21.5 Summary of Ecological Risk Screening

Because the extent of contamination has not been defined at SWMU 01-006(c), no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

6.22 Site Contamination—SWMU 01-006(d)

6.22.1 Soil, Rock, and Sediment Sampling

Two samples were collected from one location and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-006(d), a drainline and outfall. Table 6.22-1 lists the samples collected and the analyses requested for each sample. Figure 6.22-1 shows the sampling location. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.22.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.22-2 lists the inorganic chemicals above BVs at SWMU 01-006(d). The sampling locations and detected concentrations are shown in Figure 6.22-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.20.1. The inorganic COPCs identified at SWMU 01-006(d) are mercury and selenium.

Organic Chemicals

Table 6.22-3 lists the detected organic chemicals at SWMU 01-006(d). The sampling locations and detected concentrations are shown in Figure 6.22-3.

The identification of organic COPCs is presented in Appendix F, section F-3.20.2. The organic COPCs identified at SWMU 01-006(d) are fluoranthene and pyrene.

Radionuclides

No radionuclides were detected or detected above BVs/FVs at SWMU 01-006(d). Therefore, no radionuclides are identified as COPCs.

6.22.3 Nature and Extent of Contamination

No radionuclide COPCs were identified at SWMU 01-006(d). The lateral and vertical extent of all inorganic and organic COPCs are defined. The evaluation of the nature and extent of contamination at SWMU 01-006(d) is presented in Appendix F, section F-3.20.5.

6.22.4 Summary of Human Health Risk Screening

The results of the risk screening assessment for the industrial scenario are presented in Appendix G, Table G-4.2-51. The HI is approximately 0.0004, which is less than the NMED target of 1.0 (NMED 2006, 092513). There were no radionuclide or carcinogenic COPCs for this site.

The results of the risk screening assessment for the recreational scenario are presented in Appendix G, Table G-4.2-52. The HI is approximately 0.0005, which is less than the NMED target of 1.0 (NMED 2006, 092513). There were no radionuclide or carcinogenic COPCs for this site.

The results of the risk screening assessment for the construction worker scenario are presented in Appendix G, Table G-4.2-53. The HI is approximately 0.0001, which is less than the NMED target of 1.0 (NMED 2006, 092513). There were no radionuclide or carcinogenic COPCs for this site.

The results of the risk screening assessment for the residential scenario are presented in Appendix G, Table G-4.2-54. The HI is approximately 0.005, which is less than the NMED target of 1.0 (NMED 2006, 092513). There were no radionuclide or carcinogenic COPCs for this site.

Based on the risk screening assessment results, there are no potential unacceptable risks under the industrial, recreational, construction worker, and residential scenarios.

6.22.5 Summary of Ecological Risk Screening

No potential unacceptable risks are present to ecological receptors at SWMU 01-006(d). Ecological risk screening assessments are presented in Appendix G, section G-5.0.

6.23 Site Contamination—AOC 01-006(e)

6.23.1 Soil, Rock, and Sediment Sampling

A total of six samples were collected from three locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at AOC 01-006(e), drainlines and outfalls to Ashley Pond. Table 6.23-1 lists the samples collected and the analyses requested for each sample. Figure 6.23-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.23.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.23-2 lists the inorganic chemicals above BVs at AOC 01-006(e). The sampling locations and detected concentrations are shown in Figure 6.23-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.21.1. The inorganic COPCs identified at AOC 01-006(e) are barium, chromium, total cyanide, nickel, and selenium.

Organic Chemicals

Table 6.23-3 lists the detected organic chemicals at AOC 01-006(e). The sampling locations and detected concentrations are shown in Figure 6.23-3.

The identification of organic COPCs is presented in Appendix F, section F-3.21.2. The organic COPCs identified at AOC 01-006(e) are acetone and benzyl alcohol.

Radionuclides

No radionuclides were detected or detected above BVs/FVs at AOC 01-006(e).

6.23.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at AOC 01-006(e) is presented in Appendix F, section F-3.21.5. The lateral and vertical extent of all inorganic and organic COPCs at AOC 01-006(e) are defined, except

- the vertical extent of barium, chromium, and nickel.

6.23.4 Summary of Human Health Risk Screening

Because the extent of contamination has not been defined at SWMU 01-006(e), no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

6.23.5 Summary of Ecological Risk Screening

Because the extent of contamination has not been defined at SWMU 01-006(e), no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

6.24 Site Contamination—AOC 01-006(g)

6.24.1 Soil, Rock, and Sediment Sampling

A total of nine samples were collected from four locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at AOC 01-006(g), a stormwater drainage system. Table 6.24-1 lists the samples collected and the analyses requested for each sample. Figure 6.24-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.24.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.24-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at AOC 01-006(g). The sampling locations and detected concentrations are shown in Figure 6.24-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.22.1. The inorganic COPCs identified at AOC 01-006(g) are arsenic, barium, chromium, copper, total cyanide, nickel, nitrate, and perchlorate.

Organic Chemicals

Table 6.24-3 lists the detected organic chemicals at AOC 01-006(g). The sampling locations and detected concentrations are shown in Figure 6.24-3.

The identification of organic COPCs is presented in Appendix F, section F-3.22.2. The organic COPCs identified at AOC 01-006(g) are Aroclor-1260; bis(2-ethylhexyl)phthalate; methylene chloride; and 1,2,4-trimethylbenzene.

Radionuclides

Table 6.24-4 lists the radionuclide detected above the FV and for which the FV does not apply at AOC 01-006(g). The sampling locations and detected concentrations are shown in Figure 6.24-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.22.3. The only radionuclide COPC identified at AOC 01-006(g) is plutonium-239/240.

6.24.3 Nature and Extent of Contamination

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs at AOC 01-006(g) are defined. The evaluation of the nature and extent of contamination at AOC 01-006(g) is presented in Appendix F, section F-3.22.5.

6.24.4 Summary of Human Health Risk Screening

The results of the risk screening assessments for the recreational scenario at AOC 01-006(g) are presented in Appendix G, Tables G-4.2-55, G-4.2-56, and G-4.2-57.

The results of the risk screening assessments for the residential scenario at AOC 01-006(g) are presented in Tables G-4.2-58, G-4.2-59, G-4.2-60, G-4.2-61, and G-4.2-62.

The total excess cancer risk for the recreational and residential scenarios are 2×10^{-6} and 1×10^{-5}, respectively. These risks are below or equivalent to the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HIs are 0.002 and 0.03, which are below the NMED target HI of 1.0 (NMED 2006, 092513). The total doses are 0.08 mrem/yr and 0.5 mrem/yr, respectively, which are below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the recreational scenario is equivalent to a total risk of 3×10^{-8}, based on conversion from dose using RESRAD, Version 6.21. The total dose for the residential scenario is equivalent to a total risk of 4×10^{-7}, based on a comparison with EPA's residential PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

For vapor intrusion the total excess cancer risk is approximately 7×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513) and the HI is approximately 0.0006, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results, there are no potential unacceptable risks or doses under the recreational and residential scenario at AOC 01-006(g).

6.24.5 Summary of Ecological Risk Screening

No potential unacceptable risks are present to ecological receptors at AOC 01-006(g). Ecological risk screening assessments are presented in Appendix G, section G-5.0.

6.25 Site Contamination—SWMU 01-006(h)

Site contamination results for SWMU 01-006(h) are presented along with the results for SWMU 01-001(d) in section 6.6, including summaries of the nature and extent of contamination and risk screening assessments. Site map and sampling locations are shown in Figure 6.6-1. Samples collected and analyses requested are presented in Table 6.6-1. Analytical results for inorganic chemicals, organic chemicals, and radionuclides are shown on Plates 6.6-1, 6.6-2, and 6.6-3 and Tables 6.6-2, 6.6-3, and 6.6-4, respectively.

6.26 Site Contamination—SWMU 01-006(n)

6.26.1 Soil, Rock, and Sediment Sampling

A total of 10 samples were collected from 4 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-006(n). Table 6.26-1 lists the samples collected and the analyses requested for each sample. Figure 6.26-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.26.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.26-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 01-006(n). The sampling locations and detected concentrations are shown in Figure 6.26-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.24.1. The inorganic COPCs identified at SWMU 01-006(n) are chromium, total cyanide, lead, mercury, nickel, nitrate, perchlorate, and selenium.

Organic Chemicals

Table 6.26-3 lists the detected organic chemicals at SWMU 01-006(n). The sampling locations and detected concentrations are shown in Figure 6.26-3.

The identification of organic COPCs is presented in Appendix F, section F-3.24.2. The organic COPCs identified at SWMU 01-006(n) are Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene,

benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, fluoranthene, methylene chloride, phenanthrene, pyrene, and trichlorofluoromethane.

Radionuclides

Table 6.26-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 01-006(n). The sampling locations and detected concentrations are shown in Figure 6.26-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.24.3. The radionuclide COPCs identified at SWMU 01-006(n) are americium-241, cesium-134, plutonium-239/240, and tritium.

6.26.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at SWMU 01-006(n) is presented in Appendix F, section F-3.24.5. The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined, except

- the lateral and vertical extent of plutonium-239/240.

6.26.4 Summary of Human Health Risk Screening

Because the extent of contamination has not been defined at SWMU 01-006(n), no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

6.26.5 Summary of Ecological Risk Screening

Because the extent of contamination has not been defined at SWMU 01-006(n), no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

6.27 Site Contamination—SWMU 01-006(o)

6.27.1 Soil, Rock, and Sediment Sampling

A total of six samples were collected from four locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-006(o), a stormwater drainage system. Table 6.27-1 lists the samples collected and the analyses requested for each sample. Figure 6.27-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E. Appendix B details the deviations from the work plan. Hand-auger refusal because of the presence of reinforced concrete in the shallow subsurface resulted in sampling at only one depth at some locations at SWMU 01-006(o).

6.27.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.27-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 01-006(o). The sampling locations and detected concentrations are shown in Figure 6.27-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.25-1. The inorganic COPCs identified at SWMU 01-006(o) are total cyanide and nitrate.

Organic Chemicals

Table 6.27-3 lists the detected organic chemicals at SWMU 01-006(o). The sampling locations and detected concentrations are shown in Figure 6.27-3.

The identification of organic COPCs is presented in Appendix F, section F-3.25.2. The organic COPCs identified at SWMU 01-006(o) are Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzyl alcohol, bis(2-ethylhexyl)phthalate, chrysene, fluoranthene, phenanthrene, and pyrene.

Radionuclides

Table 6.27-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 01-006(o). The sampling locations and detected concentrations are shown in Figure 6.27-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.25.3. The radionuclide COPCs identified at SWMU 01-006(o) are plutonium-239/240, strontium-90, and tritium.

6.27.3 Nature and Extent of Contamination

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined. The evaluation of the nature and extent of contamination at SWMU 01-006(o) is presented in Appendix F, section F-3.25.5.

6.27.4 Summary of Human Health Risk Screening

The results of the risk screening assessments for the residential scenario at SWMU 01-006(o) are presented in Appendix G, Tables G-4.2-63, G-4.2-64, and G-4.2-65.

The total excess cancer risk for the residential scenario is 2×10^{-6}. This risk is below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HI is 0.3, which is below the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 1.2 mrem/yr, which is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the residential scenario is equivalent to a total risk of 2×10^{-6}, based on a comparison with EPA's residential PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

Based on the risk screening assessment results, there is no potential unacceptable risk or dose under the residential scenario at SWMU 01-006(o).

6.27.5 Summary of Ecological Risk Screening

No potential unacceptable risks are present to ecological receptors at SWMU 01-006(o). Ecological risk screening assessments are presented in Appendix G, section G-5.0.

6.28 Site Contamination—SWMU 01-007(a)

6.28.1 Soil, Rock, and Sediment Sampling

A total of 26 samples were collected from 11 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-007(a), suspected subsurface soil contamination. Table 6.28-1 lists the samples collected and the analyses requested for each sample. Figure 6.28-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.28.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.28-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 01-007(a). The sampling locations and detected concentrations are shown in Figure 6.28-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.26.1. The inorganic COPCs identified at SWMU 01-007(a) are aluminum, antimony, arsenic, beryllium, calcium, chromium, copper, total cyanide, lead, manganese, mercury, nickel, nitrate, perchlorate, and selenium.

Organic Chemicals

Table 6.28-3 lists the detected organic chemicals at SWMU 01-007(a). The sampling locations and detected concentrations are shown in Figure 6.28-3.

The identification of organic COPCs is presented in Appendix F, section F-3.26.2. The organic COPCs identified at SWMU 01-007(a) are acenaphthylene, acetone, anthracene, Aroclor-1254, Aroclor-1260, benzene, benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, benzyl alcohol, bis(2-ethylhexyl)phthalate, tert-butylbenzene, 4-chlorotoluene, chrysene, di-n-butylphthalate, fluoranthene, isopropylbenzene, 4-isopropyltoluene, methylene chloride, phenanthrene, pyrene, tetrachloroethene, trichlorofluoromethane, and xylene (total).

Radionuclides

Table 6.28-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 01-007(a). The sampling locations and detected concentrations are shown in Figure 6.28-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.26.3. The radionuclide COPCs identified at SWMU 01-007(a) are americium-241, cesium-137, plutonium-238, plutonium-239/240, and tritium.

6.28.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at SWMU 01-007(a) is presented in Appendix F, section F-3.26.5. The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined, except

- the vertical extent of chromium and nickel and
- the lateral and vertical extent of bis(2-ethylhexyl)phthalate.

The concentration of plutonium-239/240 (maximum 190 pCi/g) exceeds the residential screening level at two surface locations on the slope at SWMU 01-007(a). After additional sampling is conducted to define the extent of contamination, the site will be evaluated to determine if there is any potential unacceptable risk to human health or the environment and if soil removal is warranted.

6.28.4 Summary of Human Health Risk Screening

Because the extent of contamination is not defined at SWMU 01-007(a), no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after the extent of site COPCs is defined.

6.28.5 Summary of Ecological Risk Screening

Because the extent of contamination is not defined at SWMU 01-007(a), no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after the extent of site COPCs is defined.

6.29 Site Contamination—SWMU 01-007(b)

6.29.1 Soil, Rock, and Sediment Sampling

A total of 32 samples were collected from 16 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-007(b), suspected subsurface soil contamination. Table 6.29-1 lists the samples collected and the analyses requested for each sample. Figure 6.29-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.29.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.29-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 01-007(b). The sampling locations and detected concentrations are shown in Figure 6.29-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.27.1. The inorganic COPCs identified at SWMU 01-007(b) are aluminum, chromium, copper, total cyanide, mercury, nickel, nitrate, perchlorate, and selenium.

Organic Chemicals

Table 6.29-3 lists the detected organic chemicals at SWMU 01-007(b). The sampling locations and detected concentrations are shown in Figure 6.29-3.

The identification of organic COPCs is presented in Appendix F, section F-3.27.2. The organic COPCs identified at SWMU 01-007(b) are Aroclor-1260; bis(2-ethylhexyl)phthalate; chloromethane; di-n-butylphthalate; isopropylbenzene; 4-isopropyltoluene; methylene chloride; toluene; trichlorofluoromethane; and 1,2,4-trimethylbenzene.

Radionuclides

Table 6.29-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 01-007(b). The sampling locations and detected concentrations are shown in Figure 6.29-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.27.3. The radionuclide COPCs identified at SWMU 01-007(b) are americium-241, cesium-137, plutonium-239/240, uranium-234, uranium-235/236, and uranium-238.

6.29.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at SWMU 01-007(b) is presented in Appendix F, section F-3.27.5. The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined, except

- the lateral and vertical extent of chromium, nickel, and selenium and
- the vertical extent of bis(2-ethylhexyl)phthalate.

The concentration of plutonium-239/240 (maximum 242 pCi/g) exceeds the residential screening level at three surface locations on the slope at SWMU 01-007(b). After additional sampling is conducted to define the extent of contamination, the site will be evaluated to determine if there is any potential unacceptable risk to human health or the environment and if soil removal is warranted.

6.29.4 Summary of Human Health Risk Screening

Because the extent of contamination is not defined at SWMU 01-007(b), no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after the extent of site COPCs is defined.

6.29.5 Summary of Ecological Risk Screening

Because the extent of contamination is not defined at SWMU 01-007(b), no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after the extent of site COPCs is defined.

6.30 Site Contamination—SWMU 01-007(c)

6.30.1 Soil, Rock, and Sediment Sampling

A total of eight samples were collected from four locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-007(c), suspected subsurface soil contamination. Table 6.30-1 lists the samples collected and the analyses requested for each sample. Figure 6.30-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.30.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.30-2 lists the inorganic chemicals above BVs at SWMU 01-007(c). The sampling locations and detected concentrations are shown in Figure 6.30-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.28.1. The inorganic COPCs identified at SWMU 01-007(c) are chromium, total cyanide, lead, nickel, nitrate, and selenium.

Organic Chemicals

Table 6.30-3 lists the detected organic chemicals at SWMU 01-007(c). The sampling locations and detected concentrations are shown in Figure 6.30-3.

The identification of organic COPCs is presented in Appendix F, section F-3.28.2. The organic COPCs identified at SWMU 01-007(c) are Aroclor-1260, benzene, n-butylbenzene, sec-butylbenzene, chloroform, 4-isopropyltoluene, styrene, toluene, vinyl chloride, and xylene (total).

Radionuclides

Table 6.30-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 01-007(c). The sampling locations and detected concentrations are shown in Figure 6.30-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.28.3. The radionuclide COPCs identified at SWMU 01-007(c) are plutonium-238, plutonium-239/240, and uranium-235/236.

6.30.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at SWMU 01-007(c) is presented in Appendix F, section F-3.28.5. The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined, except

- the lateral and vertical extent of chromium and nickel.

6.30.4 Summary of Human Health Risk Screening

Because the extent of contamination is not defined at SWMU 01-007(c), no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after the extent of site COPCs is defined.

6.30.5 Summary of Ecological Risk Screening

Because the extent of contamination is not defined at SWMU 01-007(c), no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after the extent of site COPCs is defined.

6.31 Site Contamination—SWMU 01-007(d)

6.31.1 Soil, Rock, and Sediment Sampling

A total of six samples were collected from three locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-007(d), suspected subsurface soil contamination. Table 6.31-1 lists the samples collected and the analyses requested for each sample. Figure 6.31-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.31.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.31-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 01-007(d). The sampling locations and detected concentrations are shown in Figure 6.31-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.29.1. The inorganic COPCs identified at SWMU 01-007(d) are chromium, lead, nickel, nitrate, and selenium.

Organic Chemicals

Table 6.31-3 lists the detected organic chemicals at SWMU 01-007(d). The sampling locations and detected concentrations are shown in Figure 6.31-3.

The identification of organic COPCs is presented in Appendix F, section F-3.29-2. The organic COPCs identified at SWMU 01-007(d) are Aroclor-1260; di-n-octylphthalate; methylene chloride; and 1,2,4-trimethylbenzene.

Radionuclides

No radionuclides were detected or detected above BVs/FVs at SWMU 01-007(d). Therefore, no radionuclides are identified as COPCs.

6.31.3 Nature and Extent of Contamination

The lateral and vertical extent of all inorganic and organic COPCs are defined. The evaluation of the nature and extent of contamination at SWMU 01-007(d) is presented in Appendix F, section F-3.29.5.

6.31.4 Summary of Human Health Risk Screening

The results of the risk screening assessments for the residential scenario at SWMU 01-007(d) are presented in Appendix G, Tables G-4.2-66, G-4.2-67, G-4.2-68, and G-4.2-69.

The total excess cancer risk for the residential scenario is 3×10^{-7}. This risk is below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HI is 0.09, which is below the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide COPCs for this site.

For vapor intrusion the total excess cancer risk is approximately 2×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513) and the HI is approximately 0.002, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results, there is no potential unacceptable risk under the residential scenario at SWMU 01-007(d).

6.31.5 Summary of Ecological Risk Screening

No potential unacceptable risks are present to ecological receptors at SWMU 01-007(d). Ecological risk screening assessments are presented in Appendix G, section G-5.0.

6.32 Site Contamination—SWMU 01-007(e)

6.32.1 Soil, Rock, and Sediment Sampling

A total of four samples were collected from two locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-007(e), suspected subsurface soil contamination. Table 6.32-1 lists the samples collected and the analyses requested for each sample. Figure 6.32-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.32.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.32-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 01-007(e). The sampling locations and detected concentrations are shown in Figure 6.32-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.30.1. The inorganic COPCs identified at SWMU 01-007(e) are barium, calcium, copper, total cyanide, nickel, nitrate, selenium, and silver.

Organic Chemicals

Table 6.32-3 lists the detected organic chemicals at SWMU 01-007(e). The sampling locations and detected concentrations are shown in Figure 6.32-3.

The identification of organic COPCs is presented in Appendix F, section F-3.30.2. The organic COPCs identified at SWMU 01-007(e) are anthracene; Aroclor-1254; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; ethylbenzene; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; pyrene; and trichlorofluoromethane.

Radionuclides

No radionuclides were detected or detected above BVs/FVs at SWMU 01-007(e).

6.32.3 Nature and Extent of Contamination

The lateral and vertical extent of all inorganic and organic COPCs at SWMU 01-007(e) are defined. The evaluation of the nature and extent of contamination at SWMU 01-007(e) is presented in Appendix F, section F-3.30.5.

6.32.4 Summary of Human Health Risk Screening

The results of the risk screening assessments for the residential scenario at SWMU 01-007(e) are presented in Appendix G, Tables G-4.2-70, G-4.2-71, and G-4.2-72.

The total excess cancer risk for the residential scenario is 2×10^{-5}, which is slightly above the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). However, based on the results of the uncertainty analysis (section G-4.3.2), the potential residential risk is overestimated by the exposure point concentration. The risk is equivalent to 1×10^{-5} when the average of the two detected concentrations is used in the risk screening assessment. In addition, no pathway to receptors currently exists at the location where the maximum concentration was detected. The HI is 0.3, which is below the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide COPCs for this site.

For vapor intrusion the HI is approximately 0.000003, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). There are no carcinogenic VOCs detected.

Based on the screening assessment results, there is no potential unacceptable risk under the residential scenario.

6.32.5 Summary of Ecological Risk Screening

No potential unacceptable risks are present to ecological receptors at SWMU 01-007(e). Ecological risk screening assessments are presented in Appendix G, section G-5.0.

6.33 Site Contamination—SWMU 01-007(j)

6.33.1 Soil, Rock, and Sediment Sampling

Two samples were collected from one location and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 01-007(j), suspected subsurface soil contamination. Table 6.33-1 lists the samples collected and the analyses requested for each sample. Figure 6.33-1 shows the sampling location. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.33.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.33-2 lists the inorganic chemicals above BVs at SWMU 01-007(j).

The identification of inorganic COPCs is presented in Appendix F, section F-3.31.1. The inorganic COPC identified at SWMU 01-007(j) is total cyanide.

Organic Chemicals

Table 6.33-3 lists the detected organic chemicals at SWMU 01-007(j). The sampling locations and detected concentrations are shown in Figure 6.33-2.

The identification of organic COPCs is presented in Appendix F, section F-3.31.2. The organic COPCs identified at SWMU 01-007(j) are Aroclor-1254, bis(2-ethylhexyl)phthalate, and di-n-butylphthalate.

Radionuclides

No radionuclides were detected or detected above BVs/FVs at SWMU 01-007(j).

6.33.3 Nature and Extent of Contamination

No radionuclide COPCs were identified at SWMU 01-007(j). The lateral and vertical extent of all inorganic and organic COPCs at SWMU 01-007(j) are defined. The evaluation of the nature and extent of contamination at SWMU 01-007(j) is presented in Appendix F, section F-3.31.5.

6.33.4 Summary of Human Health Risk Screening

The results of the risk screening assessments for the residential scenario are presented in Appendix G, Tables G-4.2-73 and G-4.2-74.

The total excess cancer risk for the residential scenario is 3×10^{-6}. This risk is below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HI is 0.6, which is below the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide COPCs for this site.

Based on the risk screening assessment results, there is no potential unacceptable risk under the residential scenario at SWMU 01-007(j).

6.33.5 Summary of Ecological Risk Screening

No potential unacceptable risks are present to ecological receptors at SWMU 01-007(j). Ecological risk screening assessments are presented in Appendix G, section G-5.0.

6.34 Site Contamination—AOC 01-007(k)

6.34.1 Soil, Rock, and Sediment Sampling

A total of six samples were collected from three locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at AOC 01-007(k), suspected subsurface soil contamination. Table 6.34-1 lists the samples collected and the analyses requested for each sample. Figure 6.34-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

6.34.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.34-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at AOC 01-007(k). The sampling locations and detected concentrations are shown in Figure 6.34-2.

The identification of inorganic COPCs is presented in Appendix F, section F-3.32.1. The inorganic COPCs identified at AOC 01-007(k) are aluminum, barium, chromium, copper, total cyanide, nickel, nitrate, and selenium.

Organic Chemicals

Table 6.34-3 lists the detected organic chemicals at AOC 01-007(k). The sampling locations and detected concentrations are shown in Figure 6.34-3.

The identification of organic COPCs is presented in Appendix F, section F-3.32.2. The organic COPCs identified at AOC 01-007(k) are acetone and methylene chloride.

Radionuclides

Table 6.34-4 lists the radionuclide detected above BV at AOC 01-007(k). The sampling locations and detected concentrations are shown in Figure 6.34-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-3.32.3. The only radionuclide COPC identified at AOC 01-007(k) is uranium-235/236.

6.34.3 Nature and Extent of Contamination

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs at AOC 01-007(k) are defined. The evaluation of the nature and extent of contamination at AOC 01-007(k) is presented in Appendix F, section F-3.32.5

6.34.4 Summary of Human Health Risk Screening

The results of the risk screening assessments for the residential scenario at AOC 01-007(k) are presented in Appendix G, Tables G-4.2-75, G-4.2-76, G-4.2-77, G-4.2-78, and G-4.2-79.

The total excess cancer risk for the residential scenario is 7×10^{-8}. This risk is below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HI is 0.2, which is below the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.2 mrem/yr, which is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the residential scenario is equivalent to a total risk of 9×10^{-7}, based on a comparison with EPA's residential PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

For vapor intrusion the total excess cancer risk is approximately 7×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513) and the HI is approximately 0.00006, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results, there is no potential unacceptable risk or dose under the residential scenario at AOC 01-007(k).

6.34.5 Summary of Ecological Risk Screening

No potential unacceptable risks are present to ecological receptors at AOC 01-007(k). Ecological risk screening assessments are presented in Appendix G, section G-5.0.

6.35 Conclusions—Former TA-01

SWMU 01-001(a)

Additional sampling is necessary to define the lateral and vertical extent of TAL metals and bis(2-ethylhexyl)phthalate. Human health and ecological risk screening assessments will be performed after lateral and vertical extent have been defined.

SWMU 01-001(b)

The nature and extent of all COPCs are defined, and there are no potential unacceptable risks or doses to human health or the environment at the site. Therefore, no further investigation or remediation activities are warranted for SWMU 01-001(b).

SWMU 01-001(c)

The nature and extent of all COPCs are defined, and there are no potential unacceptable risks or doses to human health or the environment at the site. Therefore, no further investigation or remediation activities are warranted for SWMU 01-001(c).

SWMUs 01-001(d) and 01-006(h)

The presence of plutonium-239/240 above a recreational screening level warrants the removal of soil material at SWMUs 01-001(d) and 01-006(h). Additional sampling is also necessary to define the lateral and vertical extent of TAL metals, cesium-137, and plutonium-239/240. Human health and ecological risk screening assessments will be performed after soil removal is completed and the lateral and vertical extent of contamination have been defined.

SWMU 01-001(e)

The nature and extent of all COPCs are defined, and there are no potential unacceptable risks to human health or the environment at the site. Therefore, no further investigation or remediation activities are warranted for SWMU 01-001(e).

SWMU 01-001(f)

The extent of inorganic, organic, and radionuclide COPCs is not defined, and Aroclor-1254 was detected at concentrations that warrant removal of sediment and tuff at SWMU 01-001(f). Human health and ecological risk screening assessments will be performed after sediment and tuff removal is completed and the lateral and vertical extent of contamination have been defined.

SWMU 01-001(g)

Additional sampling is necessary to define the vertical extent of chromium and nickel and the lateral extent of plutonium-239/240 at SWMU 01-001(g). Human health and ecological risk screening assessments will be performed after the lateral and vertical extent of contamination have been defined.

SWMU 01-001(o)

Additional sampling is necessary to define the extent of TAL metals, Aroclor-1254, di-n-butylphthalate, americium-241, cesium-137, plutonium-239/240, and strontium-90. The concentration of Aroclor-1254

warrants limited soil removal in a portion of SWMU 01-001(o). Human health and ecological risk screening assessments will be performed after any soil removal is completed and the lateral and vertical extent of contamination have been defined.

SWMU 01-001(s)

Additional sampling is necessary to define the lateral and vertical extent of TAL metals and vertical extent of plutonium-239/240 and tritium at SWMU 01-001(s). Human health and ecological risk screening assessments will be performed after the lateral and vertical extent of contamination have been defined.

SWMU 01-001(t)

The nature and extent of all COPCs are defined, and there are no potential unacceptable risks or doses to human health or the environment at the site. Therefore, no further investigation or remediation activities are warranted for SWMU 01-001(t).

SWMU 01-001(u)

The nature and extent of all COPCs are defined, and there are no potential unacceptable risks to human health or the environment at the site. Therefore, no further investigation or remediation activities are warranted for SWMU 01-001(u).

SWMU 01-002

The nature and extent of all COPCs are defined, and there are no potential unacceptable risks or doses to human health or the environment at the site. Therefore, no further investigation or remediation activities are warranted for SWMU 01-002.

SWMU 01-003(a)

Additional sampling is necessary to define the lateral and vertical extent of TAL metals and plutonium-239/240 at SWMU 01-003(a). The concentrations of Aroclor-1254 and lead warrant limited soil removal in portions of the site. Human health and ecological risk screening assessments will be performed after soil removal is completed and the lateral and vertical extent of contamination have been defined.

SWMU 01-003(b)

Additional sampling is necessary to define the lateral and vertical extent of TAL metals and perchlorate. Human health and ecological risk screening assessments will be performed after the lateral and vertical extent of contamination have been defined.

SWMU 01-003(d)

Additional sampling is necessary to define the extent of TAL metals at SWMU 01-003(d). Human health and ecological risk screening assessments will be performed after the extent of contamination has been defined.

SWMU 01-003(e)

The nature and extent of all COPCs are defined, and there are no potential unacceptable risks or doses to human health or the environment at the site. Therefore, no further investigation or remediation activities are warranted for SWMU 01-003(e).

SWMU 01-006(a)

Additional sampling is necessary to define the vertical extent of plutonium-239/240 and the lateral and vertical extent of uranium-235/236. Human health and ecological risk screening assessments will be performed after soil removal is completed and the lateral and vertical extent of contamination have been defined.

SWMU 01-006(b)

Additional sampling is necessary to define the lateral and vertical extent of americium-241 and plutonium-239/240 at SWMU 01-006(b). Concentrations of plutonium-239/240 exceed the residential screening level at three locations and warrant the removal of soil. Human health and ecological risk screening assessments will be performed after soil removal is completed and the lateral extent of contamination has been defined.

SWMU 01-006(c)

Additional sampling is necessary to define the lateral and vertical extent of chromium and nickel, the vertical extent of organic COPCs, and the vertical extent of plutonium-239/240. Human health and ecological risk screening assessments will be performed after the lateral and vertical extent of contamination have been defined.

SWMU 01-006(d)

The nature and extent of all COPCs are defined, and there are no potential unacceptable risks to human health or the environment at the site. Therefore, no further investigation or remediation activities are warranted for SWMU 01-006(d).

AOC 01-006(e)

Additional sampling is necessary to define the vertical extent of barium, chromium, and nickel. Human health and ecological risk screening assessments will be performed after the lateral and vertical extent of contamination have been defined.

AOC 01-006(g)

The nature and extent of all COPCs are defined, and there are no potential unacceptable risks or doses to human health or the environment at the site. Therefore, no further investigation or remediation activities are warranted for AOC 01-006(g).

SWMUs 01-006(h) and 01-001(d)

The presence of plutonium-239/240 above a recreational screening level warrants the removal of soil material at SWMUs 01-006(h) and 01-001(d). Additional sampling is also necessary to define the lateral and vertical extent of TAL metals, cesium-137, and plutonium-239/240. Human health and ecological risk

screening assessments will be performed after soil removal is completed and the lateral and vertical extent of contamination have been defined.

SWMU 01-006(n)

Additional sampling is necessary to define the lateral and vertical extent of plutonium-239/240. Human health and ecological risk screening assessments will be performed after the lateral and vertical extent of contamination have been defined.

SWMU 01-006(o)

The nature and extent of all COPCs are defined, and there are no potential unacceptable risks or doses to human health or the environment at the site. Therefore, no further investigation or remediation activities are warranted for SWMU 01-006(o).

SWMU 01-007(a)

Additional sampling is necessary to define the vertical extent of chromium and nickel and the lateral and vertical extent of bis(2-ethylhexyl)phthalate. The concentration of plutonium-239/240 exceeds the residential screening level at two surface locations on the slope at SWMU 01-007(a). After additional sampling is conducted to define the extent of contamination, the site will be evaluated to determine if there is any potential unacceptable risk to human health or the environment and if soil removal is warranted.

SWMU 01-007(b)

Additional sampling is necessary to define the lateral and vertical extent of chromium, nickel, selenium, and bis(2-ethylhexyl)phthalate. The concentration of plutonium-239/240 exceeds the residential screening level at three surface locations on the slope at SWMU 01-007(b). After additional sampling is conducted to define the extent of contamination, the site will be evaluated to determine if there is any potential unacceptable risk to human health or the environment and if soil removal is warranted.

SWMU 01-007(c)

Additional sampling is necessary to define the lateral and vertical extent of chromium and nickel. Human health and ecological risk screening assessments will be performed after the lateral and vertical extent of contamination have been defined.

SWMU 01-007(d)

The nature and extent of all COPCs are defined, and there are no potential unacceptable risks to human health or the environment at the site. Therefore, no further investigation or remediation activities are warranted for SWMU 01-007(d).

SWMU 01-007(e)

The nature and extent of all COPCs are defined, and there are no potential unacceptable risks to human health or the environment at the site. Therefore, no further investigation or remediation activities are warranted for SWMU 01-007(e).

SWMU 01-007(j)

The nature and extent of all COPCs are defined, and there are no potential unacceptable risks to human health or the environment at the site. Therefore, no further investigation or remediation activities are warranted for SWMU 01-007(j).

AOC 01-007(k)

The nature and extent of all COPCs are defined, and there are no potential unacceptable risks to human health or the environment at the site. Therefore, no further investigation or remediation activities are warranted for AOC 01-007(k).

7.0 TA-03 SITE INVESTIGATIONS

Four sites at TA-03 were sampled (Table 1.1-1) as directed by the investigation work plan (LANL 2006, 091916), NMED's approval with modifications (NMED 2006, 095460), and subsequent communication from NMED (Dhawan 2007, 105594). Deviations from the work plan are described in Appendix B.

7.1 Field Investigation Results—TA-03

7.1.1 Surface Conditions

TA-03 comprises the core operational and administrative complex of the Laboratory. It is highly developed with numerous office and laboratory buildings, parking facilities, roads, and other paved areas. Most of TA-03 is located on the mesa-top south of Los Alamos Canyon, but limited portions extend into the canyons. The canyon areas of TA-03 are less developed but are within Laboratory boundaries.

7.1.2 Exploratory Drilling or Excavation Investigations

No exploratory drilling or excavation was conducted at the TA-03 sites. All drilling was performed for the purpose of collecting investigation samples.

7.1.3 Subsurface Conditions

The rock units encountered at and below the surface during the investigation of the TA-03 sites were units 3 and 1g of the Tshirege Member of the Bandelier Tuff (Qbt 3 and Qbt 1g). These units are briefly described in section 5.1.3.

The stratigraphy of the Upper Los Alamos Canyon Aggregate Area is described in more detail in the approved work plan (LANL 2006, 091916; NMED 2006, 095460).

The only known subsurface structures currently at the TA-03 sites are utilities, which were marked out before sampling began.

7.1.4 Groundwater Conditions

All TA-03 sites investigated are located on the mesa-top to the south of Los Alamos Canyon. For mesa-top sites of the Upper Los Alamos Canyon Aggregate Area, the surface is separated from the regional aquifer by an unsaturated zone that is approximately 1000 to 1300 ft thick (Figure 5.1-1). Groundwater monitoring is currently performed at the Laboratory through an integrated sitewide groundwater monitoring program (LANL 2008, 101897). Plate 2.1-1 shows the locations of all groundwater monitoring

wells in the vicinity of TA-03. No groundwater sampling or other groundwater investigations were included in the scope of this investigation.

7.1.5 Surface Water Conditions

No natural permanent surface water is present at the mesa-top sites of the Upper Los Alamos Canyon Aggregate Area. During summer thunderstorms and spring snowmelt, runoff may flow from the mesa-top onto the hillsides (canyon slopes) of Los Alamos Canyon. Seasonal flow occurs in the main channel of Los Alamos Canyon in response to spring snowmelt or summer thunderstorms.

No surface water sampling or other surface water investigations were included in the scope of this investigation.

7.2 Field-Screening Results—TA-03

No organic vapors were detected at more than 10 ppm above ambient air during PID screening of subsurface cores. No radiological screening results exceeded twice the daily site background levels. Field-screening results for TA-03 sites are presented in Table 4.5-1. There were no changes to sampling or other activities as a result of field-screening results.

No field screening was performed during the sampling of SWMU 03-055(c) because VOCs were not expected to be present in highly disturbed sediments and because radionuclides were not expected to be present at the site. This deviation from the approved work plan is described in Appendix B, section B-8.0.

7.3 Site Contamination—SWMU 03-009(j)

7.3.1 Soil, Rock, and Sediment Sampling

Four samples were collected from two locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 03-009(j), a surface disposal site. Table 7.3-1 lists the samples collected and the analyses requested for each sample. Figure 7.3-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

7.3.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 7.3-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BV at SWMU 03-009(j). The sampling locations and detected concentrations are shown in Figure 7.3-2.

The identification of inorganic COPCs is presented in Appendix F, section F-4.1.1. The inorganic COPCs identified at SWMU 03-009(j) are aluminum, calcium, chromium, total cyanide, lead, nickel, nitrate, and selenium.

Organic Chemicals

No organic chemicals were detected at SWMU 03-009(j).

Radionuclides

No radionuclides were detected or detected above BVs/FVs at SWMU 03-009(j).

7.3.3 Nature and Extent of Contamination

No organic or radionuclide COPCs were identified at SWMU 03-009(j). The lateral and vertical extent of all inorganic COPCs at SWMU 03-009(j) are defined. The evaluation of the nature and extent of contamination at SWMU 03-009(j) is presented in Appendix F, section F-4.1.5.

7.3.4 Summary of Human Health Risk Screening

The results of the risk screening assessment for the industrial scenario at SWMU 03-009(j) are presented in Appendix G, Tables G-4.2-80 and G-4.2-81.

The results of the risk screening assessment for the recreational scenario are presented in Appendix G, Table G-4.2-82.

The results of the risk screening assessment for the residential scenario are presented in Appendix G, Tables G-4.2-83 and G-4.2-84.

The total excess cancer risk for the industrial and residential scenarios are 1×10^{-8} and 7×10^{-8}, respectively, which are below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HIs for the industrial, recreational, and residential scenarios are 0.1, 0.1, and 0.2, respectively, which are below the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide COPCs for this site.

Based on the risk screening assessment results, there are no potential unacceptable risks under the industrial, recreational, and residential scenarios at SWMU 03-009(j).

7.3.5 Summary of Ecological Risk Screening

No potential unacceptable risks are present to ecological receptors at SWMU 03-009(j). Ecological risk screening assessments are presented in Appendix G, section G-5.0.

7.4 Site Contamination—SWMUs 03-038(a) and 03-038(b)

7.4.1 Soil, Rock, and Sediment Sampling

A total of 18 samples were collected from 6 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMUs 03-038(a) and 03-038(b), acid tanks. Table 7.4-1 lists the samples collected and the analyses requested for each sample. Figure 7.4-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

7.4.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 7.4-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMUs 03-038(a) and 03-038(b). The sampling locations and detected concentrations are shown in Figure 7.4-2.

The identification of inorganic COPCs is presented in Appendix F, section F-4.2.1. The inorganic COPCs identified at SWMUs 03-038(a) and 03-038(b) are antimony, barium, chromium, copper, cyanide (total), lead, nickel, nitrate, perchlorate, and selenium.

Organic Chemicals

Table 7.4-3 lists the detected organic chemicals at SWMUs 03-038(a) and 03-038(b). The sampling locations and detected concentrations are shown in Figure 7.4-3.

The identification of organic COPCs is presented in Appendix F, section F-4.2.2. The organic COPCs identified at SWMUs 03-038(a) and 03-038(b) are Aroclor-1254; Aroclor-1260; benzo(a)pyrene; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; chrysene; dibenz(a,h)anthracene; fluoranthene; 2-hexanone; indeno(1,2,3-cd)pyrene; phenanthrene; pyrene; and toluene.

Radionuclides

No radionuclides were detected or detected above BVs/FVs at SWMUs 03-038(a) and 03-038(b).

7.4.3 Nature and Extent of Contamination

No radionuclide COPCs were identified at SWMUs 03-038(a) and 03-038(b). The evaluation of the nature and extent of contamination at SWMUs 03-038(a) and 03-038(b) is presented in Appendix F, section F-4.2.5. The lateral and vertical extent of all inorganic and organic COPCs are defined, except

- the vertical extent of barium, chromium, copper, lead, and nickel and the lateral extent of barium.

7.4.4 Summary of Human Health Risk Screening

Because the extent of contamination is not defined at SWMUs 03-038(a) and 03-038(b), no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after the extent of site COPCs is defined.

7.4.5 Summary of Ecological Risk Screening

Because the extent of contamination is not defined at SWMUs 03-038(a) and 03-038(b), no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after the extent of site COPCs is defined.

7.5 Site Contamination—SWMU 03-055(c)

7.5.1 Soil, Rock, and Sediment Sampling

A total of 20 samples were collected from 10 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 03-055(c), an outfall. Table 7.5-1 lists the samples collected and the analyses requested for each sample. Figure 7.5-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E. Deviations from the work plan at SWMU 03-055(c) are described in Appendix B, section B-8.0.

7.5.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 7.5-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 03-055(c). The sampling locations and detected concentrations are shown in Figure 7.5-2.

The identification of inorganic COPCs is presented in Appendix F, section F-4.3.1. The inorganic COPCs identified at SWMU 03-055(c) are arsenic, cadmium, copper, total cyanide, lead, nitrate, selenium, and zinc.

Organic Chemicals

Table 7.5-3 lists the detected organic chemicals at SWMU 03-055(c). The sampling locations and detected concentrations are shown on Plate 7.5-1.

The identification of organic COPCs is presented in Appendix F, section F-4.3.2. The organic COPCs identified at SWMU 03-055(c) are acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; 2-butanone; chrysene; dibenzofuran; ethylbenzene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; toluene; trichlorofluoromethane; 1,2-xylene; and 1,3-xylene+1,4-xylene.

Radionuclides

Table 7.5-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 03-055(c).

The identification of radionuclide COPCs is presented in Appendix F, section F-4.3.3. No radionuclide COPCs are identified at SWMU 03-055(c).

7.5.3 Nature and Extent of Contamination

No radionuclide COPCs are identified at SWMU 03-055(c). The evaluation of the nature and extent of contamination at SWMU 03-055(c) is presented in Appendix F, section F-4.3.5. The lateral and vertical extent of all inorganic and organic COPCs are defined, except

- the vertical extent of zinc.

7.5.4 Summary of Human Health Risk Screening

Because the extent of contamination is not defined at SWMU 03-055(c), no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after the extent of site COPCs is defined.

7.5.5 Summary of Ecological Risk Screening

Because the extent of contamination is not defined at SWMU 03-055(c), no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after the extent of site COPCs is defined.

7.6 Conclusions—TA-03

SWMU 03-009(j)

The nature and extent of all COPCs are defined, and there are no potential unacceptable risks to human health or the environment at the site. Therefore, no further investigation or remediation activities are warranted for SWMU 03-009(j).

SWMUs 03-038(a) and 03-038(b)

Additional sampling is necessary to define the vertical extent of barium, chromium, copper, lead, and nickel and the lateral extent of barium. Human health and ecological risk screening assessments will be performed after the lateral and vertical extent of contamination have been defined.

SWMU 03-055(c)

Additional sampling is necessary to define the vertical extent of zinc. Human health and ecological risk screening assessments will be performed after the lateral and vertical extent of contamination have been defined.

8.0 FORMER TA-32 SITE INVESTIGATIONS

Five sites at former TA-32 were sampled (Table 1.1-1) according to the work plan (LANL 2006, 091916) and NMED's approval with modifications (NMED 2006, 095460).

8.1 Field Investigation Results—Former TA-32

8.1.1 Surface Conditions

Former TA-32 is located within the Los Alamos townsite south of Trinity Drive and extends southward onto the north slope of Los Alamos Canyon (Plate 2.1-1). The mesa-top portion is a developed area that includes commercial properties and industrial facilities owned by Los Alamos County. This area is almost entirely paved or covered by buildings. The canyon-slope area is undeveloped and largely unusable because of the steepness of the slope.

Much of the area investigated at former TA-32 is currently used by Los Alamos County for stockpiling asphalt, road salt, and other material for roadwork and other projects. In this capacity, significant disturbance to the sites occurred over a number of years before this investigation was conducted. This disturbance included regrading, excavating, and backfilling. Figure 8.1-1 shows recent site conditions.

8.1.2 Exploratory Drilling or Excavation Investigations

No exploratory drilling or excavation was conducted at the TA-32 sites. All drilling was performed for the purpose of collecting investigation samples.

8.1.3 Subsurface Conditions

The rock units encountered at and below the surface during investigation of the TA-32 sites were units 3 and 1g of the Tshirege Member of the Bandelier Tuff (Qbt 3 and Qbt 1g). These units are briefly described in section 5.1.3.

The stratigraphy of the Upper Los Alamos Canyon Aggregate Area is described in more detail in the work plan (LANL 2006, 091916).

Subsurface structures encountered included numerous utilities (which were marked out before the beginning of sampling). The known utility lines are shown on the site map and the figures showing the sampling locations for each site.

8.1.4 Groundwater Conditions

For mesa-top sites of the Upper Los Alamos Canyon Aggregate Area, the surface is separated from the regional aquifer by an unsaturated zone that is approximately 1000 to 1300 ft thick (Figure 5.1-1). Sampling locations near the bottom of Los Alamos Canyon are approximately 700 ft or more above the regional aquifer. Alluvial groundwater may be present in Los Alamos Canyon in the region of the Upper Los Alamos Canyon Aggregate Area. Groundwater monitoring is currently performed at the Laboratory through an integrated sitewide groundwater monitoring program (LANL 2008, 101897). Plate 2.1-1 shows the locations of all groundwater monitoring wells in the vicinity of former TA-32. No groundwater sampling or other groundwater investigations were included in the scope of this investigation.

8.1.5 Surface Water Conditions

No natural permanent surface water is present at the mesa-top sites of the Upper Los Alamos Canyon Aggregate Area. During summer thunderstorms and spring snowmelt, runoff may flow from the mesa-top onto the hillsides (canyon slopes) of Los Alamos Canyon. Seasonal flow occurs in the main channel of Los Alamos Canyon in response to spring snowmelt or summer thunderstorms.

No surface water sampling or other surface water investigations were included in the scope of this investigation.

8.2 Field-Screening Results—Former TA-32

No organic vapors were detected at more than 10 ppm above ambient air during PID screening of subsurface cores. No radiological screening results exceeded twice the daily site background levels. Field-screening results for former TA-32 are presented in Table 4.5-1. There were no changes to sampling or other activities as a result of field-screening results.

8.3 Site Contamination—SWMU 32-001

8.3.1 Soil, Rock, and Sediment Sampling

A total of 12 samples were collected from 7 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 32-001, a former incinerator. Table 8.3-1 lists the samples collected and the analyses requested for each sample. Figure 8.3-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

8.3.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 8.3-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 32-001. The sampling locations and detected concentrations are shown in Figure 8.3-2.

The identification of inorganic COPCs is presented in Appendix F, section F-5.1.1. The inorganic COPCs identified at SWMU 32-001 are antimony, barium, calcium, chromium, cobalt, copper, total cyanide, mercury, nickel, nitrate, perchlorate, selenium, silver, and zinc.

Organic Chemicals

Table 8.3-3 lists the detected organic chemicals at SWMU 32-001. The sampling locations and detected concentrations are shown in Figure 8.3-3.

The identification of organic COPCs is presented in Appendix F, section F-5.1.2. The organic COPCs identified at SWMU 32-001 are acetone; Aroclor-1260; bis(2-ethylhexyl)phthalate; cis-1,2-dichloroethene; methylene chloride; phenanthrene; tetrachloroethene; trichloroethene; and dioxins and furans (1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; total tetrachlorodibenzodioxins; total tetrachlorodibenzofurans).

Radionuclides

Table 8.3-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 32-001. The sampling locations and detected concentrations are shown in Figure 8.3-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-5.1.3. The radionuclide COPCs identified at SWMU 32-001 are plutonium-239/240 and strontium-90.

8.3.3 Nature and Extent of Contamination

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs at SWMU 32-001 are defined. The evaluation of the nature and extent of contamination at SWMU 32-001 is presented in Appendix F, section F-5.1.5.

8.3.4 Summary of Human Health Risk Screening

The results of the risk screening assessment for the industrial scenario at SWMU 32-001 are presented in Appendix G, Tables G-4.2-86 and G-4.2-87.

The results of the risk screening assessment for the construction worker scenario are presented in Appendix G, Tables G-4.2-89, G-4.2-90, and G-4.2-91.

The results of the risk screening assessment for the residential scenario are presented in Appendix G, Tables G-4.2-92, G-4.2-93, G-4.2-94, G-4.2-95, and G-4.2-96.

The total excess cancer risk for the industrial, construction worker, and residential scenarios are 2×10^{-7}, 5×10^{-6}, and 8×10^{-7}, respectively, which are below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HIs are 0.005, 0.1, and 0.04, are below the NMED target HI of 1.0 (NMED 2006, 092513). No radionuclide COPCs were detected from 0–1 ft. Therefore, no industrial screening was conducted. The total doses for the construction worker and residential scenarios are 0.03 mrem/yr and 0.7 mrem/yr, respectively, which are below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the construction worker scenario is equivalent to a total risk of 6×10^{-8}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the residential scenario is equivalent to a total risk of 1×10^{-6}, based on a comparison with EPA's residential PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

For vapor intrusion the total excess cancer risk is approximately 1×10^{-6}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513) and the HI is approximately 0.0006, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results, there are no potential unacceptable risks or doses under the industrial, construction worker, and residential scenarios at SWMU 32-001.

8.3.5 Summary of Ecological Risk Screening

No potential unacceptable risks are present to ecological receptors at SWMU 32-001. Ecological risk screening assessments are presented in Appendix G, section G-5.0.

8.4 Site Contamination—SWMU 32-002(a)

8.4.1 Soil, Rock, and Sediment Sampling

A total of 31 samples were collected from 21 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 32-002(a), a septic system. Table 8.4-1 lists the samples collected and the analyses requested for each sample. Plate 8.4-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

8.4.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 8.4-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 32-002(a). The sampling locations and detected concentrations are shown on Plate 8.4-2.

The identification of inorganic COPCs is presented in Appendix F, section F-5.2.1. The inorganic COPCs identified at SWMU 32-002(a) are antimony, arsenic, barium, beryllium, cadmium, chromium, copper, total cyanide, iron, lead, mercury, nickel, nitrate, perchlorate, selenium, silver, sodium, thallium, and zinc.

Organic Chemicals

Table 8.4-3 lists the detected organic chemicals at SWMU 32-002(a). The sampling locations and detected concentrations are shown on Plate 8.4-3.

The identification of organic COPCs is presented in Appendix F, section F-5.2.2. The organic COPCs identified at SWMU 32-002(a) are Aroclor-1260; acetone; acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; carbazole; chrysene; dibenz(a,h)anthracene; dibenzofuran; dichlorodifluoromethane; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; methylene chloride; naphthalene; phenanthrene; pyrene; trichlorofluoromethane; and dioxins and furans (1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans).

Radionuclides

Table 8.4-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 32-002(a). The sampling locations and detected concentrations are shown on Plate 8.4-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-5.2.3. The radionuclide COPCs identified at SWMU 32-002(a) are cesium-137, plutonium-238, plutonium-239/240, tritium, and uranium-235/236.

8.4.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at SWMU 32-002(a) is presented in Appendix F, section F-5.2.5. The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined, except

- the vertical extent of barium, chromium, and nickel.

The concentration of lead (maximum 530 mg/kg) and arsenic (13 mg/kg) exceed the residential SSLs at one location. Additional sampling is needed to define the extent of contamination. After the extent is defined, the site will be further evaluated to determine if there is any potential unacceptable risk to human health or the environment, and if soil removal is warranted.

8.4.4 Summary of Human Health Risk Screening

Because the extent of contamination has not been defined at SWMU 32-002(a), no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

8.4.5 Summary of Ecological Risk Screening

Because the extent of contamination has not been defined at SWMU 32-002(a), no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

8.5 Site Contamination—SWMU 32-002(b)

8.5.1 Soil, Rock, and Sediment Sampling

A total of 38 samples were collected from 25 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 32-002(b), a septic system. Table 8.5-1 lists the samples collected and the analyses requested for each sample. Plate 8.4-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

8.5.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 8.5-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 32-002(b). The sampling locations and detected concentrations are shown on Plate 8.4-2.

The identification of inorganic COPCs is presented in Appendix F, section F-5.3.1. The inorganic COPCs identified at SWMU 32-002(b) are antimony, arsenic, barium, chromium, copper, total cyanide, lead, manganese, mercury, nickel, nitrate, perchlorate, selenium, silver, thallium, and zinc.

Organic Chemicals

Table 8.5-3 lists the detected organic chemicals at SWMU 32-002(b). The sampling locations and detected concentrations are shown on Plate 8.4-3.

The identification of organic COPCs is presented in Appendix F, section F-5.3.2. The organic COPCs identified at SWMU 32-002(b) are Aroclor-1260; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; carbazole; chrysene; di-n-butylphthalate; dibenz(a,h)anthracene; fluoranthene; indeno(1,2,3-cd)pyrene; methylene chloride; phenanthrene; pyrene; tetrachloroethene; trichlorofluoromethane; and dioxins and furans (1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; total tetrachlorodibenzofurans).

Radionuclides

Table 8.5-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 32-002(b). The sampling locations and detected concentrations are shown on Plate 8.4-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-5.3.3. The radionuclide COPCs identified at SWMU 32-002(b) are americium-241, cesium-137, plutonium-239/240, strontium-90, tritium, uranium-234, uranium-235/236, and uranium-238.

8.5.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at SWMU 32-002(b) is presented in Appendix F, section F-5.3.5. The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined, except

- the vertical extent of barium and
- the lateral and vertical extent of chromium and nickel.

Concentrations of arsenic (maximum 7.5 mg/kg) exceeded the residential screening level at three locations. Additional sampling is needed to define the extent of contamination. After extent is defined, the site will be further evaluated to determine if there is any potential unacceptable risk to human health or the environment and if soil removal is warranted.

8.5.4 Summary of Human Health Risk Screening

Because the extent of contamination has not been defined at SWMU 32-002(b), no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

8.5.5 Summary of Ecological Risk Screening

Because the extent of contamination has not been defined at SWMU 32-002(b), no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

8.6 Site Contamination—AOC 32-003

8.6.1 Soil, Rock, and Sediment Sampling

A total of 24 samples were collected from 12 locations and analyzed for TAL metals, PCBs, SVOCs, and VOCs at AOC 32-003, a former transformer site. Table 8.6-1 lists the samples collected and the analyses requested for each sample. Figure 8.6-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

8.6.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 8.6-2 lists the inorganic chemicals above BVs at AOC 32-003. The sampling locations and detected concentrations are shown in Figure 8.6-2.

The identification of inorganic COPCs is presented in Appendix F, section F-5.4.1. The inorganic COPCs identified at AOC 32-003 are antimony, beryllium, chromium, copper, nickel, selenium, sodium, and zinc.

Organic Chemicals

Table 8.6-3 lists the detected organic chemicals at AOC 32-003. The sampling locations and detected concentrations are shown in Figure 8.6-3.

The identification of organic COPCs is presented in Appendix F, section F-5.4.2. The organic COPCs identified at AOC 32-003 are Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; methylene chloride; phenanthrene; and pyrene.

8.6.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at AOC 32-003 is presented in Appendix F, section F-5.4.5. The lateral and vertical extent of all inorganic and organic COPCs are defined, except

- the lateral extent of Aroclor-1260 and
- the lateral and vertical extent of PAHs.

Concentrations of Aroclor-1260 (maximum 26 mg/kg) exceeded the residential screening level at two locations, warranting limited soil removal. After soil removal and additional extent sampling are conducted, the site will be evaluated to determine if there is any potential unacceptable risk to human health or the environment.

8.6.4 Summary of Human Health Risk Screening

Because the extent of contamination has not been defined at AOC 32-003, no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted following soil removal and additional investigation activities.

8.6.5 Summary of Ecological Risk Screening

Because the extent of contamination has not been defined at AOC 32-003, no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted following soil removal and additional investigation activities.

8.7 Site Contamination—AOC 32-004

8.7.1 Soil, Rock, and Sediment Sampling

A total of 12 samples were collected from 8 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at AOC 32-004, a drainline and outfall. Table 8.7-1 lists the samples collected and the analyses requested for each sample. Figure 8.7-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

8.7.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 8.7-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at AOC 32-004. The sampling locations and detected concentrations are shown in Figure 8.7-2.

The identification of inorganic COPCs is presented in Appendix F, section F-5.5.1. The inorganic COPCs identified at AOC 32-004 are antimony, chromium, copper, total cyanide, lead, mercury, nickel, nitrate, selenium, silver, thallium, and zinc.

Organic Chemicals

Table 8.7-3 lists the detected organic chemicals at AOC 32-004. The sampling locations and detected concentrations are shown in Figure 8.7-3.

The identification of organic COPCs is presented in Appendix F, section F-5.5.2. The organic COPCs identified at AOC 32-004 are acenaphthene; acetone; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; chrysene; di-n-octylphthalate; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; naphthalene; phenanthrene; and pyrene.

Radionuclides

Table 8.7-4 lists the radionuclide detected above FV at AOC 32-004. The sampling locations and detected concentrations are shown in Figure 8.7-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-5.5.3. The only radionuclide COPC identified at AOC 32-004 is americium-241.

8.7.3 Nature and Extent of Contamination

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs at AOC 32-004 are defined. The evaluation of the nature and extent of contamination at AOC 32-004 is presented in Appendix F, section F-5.5.5. Because the site has been heavily disturbed and receives substantial runoff from pavement, the site will be further evaluated to if soil removal is warranted to reduce concentrations of PAHs.

8.7.4 Summary of Human Health Risk Screening

The results of the risk screening assessment for the industrial scenario at AOC 32-004 are presented in Appendix G, Tables G-4.2-97, G-4.2-98, and G-4.2-99.

The results of the risk screening assessment for the construction worker scenario are presented in Appendix G, Tables G-4.2-100, G-4.2-101, and G-4.2-102.

The results of the risk screening assessment for the residential scenario are presented in Appendix G, Tables G-4.2-103, G-4.2-104, G-4.2-105, and G-4.2-106.

The total excess cancer risk for the industrial, construction worker, and residential scenarios are 2×10^{-5}, 1×10^{-5}, and 5×10^{-5}, respectively. The risk for the construction worker scenario is below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The risks for the industrial and residential scenarios are above the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HIs are 0.1, 0.1, and 0.2, which are below the NMED target HI of 1.0 (NMED 2006, 092513). The total doses are 0.01 mrem/yr, 0.04 mrem/yr, and 0.05 mrem/yr, respectively, which are below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the industrial scenario is equivalent to a total risk of 2×10^{-8}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the construction worker scenario is equivalent to a total risk of 1×10^{-5}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the residential scenario is equivalent to a total risk of 5×10^{-8}, based on a comparison with EPA's residential PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

For vapor intrusion the HI is approximately 0.000008, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). There are no carcinogenic VOCs detected.

Based on the risk screening assessment results, there are no potential unacceptable doses under the construction worker scenario at AOC 32-004. There are potential unacceptable risks from COPCs for the industrial and residential scenarios.

8.7.5 Summary of Ecological Risk Screening

No potential unacceptable risks are present to ecological receptors at AOC 32-004. Ecological risk screening assessments are presented in Appendix G, section G-5.0.

8.8 Conclusions—Former TA-32

SWMU 32-001

The nature and extent of all COPCs are defined, and there are no potential unacceptable risks or doses to human health or the environment at the site. Therefore, no further investigation or remediation activities are warranted for SWMU 32-001.

SWMU 32-002(a)

Additional sampling is necessary to define the vertical extent of TAL metals at SWMU 32-002(a). The concentrations of lead and arsenic exceeded the residential screening level at one location and warrant

limited removal of soil. Human health and ecological risk screening assessments will be performed after any soil removal has been completed and after the lateral and vertical extent of contamination have been defined.

SWMU 32-002(b)

Additional sampling is necessary to define the vertical extent of TAL metals at SWMU 32-002(b). Human health and ecological risk screening assessments will be performed after any soil removal has been completed and after the lateral and vertical extent of contamination have been defined.

AOC 32-003

Additional sampling is necessary to define the lateral extent of Aroclor-1260 and the lateral and vertical extent of PAHs. Concentrations of Aroclor-1260 exceeded the residential screening level at two locations and warrant limited removal of soil at AOC 32-003. Human health and ecological risk screening assessments will be performed after any soil removal has been completed and after the lateral and vertical extent of contamination have been defined.

AOC 32-004

The nature and extent of all COPCs at AOC 32-004 are defined, and there are no potential unacceptable risks or doses to human health under the construction worker scenario at the site. There are potential unacceptable risks to human health under the industrial and residential scenarios. Most of the excess risk is from relatively high concentrations of benzo(a)pyrene in 1996 samples from multiple locations; these locations include under pavement or receive drainage from adjacent pavement. Additional sampling is needed to verify current site conditions and to determine if soil removal is warranted to reduce the risk from PAHs.

9.0 TA-41 SITE INVESTIGATIONS

One site, SWMU 41-001, was sampled (Table 1.1-1) according to the work plan (LANL 2006, 091916) and NMED's approval with modifications (NMED 2006, 095460).

9.1 Field-Investigation Results—TA-41

9.1.1 Surface Conditions

TA-41 is entirely within Laboratory boundaries in the bottom of Los Alamos Canyon (Plate 2.1-1). The TA-41 facilities include laboratory or industrial buildings and structures that are currently in use or planned for reactivation or that are inactive and planned for demolition.

The material at the surface of TA-41 consists variably of coarse-grained alluvium associated with the main channel of Los Alamos Canyon, alluvial sediment, limited areas of topsoil, and tuff outcrops. Vegetation consists of ponderosa pines, grasses, and various shrubs, including oak.

A paved road (Omega Road) extends partially through Los Alamos Canyon on the south side of the TA-41 sites. Immediately to the north of the sites is the steep south-facing slope of Los Alamos Canyon.

9.1.2 Exploratory Drilling or Excavation Investigations

No exploratory drilling or excavation was conducted at the TA-41 sites. All drilling was for the purpose of collecting investigation samples.

9.1.3 Subsurface Conditions

The rock units that were encountered at and below the surface during investigation of the TA-41 site were units 2 and 1g of the Tshirege Member of the Bandelier Tuff (Qbt 2 and Qbt 1g). These units are briefly described in section 5.1.3.

The stratigraphy of the Upper Los Alamos Canyon Aggregate Area is described in more detail in the work plan (LANL 2006, 091916).

Subsurface structures encountered included utilities, which were marked out before sampling began. An underground tunnel (structure 41-1) extends into the canyon wall approximately 100 ft north of SWMU 41-001.

9.1.4 Groundwater Conditions

Sites at TA-41, in the bottom of Los Alamos Canyon, are approximately 700 ft or more above the regional aquifer (Figure 5.1-1). Alluvial groundwater could be present in Los Alamos Canyon in the region of the Upper Los Alamos Canyon Aggregate Area. Groundwater monitoring is currently performed at the Laboratory through an integrated sitewide groundwater monitoring program (LANL 2008, 101897). Plate 2.1-1 shows the locations of all groundwater monitoring wells in the vicinity of TA-41. No groundwater sampling or other groundwater investigations were included in the scope of this investigation. No alluvial or shallow groundwater was encountered during this investigation.

9.1.5 Surface Water Conditions

No natural permanent surface water is present at TA-41. The main channel of Los Alamos Canyon is located approximately 100 ft south of SWMU 41-001 (Plate 2.1-1). The channel is an intermittent stream, and seasonal flow occurs in response to spring snowmelt or summer thunderstorms. During summer thunderstorms and spring snowmelt, runoff may flow from the mesa-top onto the hillsides (canyon slopes) of Los Alamos Canyon.

No surface water sampling or other surface water investigations were included in the scope of this investigation.

9.2 Field-Screening Results—TA-41

No organic vapors were detected at more than 10 ppm above ambient air during PID screening of subsurface cores. No radiological screening results exceeded twice the daily site background levels. Field-screening results for TA-41 are presented in Table 4.5-1. There were no changes to sampling or other activities as a result of field-screening results.

9.3 Site Contamination—SWMU 41-001

9.3.1 Soil, Rock, and Sediment Sampling

A total of 34 samples were collected from 16 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at SWMU 41-001, a septic system. Table 9.3-1 lists the samples collected

and the analyses requested for each sample. Figure 9.3-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

9.3.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 9.3-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at SWMU 41-001. The sampling locations and detected concentrations are shown in Figure 9.3-2.

The identification of inorganic COPCs is presented in Appendix F, section F-6.1.1. The inorganic COPCs identified at SWMU 41-001 are aluminum, antimony, arsenic, barium, calcium, chromium, copper, total cyanide, iron, lead, manganese, nickel, nitrate, perchlorate, selenium, vanadium, and zinc.

Organic Chemicals

Table 9.3-3 lists the detected organic chemicals at SWMU 41-001. The sampling locations and detected concentrations are shown in Figure 9.3-3.

The identification of organic COPCs is presented in Appendix F, section F-6.1.2. The organic COPCs identified at SWMU 41-001 are acetone; anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzyl alcohol; bis(2-ethylhexyl)phthalate; chrysene; di-n-butylphthalate; fluoranthene; indeno(1,2,3-cd)pyrene; pyrene; and toluene.

Radionuclides

Table 9.3-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at SWMU 41-001. The sampling locations and detected concentrations are shown in Figure 9.3-4.

The identification of radionuclide COPCs is presented in Appendix F, section F-6.1.3. The radionuclide COPCs identified at SWMU 01-001(a) are plutonium-239/240, tritium, and uranium-235/236.

9.3.3 Nature and Extent of Contamination

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined. The evaluation of the nature and extent of contamination at SWMU 41-001 is presented in Appendix F, section F-6.1.5.

9.3.4 Summary of Human Health Risk Screening

The results of the risk screening assessment for the industrial scenario at SWMU 41-001 are presented in Appendix G, Tables G-4.2-107, G-4.2-108, and G-4.2-109.

The results of the risk screening assessment for the recreational scenario are presented in Appendix G, Tables G-4.2-110, G-4.2-111, and G-4.2-112.

The results of the risk screening assessment for the residential scenario are presented in Appendix G, Tables G-4.2-113, G-4.2-114, and G-4.2-115.

The total excess cancer risk for the industrial, recreational, and residential scenarios are 9×10^{-7}, 5×10^{-7}, and 7×10^{-7}, respectively. These risks are below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HIs are 0.09, 0.09, and 0.3, respectively, which is below the NMED target HI of 1.0 (NMED 2006, 092513). The total doses are 0.05 mrem/yr, 0.02 mrem/yr, and 0.2 mrem/yr, which are below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the industrial scenario is equivalent to a total risk of 2×10^{-6}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the recreational scenario is equivalent to a total risk of 2×10^{-8}, based on conversion from dose using RESRAD, Version 6.21. The total dose for the residential scenario is equivalent to a total risk of 1×10^{-6}, based on a comparison with EPA's residential PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

Based on the risk screening assessment results, there are no potential unacceptable risks or doses under the industrial, recreational, and residential scenarios at SWMU 41-001.

9.3.5 Summary of Ecological Risk Screening

No potential unacceptable risks are present to ecological receptors at SWMU 41-001. Ecological risk screening assessments are presented in Appendix G, section G-5.0.

9.4 Conclusions—TA-41

The nature and extent of all COPCs at SWMU 41-001 are defined, and there are no potential unacceptable risks to human health or the environment at the site. Therefore, no further investigation or remediation activities are warranted for SWMU 41-001.

10.0 TA-43 SITE INVESTIGATIONS

Two sites [AOC 43-001(b2) and AOC C-43-001] at TA-43 were sampled (Table 1.1-1) as directed by the work plan (LANL 2006, 091916) and NMED's approval with modifications (NMED 2006, 095460).

10.1 Field Investigation Results—TA-43

10.1.1 Surface Conditions

TA-43 is on the mesa-top adjacent to Diamond Drive in the Los Alamos townsite, next to active Laboratory facilities at the Bioscience [B] Division's HRL and the site of LAMC. The area is highly developed and is mostly covered by buildings and pavement. Immediately south of the facilities is the steep north slope of Los Alamos Canyon (Plate 2.1-1).

10.1.2 Exploratory Drilling or Excavation Investigations

No exploratory drilling or excavation was conducted at the TA-43 sites. All sampling was performed using hand-auger methods.

10.1.3 Subsurface Conditions

The rock units that were encountered at and below the surface during investigation of the TA-43 sites were Units 3 and 2 of the Tshirege Member of the Bandelier Tuff (Qbt 3 and Qbt 2). These units are

briefly described in section 5.1.3. The stratigraphy of the Upper Los Alamos Canyon Aggregate Area is described in more detail in the work plan (LANL 2006, 091916).

Subsurface structures in the vicinity of the TA-43 sites included utilities, which were marked out before sampling began.

10.1.4 Groundwater Conditions

For mesa-top sites of the Upper Los Alamos Canyon Aggregate Area, the surface is separated from the regional aquifer by an unsaturated zone that is approximately 1000 to 1300 ft thick (Figure 5.1-1). Groundwater monitoring is currently performed at the Laboratory through an integrated sitewide groundwater monitoring program (LANL 2008, 101897). Plate 2.1-1 shows the locations of all groundwater monitoring wells in the vicinity of TA-43. No groundwater sampling or other groundwater investigations were included in the scope of this investigation.

10.1.5 Surface Water Conditions

No natural permanent surface water is present at the mesa-top sites of the Upper Los Alamos Canyon Aggregate Area. During summer thunderstorms and spring snowmelt, runoff may flow from the mesa-top onto the hillsides (canyon slopes) of Los Alamos Canyon. Seasonal flow occurs in the main channel of Los Alamos Canyon in response to spring snowmelt or summer thunderstorms.

No surface water sampling or other surface water investigations were included in the scope of this investigation, and no surface water was present during investigation activities.

10.2 Field-Screening Results—TA-43

No organic vapors were detected at more than 10 ppm above ambient air during PID screening of subsurface cores. No radiological screening results exceeded twice the daily site background levels. Field-screening results for TA-43 are presented in Table 4.5-1. There were no changes to sampling or other activities as a result of field-screening results.

10.3 Site Contamination—AOC 43-001(b2)

10.3.1 Soil, Rock, and Sediment Sampling

A total of 23 samples were collected from 11 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at AOC 43-001(b2), an outfall. Table 10.3-1 lists the samples collected and the analyses requested for each sample. Figure 10.3-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

10.3.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 10.3-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at AOC 43-001(b2). The sampling locations and detected concentrations are shown in Figure 10.3-2.

The identification of inorganic COPCs is presented in Appendix F, section F-7.1.1. The inorganic COPCs identified at AOC 43-001(b2) are arsenic, cadmium, chromium, copper, total cyanide, lead, nickel, nitrate, selenium, and zinc.

Organic Chemicals

Table 10.3-3 lists the detected organic chemicals at AOC 43-001(b2). The sampling locations and detected concentrations are shown on Plate 10.3-1.

The identification of organic COPCs is presented in Appendix F, section F-7.1.2. The organic COPCs identified at AOC 43-001(b2) are acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; carbon disulfide; butylbenzylphthalate; chrysene; di-n-octylphthalate; dibenz(a,h)anthracene; dibenzofuran; 1,3-dichlorobenzene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; styrene; 1,2,4-trimethylbenzene; and dioxins and furans (1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans).

Radionuclides

Table 10.3-4 lists the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply at AOC 43-001(b2). The sampling locations and detected concentrations are shown in Figure 10.3-3.

The identification of radionuclide COPCs is presented in Appendix F, section F-7.1.3. The radionuclide COPC identified at AOC 43-001(b2) is uranium-235/236.

10.3.3 Nature and Extent of Contamination

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs at AOC 43-001(b2) are defined. The evaluation of the nature and extent of contamination at AOC 43-001(b2) is presented in Appendix F, section F-7.1.5.

10.3.4 Summary of Human Health Risk Screening

The results of the risk screening assessment for the recreational scenario at AOC 43-001(b2) are presented in Appendix G, Tables G-4.2-117, G-4.2-118, and G-4.2-119.

The results of the risk screening assessment for the residential scenario are presented in Appendix G, Tables G-4.2-121, G-4.2-122, and G-4.2-123.

The total excess cancer risk for the recreational and residential scenarios are 1×10^{-5} and 4×10^{-5}, respectively. The risk for the recreational scenario is equivalent to the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The risk for the residential scenario is above the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HIs are 0.1 for both scenarios, which is below the NMED target HI of 1.0 (NMED 2006, 092513). The total doses are 0.01 mrem/yr and 0.2 mrem/yr, respectively, which are below

the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the recreational scenario is equivalent to a total risk of 2×10^{-8}, based on conversion from dose using RESRAD, Version 6.21. The total dose for the residential scenario is equivalent to a total risk of 1×10^{-6}, based on a comparison with EPA's residential PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

Based on the risk screening assessment results, there are no potential unacceptable risks or doses under the recreational scenario at AOC 43-001(b2). Based on the screening assessment results, there are potential unacceptable risks under the residential scenario. Most of the excess risk is due to relatively high concentrations of benzo(a)pyrene and other PAHs at multiple locations on the slope next to the parking lot and TA-43 access road. The slope, which is on DOE property, is not suitable for residential use but may be used recreationally.

10.3.5 Summary of Ecological Risk Screening

No potential unacceptable risks are present to ecological receptors at AOC 43-001(b2). Ecological risk screening assessments are presented in Appendix G, section G-5.0.

10.4 Site Contamination—AOC C-43-001

10.4.1 Soil, Rock, and Sediment Sampling

A total of 15 samples were collected from 7 locations and analyzed for inorganic chemicals, organic chemicals, and radionuclides at AOC C-43-001, an outfall. Table 10.4-1 lists the samples collected and the analyses requested for each sample. Figure 10.4-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

10.4.2 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 10.4-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs at AOC C-43-001. The sampling locations and detected concentrations are shown in Figure 10.4-2.

The identification of inorganic COPCs is presented in Appendix F, section F-7.2.1. The inorganic COPCs identified at AOC C-43-001 are cadmium, chromium, copper, total cyanide, lead, mercury, nickel, nitrate, selenium, and zinc.

Organic Chemicals

Table 10.4-3 lists the detected organic chemicals at AOC C-43-001. The sampling locations and detected concentrations are shown on Plate 10.4-1.

The identification of organic COPCs is presented in Appendix F, section F-7.2.2. The organic COPCs identified at AOC C-43-001 are acenaphthene; acenaphthylene, acetone, anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; bromomethane; butylbenzylphthalate; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; toluene; and dioxins and furans (1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total

heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans).

Radionuclides

Table 10.4-4 lists the radionuclide detected that has no FV at AOC C-43-001. The sampling locations and detected concentrations are shown in Figure 10.4-3.

The identification of radionuclide COPCs is presented in Appendix F, section F-7.2.3. The only radionuclide COPC identified at AOC C-43-001 is tritium.

10.4.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at AOC C-43-001 is presented in Appendix F, section F-7.2.5. The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined, except

- the lateral extent of chromium, copper, lead, and zinc.

10.4.4 Summary of Human Health Risk Screening

Because the extent of contamination has not been defined at AOC C-43-001, no human health risk screening assessment was conducted for the site. A human health risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

10.4.5 Summary of Ecological Risk Screening

Because the extent of contamination has not been defined at AOC C-43-001, no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after additional investigation activities define the extent of contamination.

10.5 Conclusions—TA-43

AOC 43-001(b2)

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs at AOC 43-001(b2) are defined, and there are no potential unacceptable risks or doses under the recreational scenario. There are potential unacceptable risks under the residential scenario. However, the current and reasonably foreseeable future land use is recreational. Therefore, no further investigation or remediation activities are warranted for AOC 43-001(b2).

AOC C-43-001

Additional sampling is necessary to define the lateral extent of chromium, copper, lead, and zinc in the downslope direction at AOC C-43-001. Human health and ecological risk screening assessments will be performed after the lateral extent of contamination has been defined.

11.0 TA-61 SITE INVESTIGATION

One site, SWMU 61-007, was sampled (Table 1.1-1) according to the work plan (LANL 2006, 091916) and NMED's approval with modifications (NMED 2006, 095460).

11.1 Field Investigation Results—TA-61

11.1.1 Surface Conditions

TA-61 is located on the mesa-top between Los Alamos Canyon to the north and Sandia Canyon to the south (Plate 2.1-1). The major facility in the area is the Los Alamos County landfill on the south side of East Jemez Road and next to Sandia Canyon. The remainder of the area, consisting of the narrow mesa-top adjacent to East Jemez Road, is undeveloped.

11.1.2 Exploratory Drilling or Excavation Investigations

No exploratory drilling or excavation was conducted at TA-61. All drilling was for the purpose of collecting investigation samples.

11.1.3 Subsurface Conditions

The rock unit encountered below the surface during investigation of the TA-61 site was unit 3 of the Tshirege Member of the Bandelier Tuff (Qbt 3). This unit is briefly described in section 5.1.3. The stratigraphy of the Upper Los Alamos Canyon Aggregate Area is described in more detail in the work plan (LANL 2006, 091916).

Subsurface structures encountered included numerous utilities, which were marked out before sampling began.

11.1.4 Groundwater Conditions

For mesa-top sites of the Upper Los Alamos Canyon Aggregate Area, including TA-61, the surface is separated from the regional aquifer by an unsaturated zone that is approximately 1000 to 1300 ft thick (Figure 5.1-1). Groundwater monitoring is currently performed at the Laboratory through an integrated sitewide groundwater monitoring program (LANL 2008, 101897). Plate 2.1-1 shows the locations of all groundwater monitoring wells in the vicinity of TA-61. No groundwater sampling or other groundwater investigations were included in the scope of this investigation.

11.1.5 Surface Water Conditions

No natural permanent surface water is present at the mesa-top sites of the Upper Los Alamos Canyon Aggregate Area. During summer thunderstorms and spring snowmelt, runoff may flow from the mesa-top onto the hillsides (canyon slopes) of Los Alamos Canyon. Seasonal flow occurs in the main channel of Los Alamos Canyon in response to spring snowmelt or summer thunderstorms.

No surface water sampling or other surface water investigations were included in the scope of this investigation, and no surface water was present during investigation activities.

11.2 Field-Screening Results—TA-61

No organic vapors were detected at more than 10 ppm above ambient air during PID screening of subsurface cores. No radiological screening results exceeded twice the daily site background levels. Field-screening results for TA-61 are presented in Table 4.5-1. There were no changes to sampling or other activities as a result of field-screening results.

11.3 Site Contamination—SWMU 61-007

11.3.1 Soil, Rock, and Sediment Sampling

A total of 22 samples were collected from 6 locations and analyzed for PCBs, SVOCs, and VOCs at SWMU 61-007, a transformer leak site. Table 11.3-1 lists the samples collected and the analyses requested for each sample. Figure 11.3-1 shows the sampling locations. Analytical methods and summaries of data quality results are presented in Appendix D. Field records and analytical results are included on DVDs in Appendix E.

11.3.2 Soil, Rock, and Sediment Sampling Analytical Results

Organic Chemicals

Table 11.3-2 lists the detected organic chemicals at SWMU 61-007. The sampling locations and detected concentrations are shown in Figure 11.3-2.

The identification of organic COPCs is presented in Appendix F, section F-8.1.1. The organic COPCs identified at SWMU 61-007 are acenaphthene; acetone; anthracene; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzyl alcohol; bis(2-ethylhexyl)phthalate; 2-butanone; chrysene; dibenzofuran; 1,2-dichlorobenzene; fluoranthene; fluorene; hexachlorobenzene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; tetrachloroethene; toluene; and 1,2,4-trichlorobenzene.

11.3.3 Nature and Extent of Contamination

The evaluation of the nature and extent of contamination at SWMU 61-007 is presented in Appendix F, section F-8.1.3. The lateral and vertical extent of Aroclor-1260 are not adequately defined, and additional characterization sampling is warranted.

The concentrations of Aroclor-1260 (maximum 1200 mg/kg) exceeded the residential screening level at three locations and in samples as deep as 17–17.5 ft bgs. The concentrations of Aroclor-1260 warrant soil removal at SWMU 61-007.

11.3.4 Summary of Human Health Risk Screening

Because concentrations of Aroclor-1260 warrant soil removal at SWMU 61-007, no human health risk screening assessment was conducted. A human health risk screening assessment will be conducted after soil removal is completed and after additional sampling shows that the cleanup was effective and that the extent of contamination is defined.

11.3.5 Summary of Ecological Risk Screening

Because soil removal is warranted at SWMU 61-007, no ecological risk screening assessment was conducted for the site. An ecological risk screening assessment will be conducted after soil removal is completed, and after additional sampling shows that the cleanup was effective and that the extent of contamination is defined.

11.4 Conclusions—TA-61

Additional sampling is necessary to define the lateral and vertical extent of Aroclor-1260 at SWMU 61-001. Concentrations of Aroclor-1260 exceed the residential screening level and warrant soil removal. Human health and ecological risk screening assessments will be performed after soil removal is completed and the lateral and vertical extent of contamination have been defined. Soil removal will be complicated by the presence of numerous surface and subsurface utilities.

12.0 CONCLUSIONS—UPPER LOS ALAMOS CANYON AGGREGATE AREA

12.1 Summary of Nature and Extent

12.1.1 Sites Where Nature and Extent Are Defined

Nature and extent have been defined at 20 of the 47 sites investigated during the 2008–2009 Upper Los Alamos Canyon Aggregate Area investigation. Eighteen sites do not pose a potential unacceptable risk under a residential scenario:

- AOC 00-031(a)
- SWMU 01-001(b)
- SWMU 01-001(c)
- SWMU 01-001(e)
- SWMU 01-001(t)
- SWMU 01-001(u)
- SWMU 01-002
- SWMU 01-003(e)
- SWMU 01-006(d)
- AOC 01-006(g)
- SWMU 01-006(o)
- SWMU 01-007(d)
- SWMU 01-007(e)
- SWMU 01-007(j)
- AOC 01-007(k)
- SWMU 03-009(j)
- SWMU 32-001
- SWMU 41-001

One site, AOC 43-001(b2), does not pose a potential unacceptable risk or dose under the recreational scenario, which is the current and reasonably foreseeable land use scenario.

The last site of the 20 for which the nature and extent of contamination have been defined was found to pose a potential unacceptable excess cancer risk under the industrial and residential scenarios. The cancer risk at this site, AOC 32-004, is driven by the presence of PAHs at elevated levels in samples collected in 1996 beneath and adjacent to asphalt pavement.

12.1.2 Sites Where Nature and Extent Are Not Defined

Nature and extent have not been defined at 27 of the 47 sites investigated during the 2008–2009 Upper Los Alamos Canyon Aggregate Area investigation. These sites require additional characterization for certain COPCs:

- SWMU 00-017—lateral and vertical extent of lead
- SWMU 01-001(a)—lateral and vertical extent of TAL metals and bis(2-ethylhexyl)phthalate

- SWMU 01-001(d)—lateral and vertical extent of TAL metals, cesium-137, and plutonium-239/240
- SWMU 01-001(f)—lateral and vertical extent of inorganic, organic, and radionuclide COPCs
- SWMU 01-001(g)—vertical extent of chromium and nickel and lateral and vertical extent of plutonium-239/240
- SWMU 01-001(o)— vertical extent of TAL metals; lateral and vertical extent of Aroclor-1254, di-n-butylphthalate, and radionuclide COPCs
- SWMU 01-001(s)—lateral extent of TAL metals; vertical extent of plutonium-239/240 and tritium
- SWMU 01-003(a)—lateral and vertical extent of TAL metals and plutonium-239/240
- SWMU 01-003(b)—vertical extent of TAL metals
- SWMU 01-003(d)—lateral extent of antimony, barium, lead, and zinc and lateral and vertical extent of selenium.
- SWMU 01-006(a)—vertical extent of plutonium-239/240 and lateral and vertical extent of uranium-235/236
- SWMU 01-006(b)—lateral and vertical extent of americium-241 and plutonium-239/240
- SWMU 01-006(c)—lateral and vertical extent of chromium and nickel, and vertical extent of organic COPCs and plutonium-239/240
- SWMU 01-006(e)—vertical extent of barium, chromium, and nickel
- SWMU 01-006(h)—lateral and vertical TAL metals, cesium-137, and plutonium-239/240
- SWMU 01-006(n)—lateral and vertical extent of plutonium-239/240
- SWMU 01-007(a)—vertical extent of chromium and nickel; lateral and vertical extent of bis(2-ethylhexyl)phthalate
- SWMU 01-007(b)—lateral and vertical extent of chromium, nickel, and selenium; vertical extent of bis(2-ethylhexyl)phthalate
- SWMU 01-007(c)—lateral and vertical extent of chromium and nickel
- SWMUs 03-038(a) and 03-038(b)—vertical extent of barium, chromium, copper, lead, and nickel and the lateral extent of barium
- SWMU 03-055(c)—vertical extent of zinc
- SWMU 32-002(a)—vertical extent of barium, chromium, and nickel
- SWMU 32-002(b)—vertical extent of barium; lateral and vertical extent of chromium and nickel
- SWMU 32-003—lateral extent of Aroclor-1260; lateral and vertical extent of PAHs
- AOC C-43-001—lateral extent of copper, chromium, lead, and zinc
- SWMU 61-007—lateral and vertical extent of Aroclor-1260

12.1.3 Other Potential Sources of Contamination

Hand augers were used extensively in this investigation to collect shallow subsurface samples for reasons of site accessibility and property-owner preference. However, using a hand auger in tuff required substantial physical effort and resulted in abrasion of the stainless-steel auger buckets. In evaluating the extent of inorganic COPCs, it was noted that chromium and nickel concentrations at many sampling locations increased with depth even when other metals were decreasing in concentration or were mostly

below background. Chromium and nickel were COPCs in tuff much more frequently than they were COPCs in soil, fill, or sediment. Further, chromium and nickel concentrations were detected at a ratio of approximately 2:1 in many samples. Based on the manufacturer's material safety data sheet, the ratio of chromium to nickel in the stainless-steel hand augers used was also approximately 2:1 (17.5% to 20.5% chromium; 8% to 11% nickel). Several samples were reanalyzed for chromium, with poor reproducibility, indicating that chromium results are variable within the same sample. This finding suggests the possibility of a "nugget effect," as would be expected in samples that are impacted by small particles of metal from sampling equipment. More consistent chromium results would be expected in samples contaminated by effluent. While the data in this investigation do not provide conclusive evidence, it appears that the increasing chromium and nickel concentrations with depth at some locations are artifacts related to the use of stainless-steel hand augers in relatively hard tuff. The hardness of the tuff is variable, depending upon the degree of welding, and therefore, the effort required and the corresponding abrasion of auger buckets varies from location to location. The effect of using a hand auger to collect samples in indurated tuff has been noted at other Laboratory sites (LANL 2005, 090112).

The extent evaluations in this investigation report have conservatively treated such increasing concentrations of chromium and nickel as instances where vertical extent is not defined, unless the concentrations were relatively low compared to the range of background or other locations in the vicinity provided supplemental information to define vertical extent.

Because the Upper Los Alamos Canyon Aggregate Area is largely located in developed areas with extensive roads and paved areas, it is likely that most locations sampled have received surface runoff containing chemicals originating from asphalt pavement and automotive fuels and other fluids. At most locations on the mesa top, PAHs and other organic chemicals were detected at low concentrations in shallow samples. Concentrations were generally low, near the estimated quantitation limits, and decreased with depth and distance downslope from paved sources. At TA-32, Los Alamos County stages asphalt for subsequent use and also washes out the contents of street sweepers. PAHs are ubiquitous in samples from TA-32. It is unlikely that the PAHs detected at these sites are related to past or present Laboratory operations, but PAH concentrations have conservatively been evaluated as site contaminants.

12.2 Risk Assessment Summary

12.2.1 Human Health Risk Screening Assessment

Human health risk screening assessments were performed for the 20 sites for which the nature and extent of contamination have been defined. Human health risk screening assessments are presented in Appendix G, section G-4.0. Nineteen of the 20 sites were determined to have no potential unacceptable risk to human health under the current and reasonably foreseeable land-use scenarios. One site was found to pose a potential unacceptable risk to human health. SWMU 32-004 was found to have potential excess cancer risk under industrial and residential scenarios that exceeded the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The excess cancer risk was primarily from the concentrations of benzo(a)pyrene above screening levels in samples collected during the 1996 investigation.

The Laboratory's as low as reasonably achievable (ALARA) program description states that quantitative ALARA evaluations are not necessary for Laboratory activities that have a potential for annual public exposure less than a 3-mrem total effective dose equivalent individual dose ("Los Alamos National Laboratory Environmental ALARA Program," PD410, p. 7, effective November 8, 2008). For SWMUs 01-001(e), 01-006(d), 01-007(d), 01-007(e), and 01-007(j) and AOC 00-031(a), where public access is available, radiological dose was not calculated because no radionuclide COPCs were identified at these sites. The calculated radiation dose(s) for the residential scenario at the other sites with public

access ranged from 0.05 mrem/yr to 2.6 mrem/yr. Therefore, radiation exposures to the public at the sites evaluated within the Upper Los Alamos Canyon Aggregate Area in this investigation report are ALARA.

Sites at TA-03, TA-41, and TA-43 are inaccessible by the public and are not planned for release by DOE in the foreseeable future. Therefore, an ALARA evaluation for radiological exposure to the public is not currently required. Should DOE's plans for releasing these areas change, an ALARA evaluation will be conducted at that time. It should be noted that the Laboratory addresses considerations for radiation exposures to workers under the Laboratory's occupational radiological protection program in compliance with 10 Code of Federal Regulations 835. The Laboratory's radiation protection program implements ALARA and consists of the following elements: management commitment, training, design review, radiological work review, performance assessments, and documentation.

12.2.2 Ecological Risk Screening Assessment

Ecological risk screening assessments were performed for the 20 sites for which the nature and extent of contamination have been defined. Ecological risk screening assessments are presented in Appendix G, section G-5.0. No potential unacceptable risks are present to ecological receptors at any of the 20 sites.

13.0 RECOMMENDATIONS

Table 13.0-1 summarizes the findings of this investigation and the proposed additional activities, if any, for the 47 sites investigated.

The nature and extent of contamination have been defined at 20 of the 47 sites (section 12.1.1). Eighteen of these have been determined to pose no potential unacceptable risk to human health under the residential criteria or to ecological receptors and are recommended for corrective actions complete without controls. An additional 6 sites (3 in TA-00, 2 in TA-01, and 1 in TA-03—see sections 2.1, 2.2, and 2.3, respectively) were proposed for no further sampling in the approved investigation work plan (LANL 2006, 091916; NMED 2006, 095460). No further investigation or remediation activities are warranted for these 6 sites, and they are also recommended for corrective actions complete without controls. Therefore, the Laboratory will request certificates of completion for a total of 24 sites under separate cover.

At one site, AOC 43-001(b2), the nature and extent of contamination have been defined, and the site has been determined to pose a potential unacceptable risk under the residential criteria. However, the site does not pose a potential unacceptable risk to human health under the recreational scenario, which is the current and reasonably foreseeable future land use, or to ecological receptors. Therefore, AOC 43-001(b2) is proposed for corrective actions complete with controls. The Laboratory will request a certificate of completion for AOC 43-001(b2) under separate cover.

Twenty-seven of the 47 sites investigated in the Upper Los Alamos Canyon Aggregate Area require additional sampling to define the extent of contamination. Those sites and the remaining extent requirements are listed in section 12.1.2. A Phase II investigation work plan will be developed specifying sampling locations, numbers of samples, and analytical suites to collect the samples required to define the extent of contamination for those sites. The evaluation of further actions at these sites will include such factors as exposure point concentrations relative to screening levels, land use, site accessibility to potential receptors, feasibility of removal, and potential reduction in human health and ecological risk.

At 9 of the 27 sites for which the extent of contamination is not defined, enough data have been collected to determine that removal actions are warranted. These sites and the contaminant(s) driving the proposed removal are as follows:

- SWMU 01-001(d)—plutonium-239/240
- SWMU 01-001(f)—Aroclor-1254
- SWMU 01-001(o)—Aroclor-1254
- SWMU 01-003(a)—Aroclor-1254 and lead
- SWMU 01-006(b)—plutonium-239/240
- SWMU 01-006(h)—plutonium-239/240
- SWMU 32-002(a)—lead and arsenic
- AOC 32-003—Aroclor-1260
- SWMU 61-007—Aroclor-1260

The Phase II investigation work plan will include detailed plans for removing soil, fill, sediment, or tuff from these nine sites to reduce concentrations of the identified COPCs and associated risks to the extent practicable. Confirmation and additional extent sampling will also be conducted at these sites.

One site for which the nature and extent of contamination have been defined, AOC 32-004, has been determined to pose potential unacceptable risk to human health from the presence of PAHs at elevated concentrations in samples collected in 1996. The Phase II investigation work plan will propose additional sampling to verify current site conditions and to determine if soil removal is warranted to reduce the potential risk to acceptable levels.

To evaluate or mitigate the potential effect of stainless-steel hand augers on concentrations of chromium and nickel, the Phase II investigation work plan will provide for using a different auger material, such as carbon steel, or a different sampling method, at selected locations. Additional samples may be collected next to the planned sampling locations using the alternate auger to allow comparisons of chromium and nickel concentrations between samples collected with the two different tools. This approach will be used selectively (i.e., at a limited number of locations where the tuff is noted to be relatively difficult to auger). This approach was used at Consolidated Unit 21-013(d)-99, where unexplained detections of chromium, copper, and nickel occurred at depth, although they were not detected above BVs in shallower samples from this surface disposal site. The results of using a different sampling method confirmed the stainless-steel hand auger was the source of the observed chromium, copper, and nickel detections at this site (LANL 2005, 090112).

Completion of the proposed additional activities at sites located on private property within the Upper Los Alamos Canyon Aggregate Area is subject to approval by the various property owners involved.

Upon completion of the proposed sampling and soil removal activities, the data collected will be used to confirm the extent of contamination has been defined and to complete human health and ecological risk screening assessments for all remaining sites. The results will be presented in a Phase II investigation report for the Upper Los Alamos Canyon Aggregate Area.

14.0 PROPOSED SCHEDULE FOR RECOMMENDED ACTIVITIES

A Phase II investigation work plan will be developed and submitted to NMED 6 months after this revised investigation report is approved. The Phase II investigation work plan will provide details and a schedule for implementing sampling and remediation activities and for submitting a Phase II investigation report.

Sampling and remedial activities at former TA-32 sites are to be performed as directed in an accelerated corrective action work plan, submitted to NMED in December 2009, and are expected to be completed in March 2010. Remediation is also being conducted at SWMU 01-001(f) and is also expected to be completed in March 2010. The results of these activities will be included in the Phase II investigation report as well as in site-specific completion reports.

15.0 REFERENCES AND MAP DATA SOURCES

15.1 References

The following list includes all documents cited in this report. 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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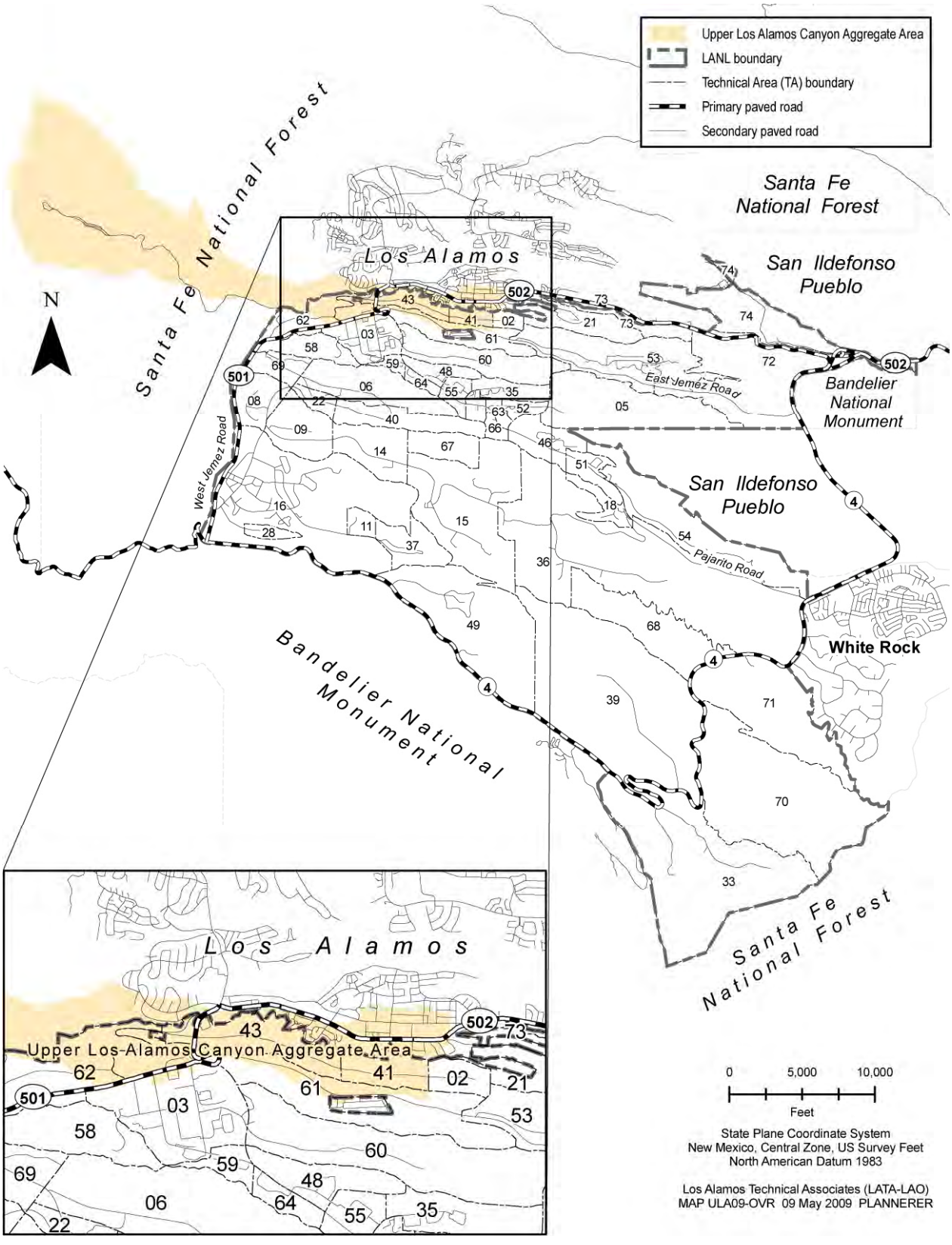


Figure 1.1-1 Location of Upper Los Alamos Canyon Aggregate Area and surrounding technical areas

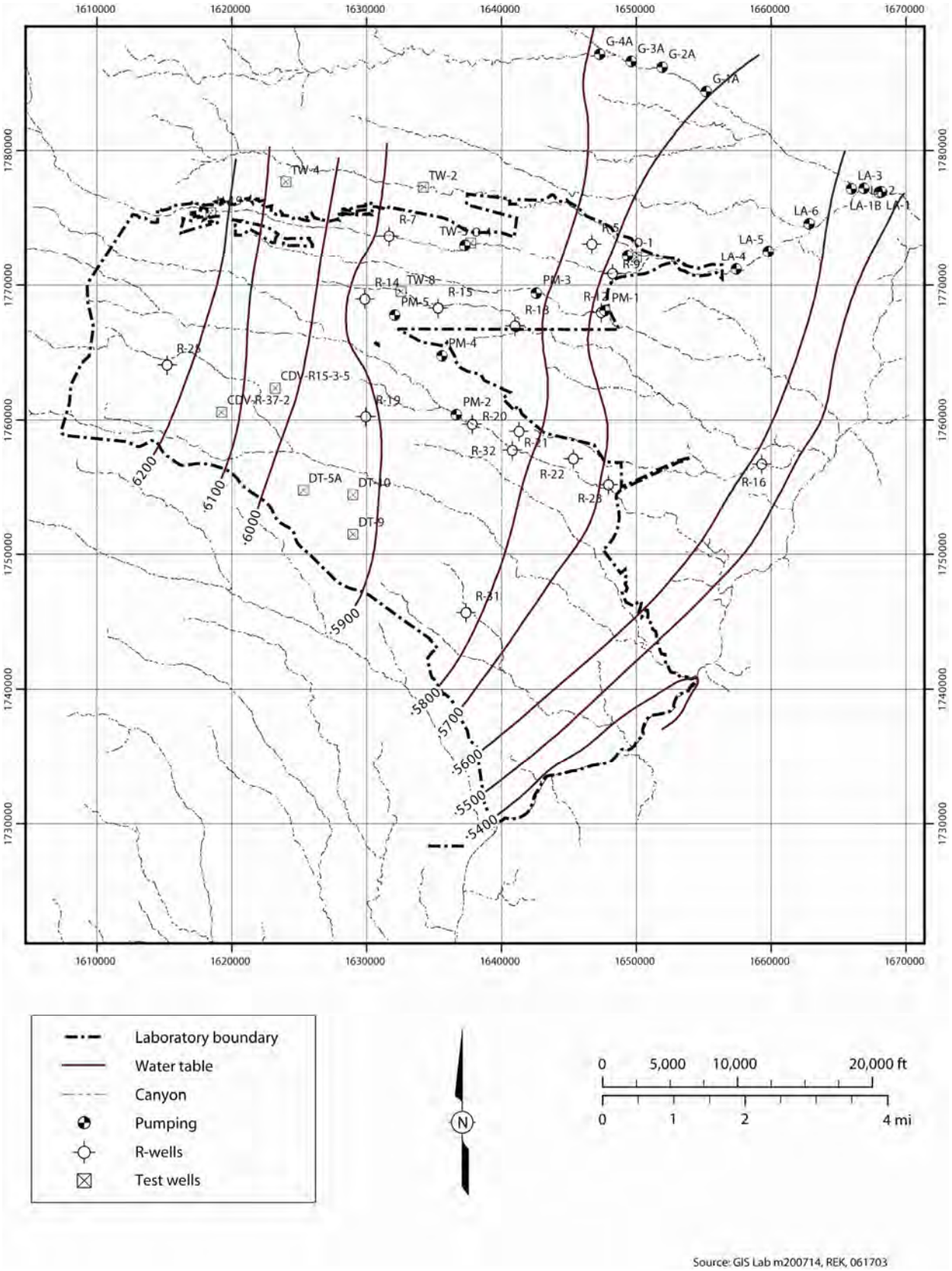


Figure 5.1-1 Depths to top of regional aquifer across the Laboratory

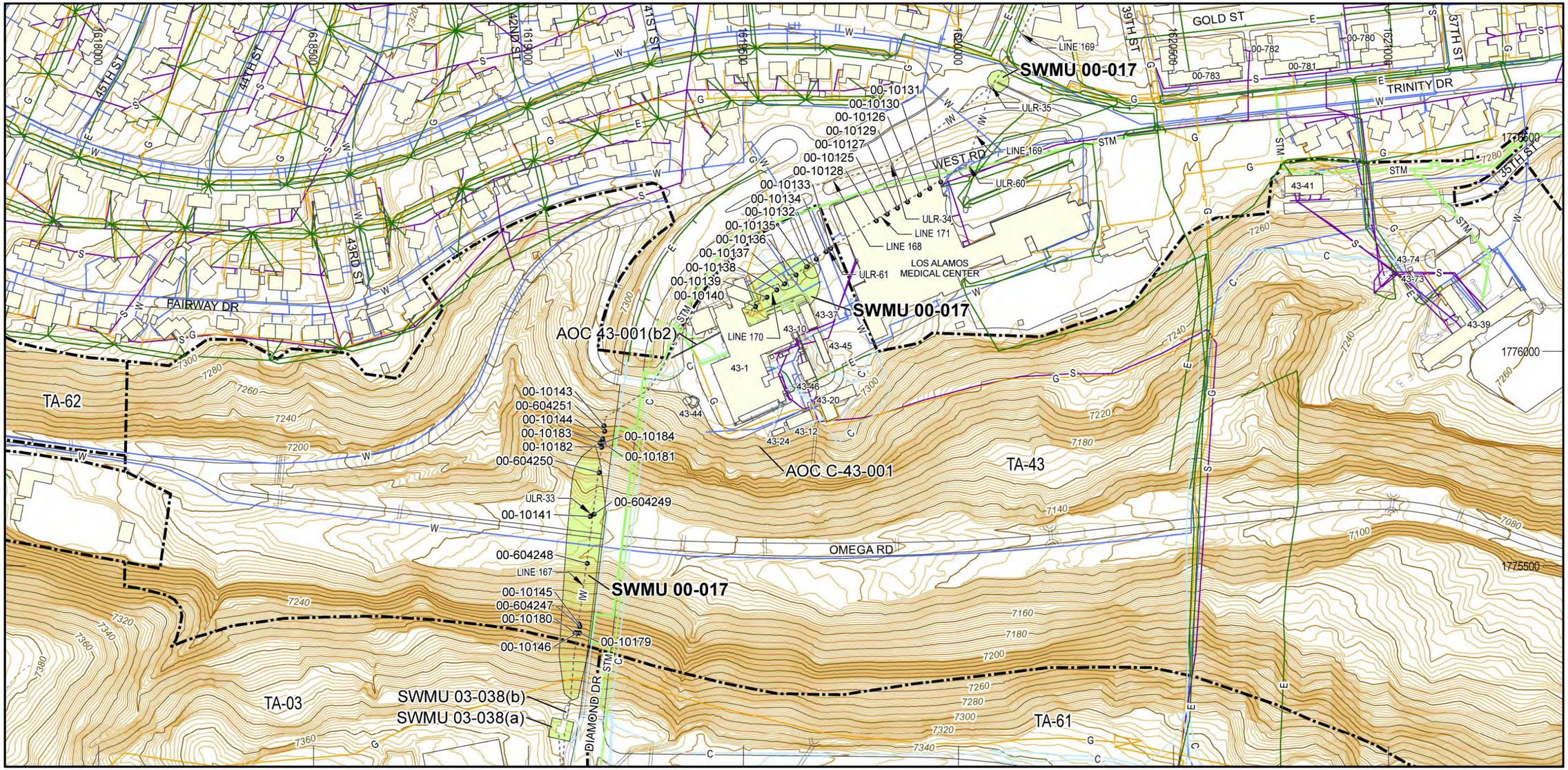


Figure 5.3-1 SWMU 00-017 site map and sampling locations

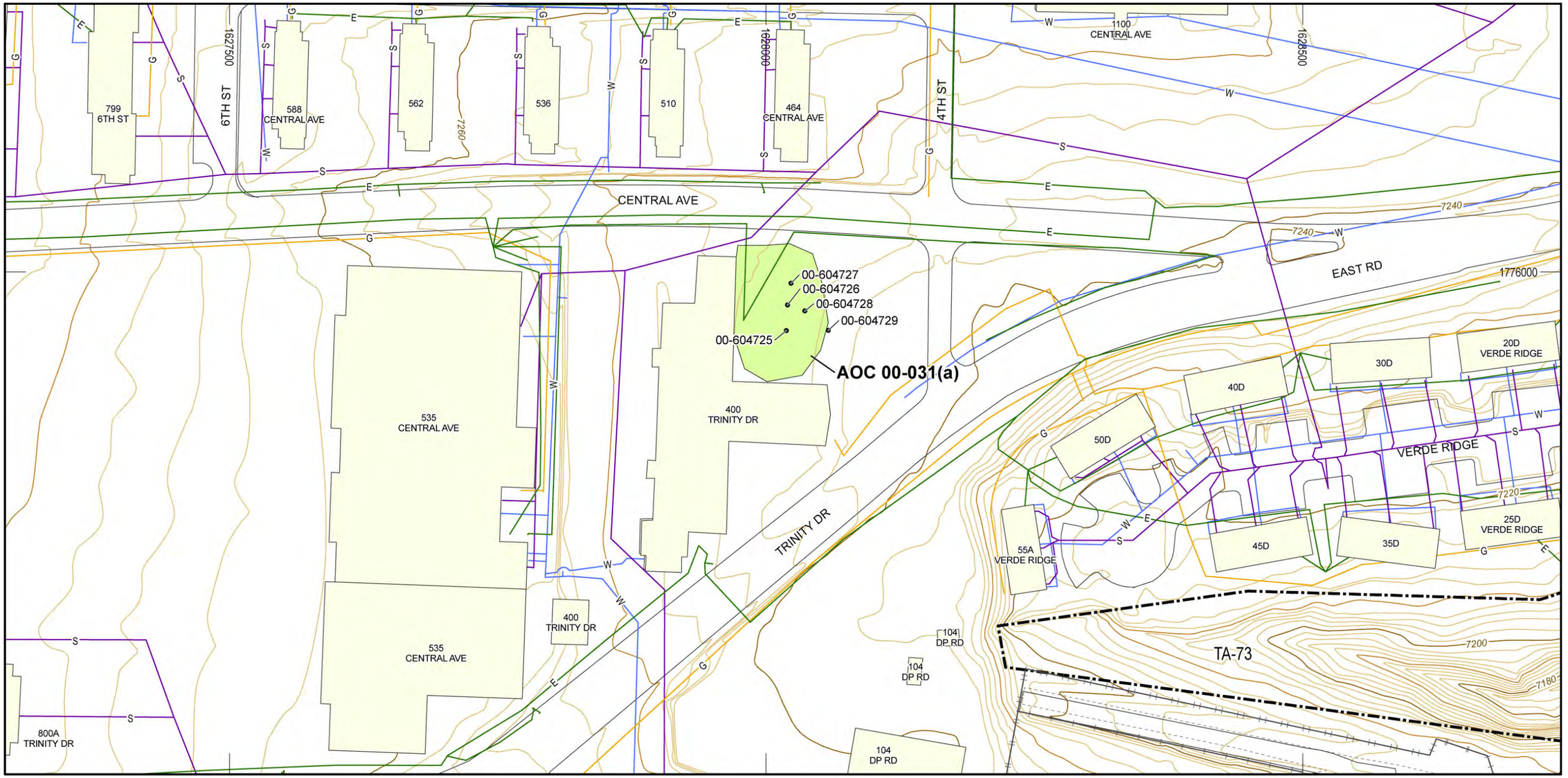


Figure 5.4-1 AOC 00-031(a) site map and sampling locations

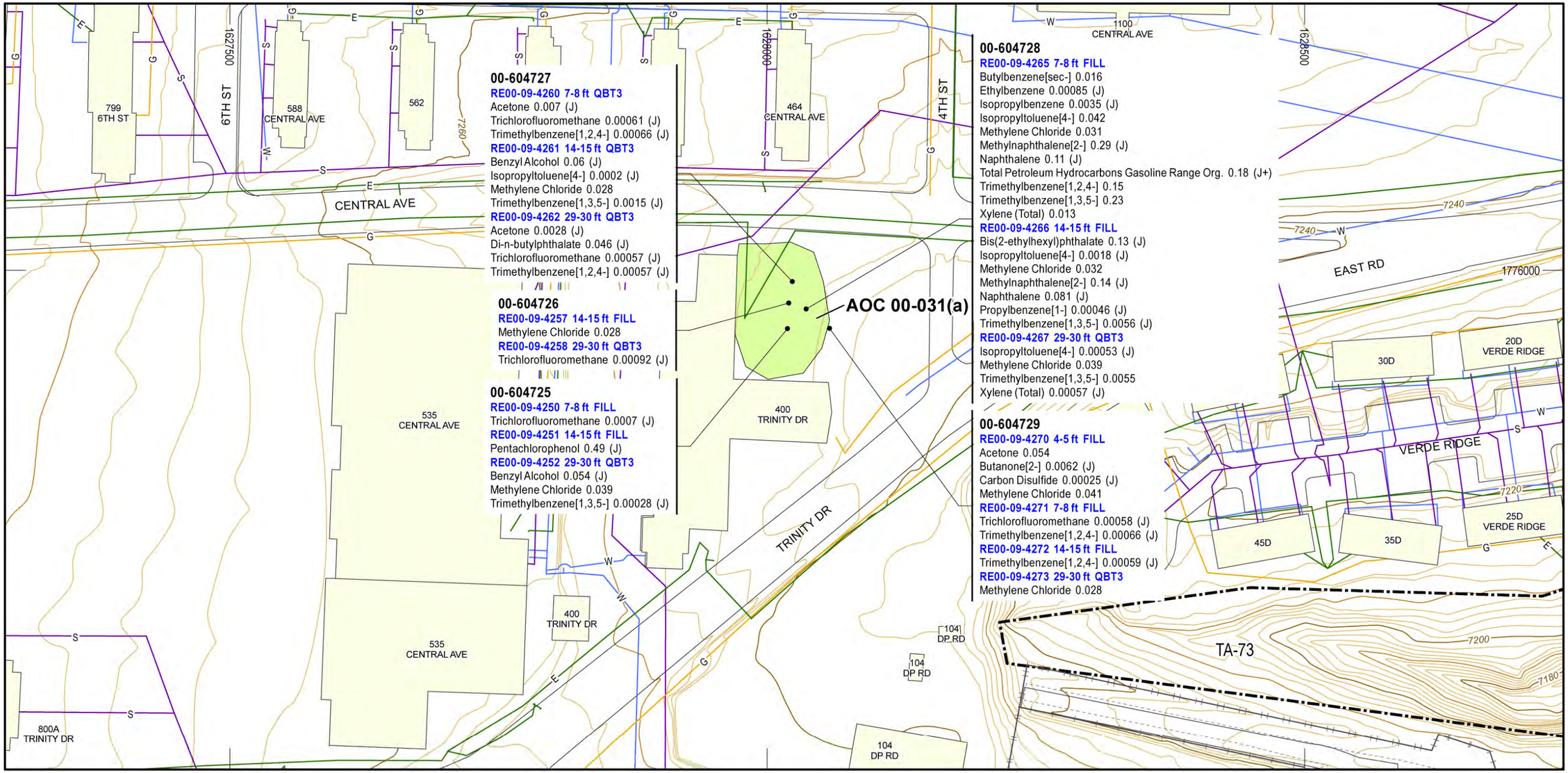


Figure 5.4-2 Organic COPCs detected at AOC 00-031(a)

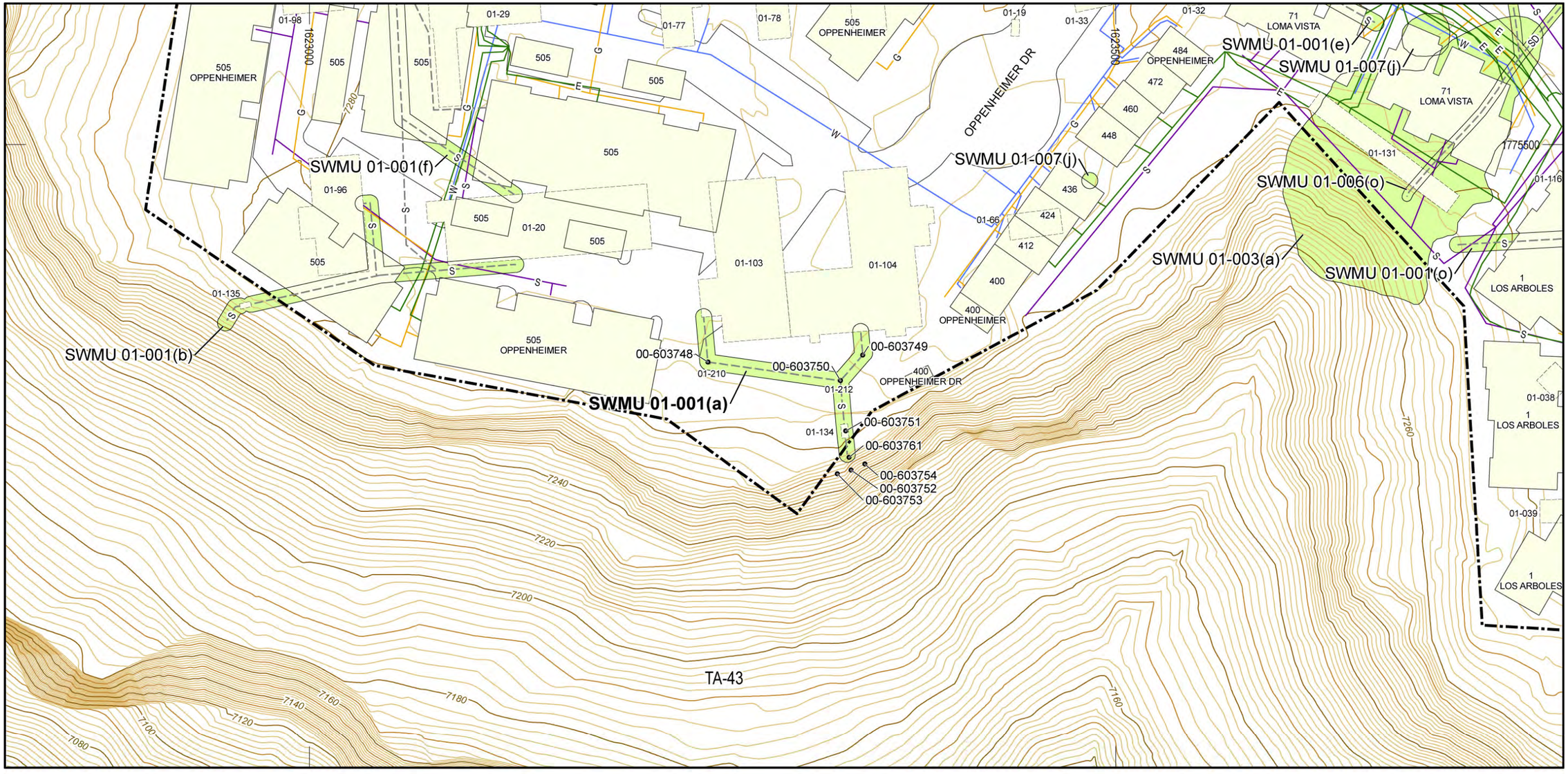


Figure 6.3-1 SWMU 01-001(a) site map and sampling locations

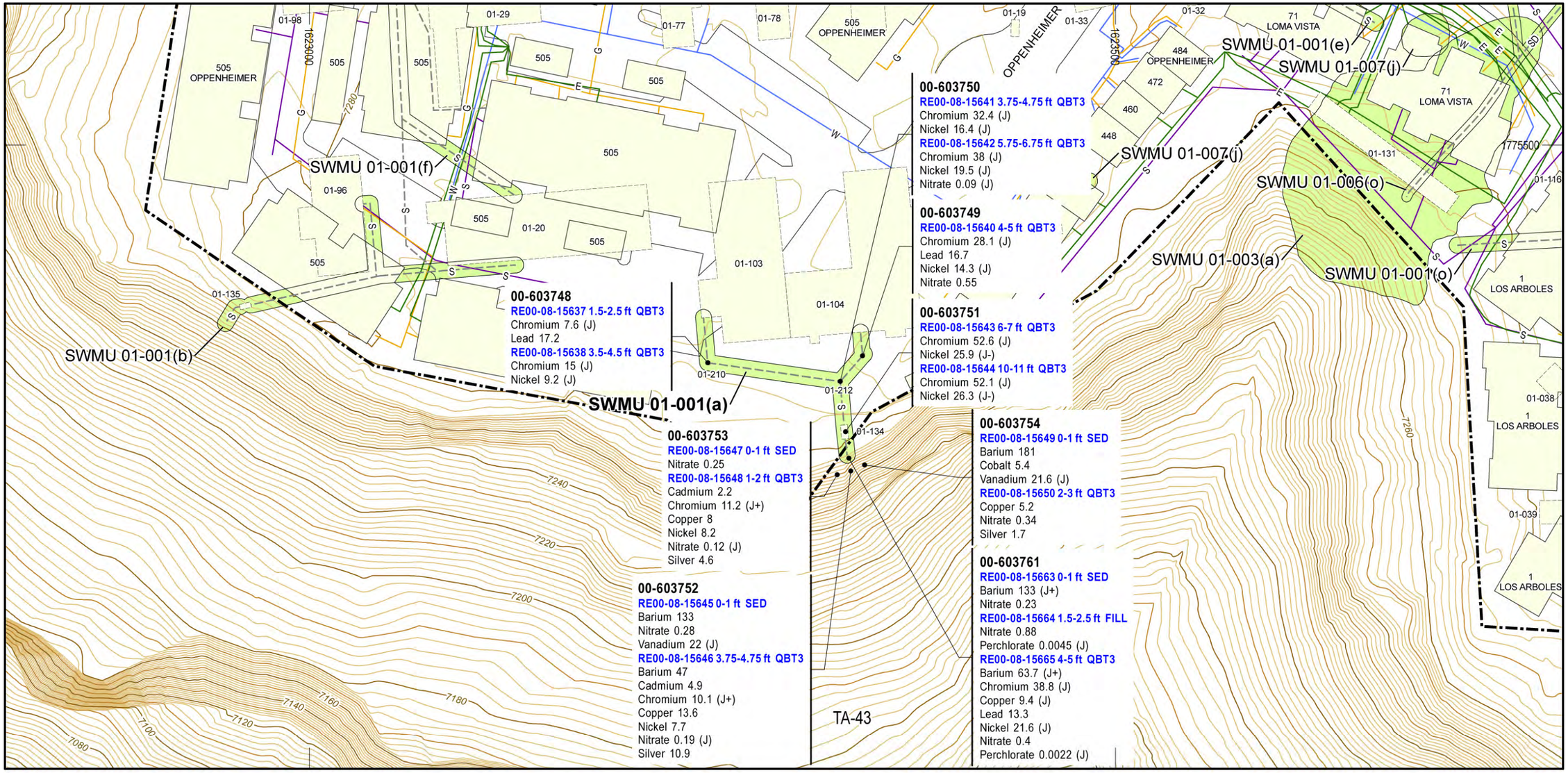


Figure 6.3-2 Inorganic COPCs detected or detected above BVs at SWMU 01-001(a)

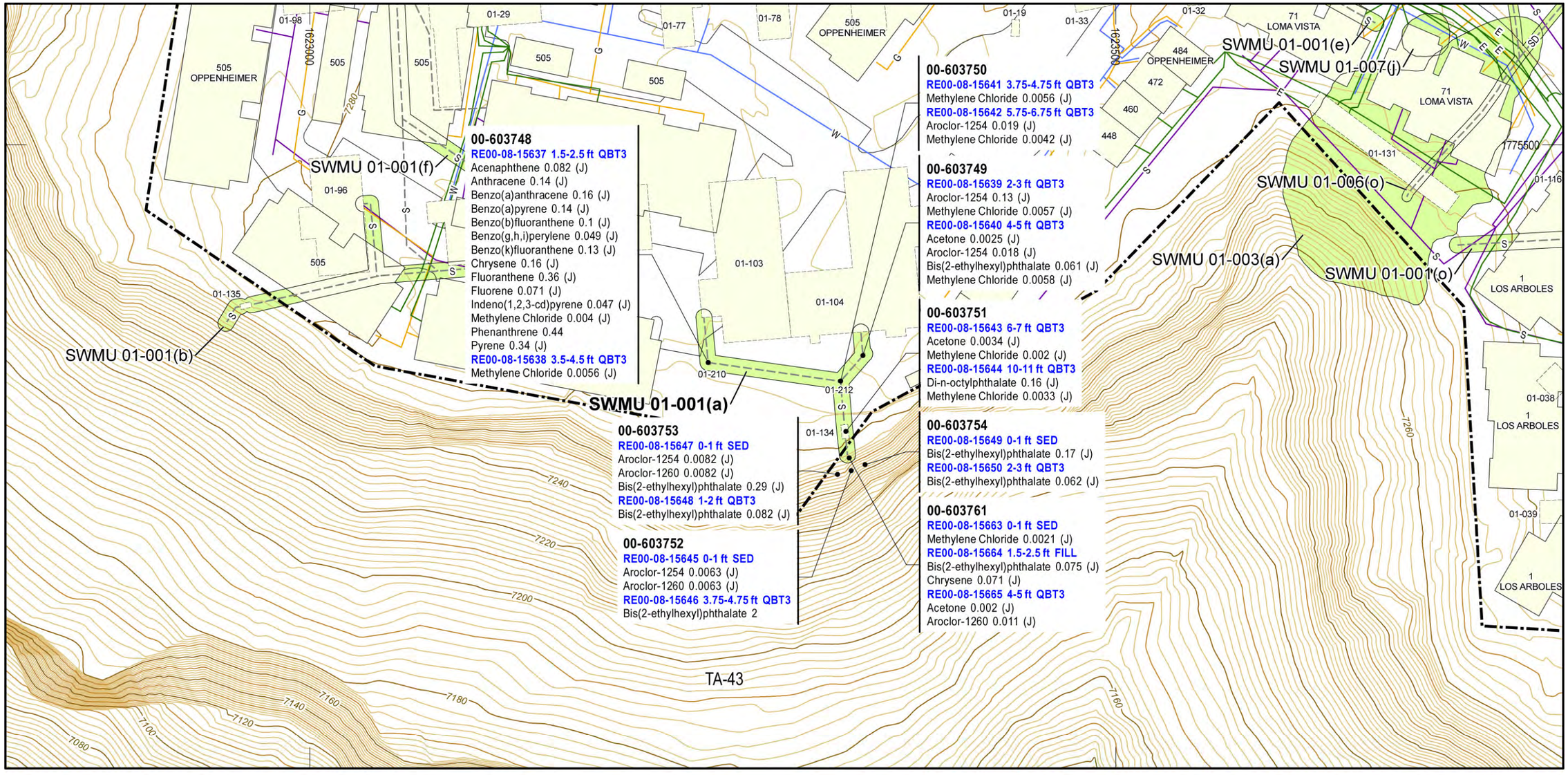


Figure 6.3-3 Organic COPCs detected at SWMU 01-001(a)

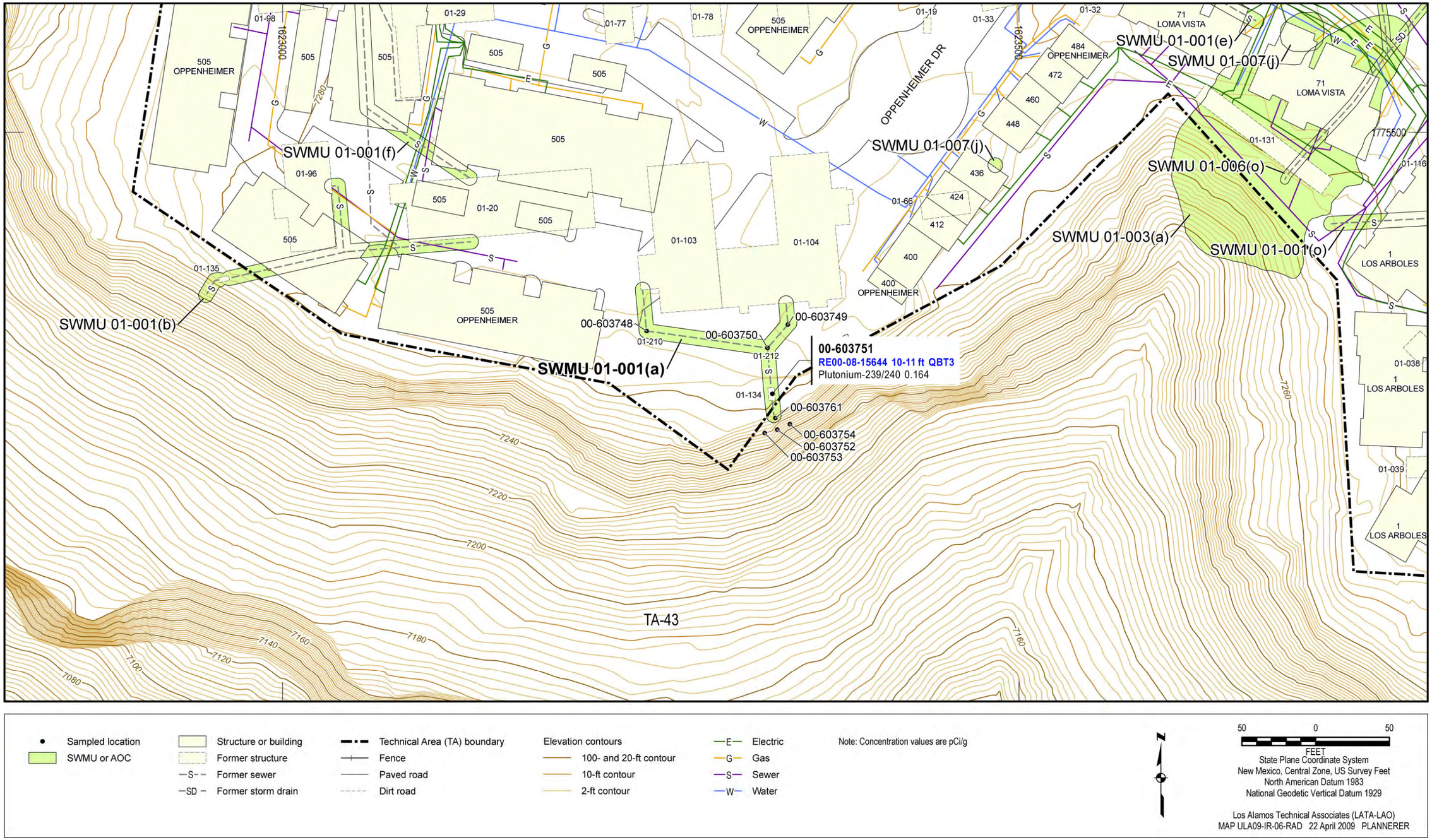


Figure 6.3-4 Radionuclide COPCs detected or detected above BVs/FVs at SWMU 01-001(a)

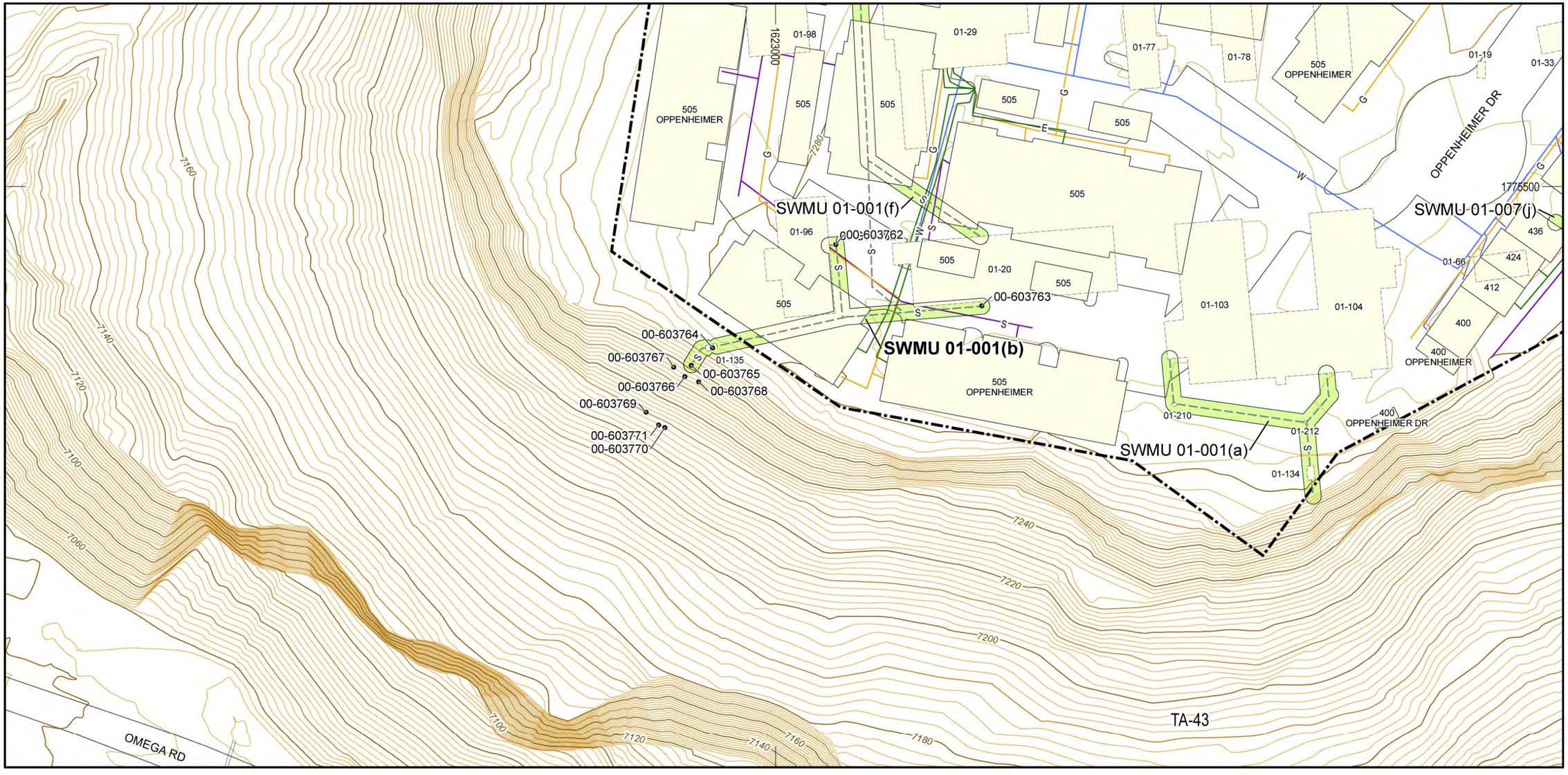


Figure 6.4-1 SWMU 01-001(b) site map and sampling locations

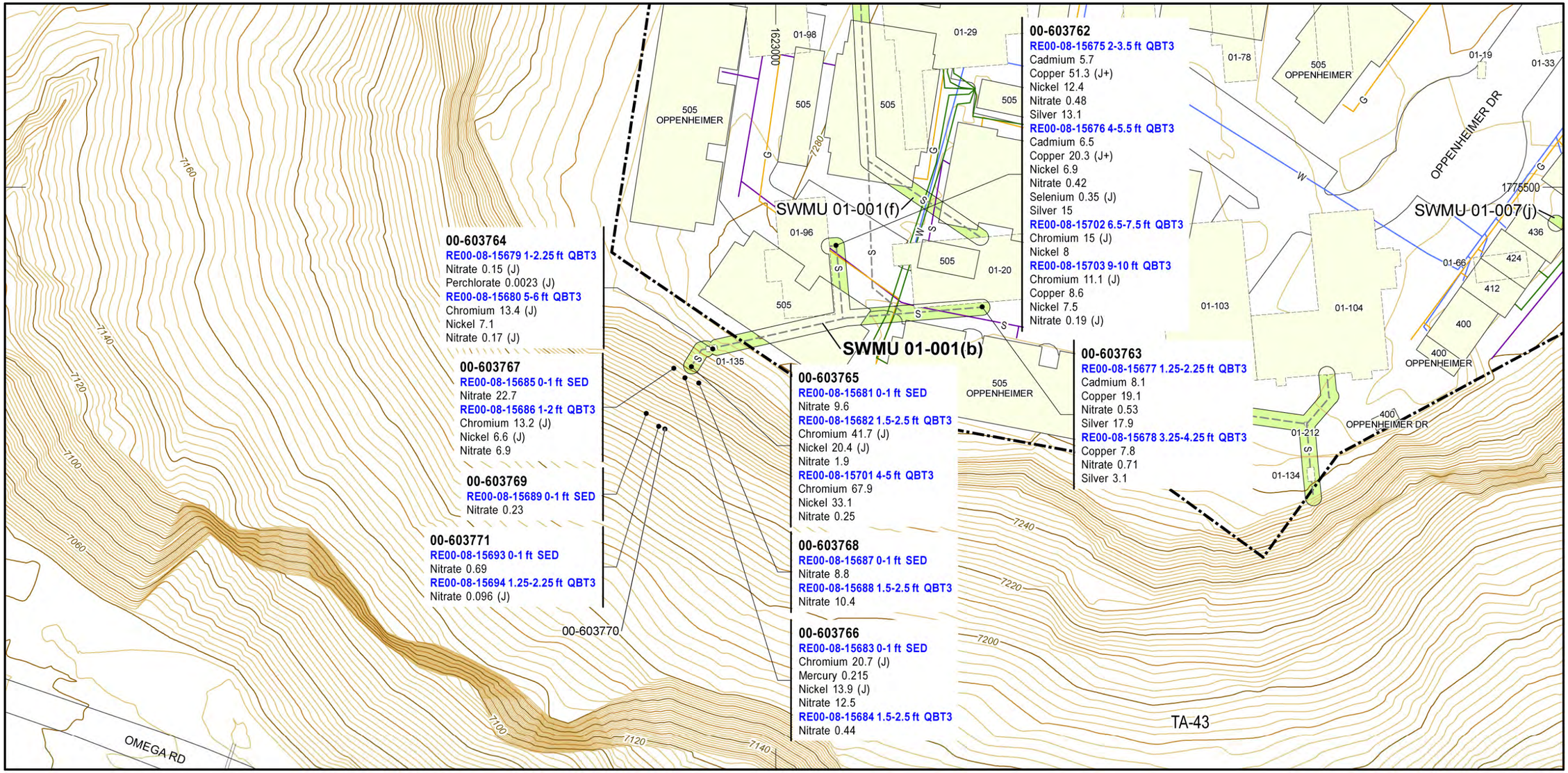


Figure 6.4-2 Inorganic COPCs detected or detected above BVs at SWMU 01-001(b)

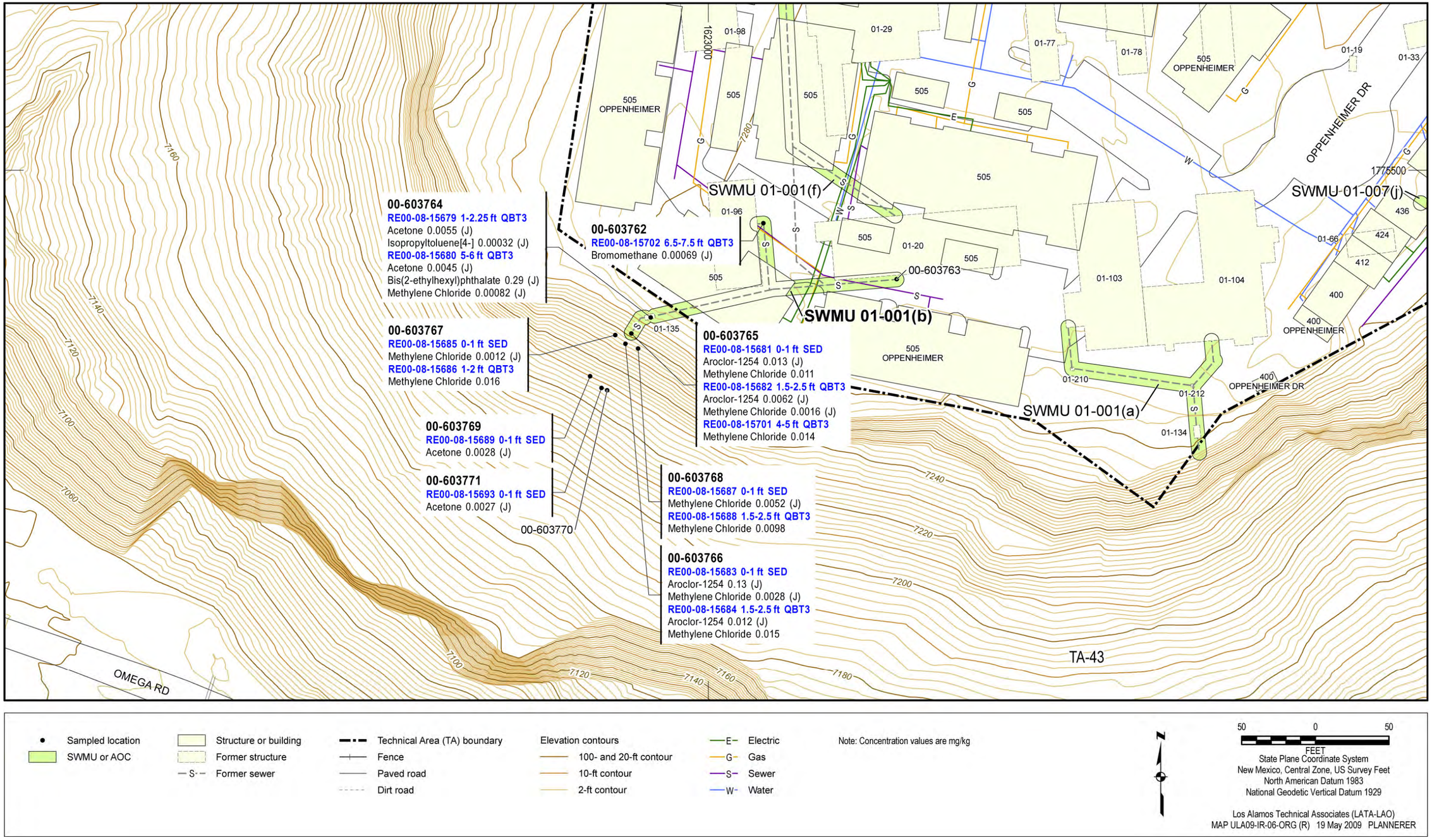


Figure 6.4-3 Organic COPCs detected at SWMU 01-001(b)

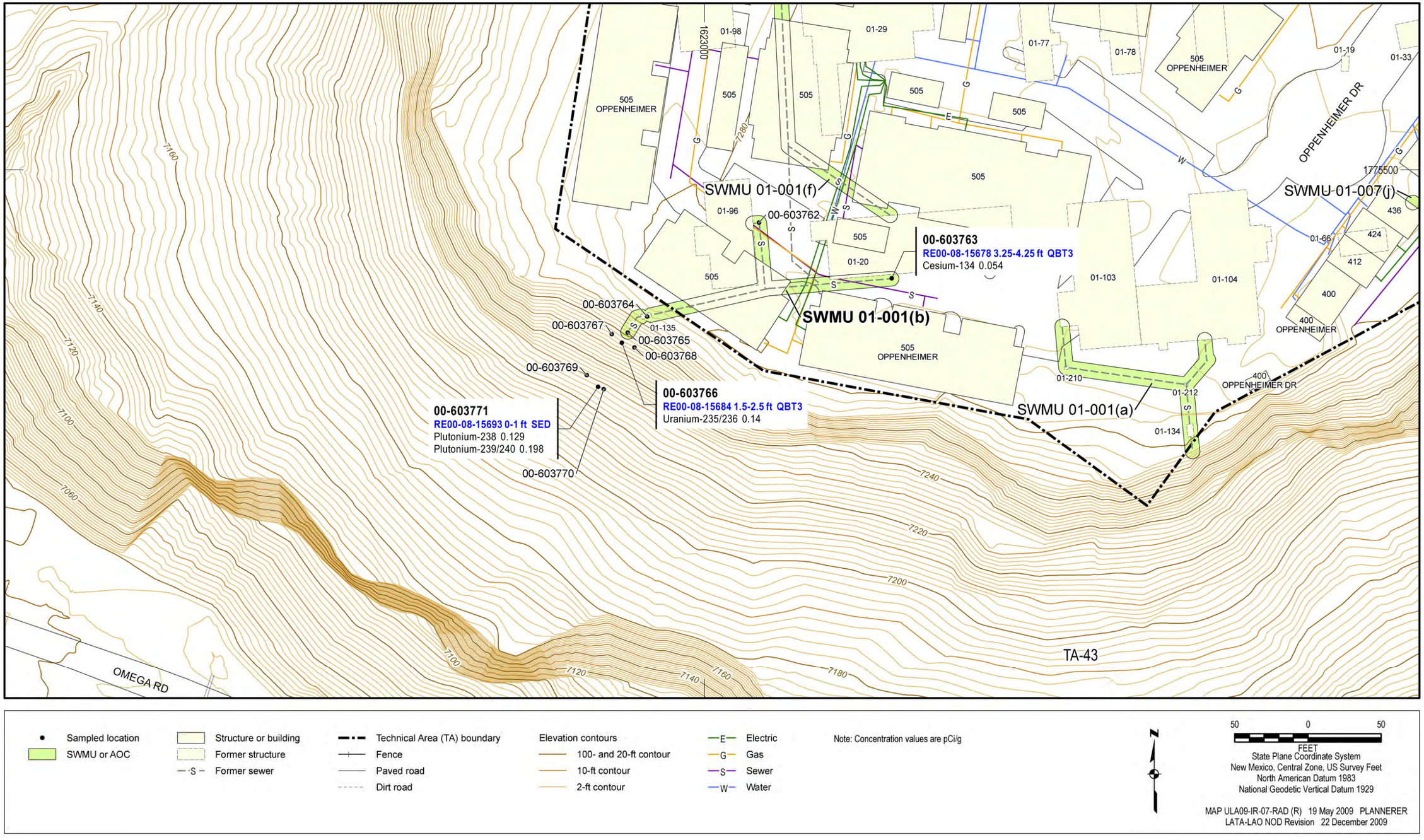


Figure 6.4-4 Radionuclide COPCs detected or detected above BVs/FVs at SWMU 01-001(b)

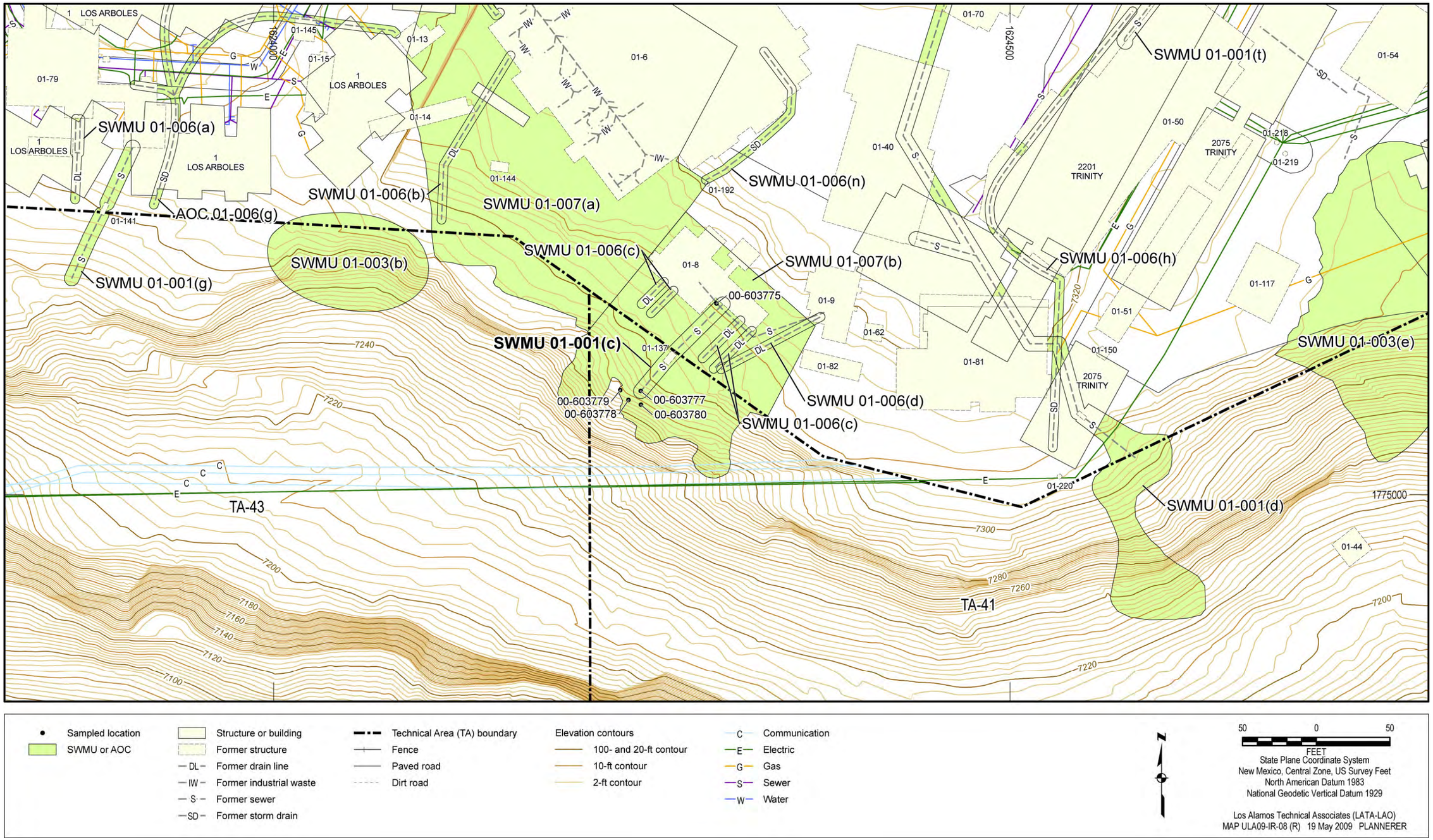


Figure 6.5-1 SWMU 01-001(c) site map and sampling locations

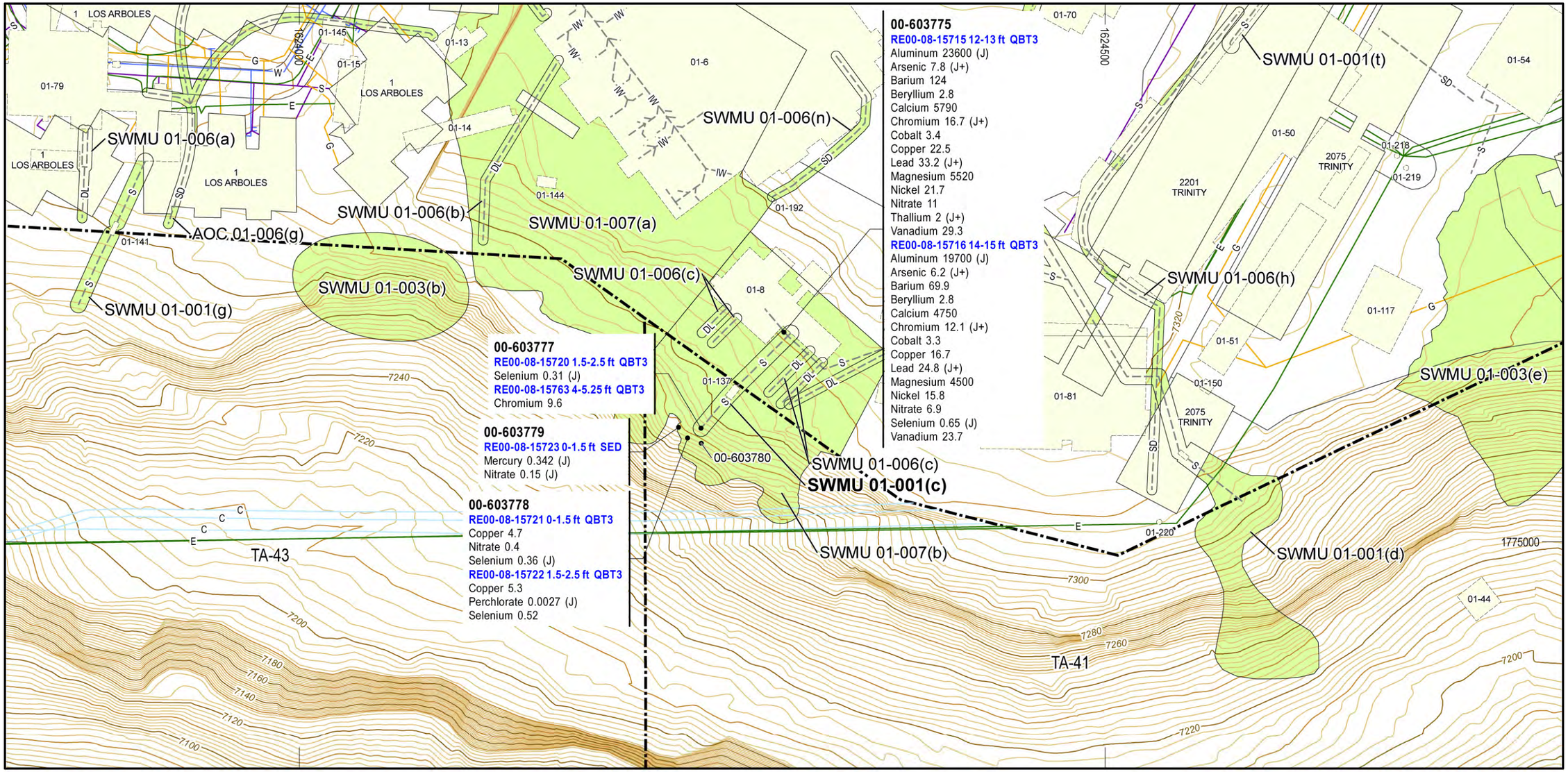


Figure 6.5-2 Inorganic COPCs detected or detected above BVs at SWMU 01-001(c)

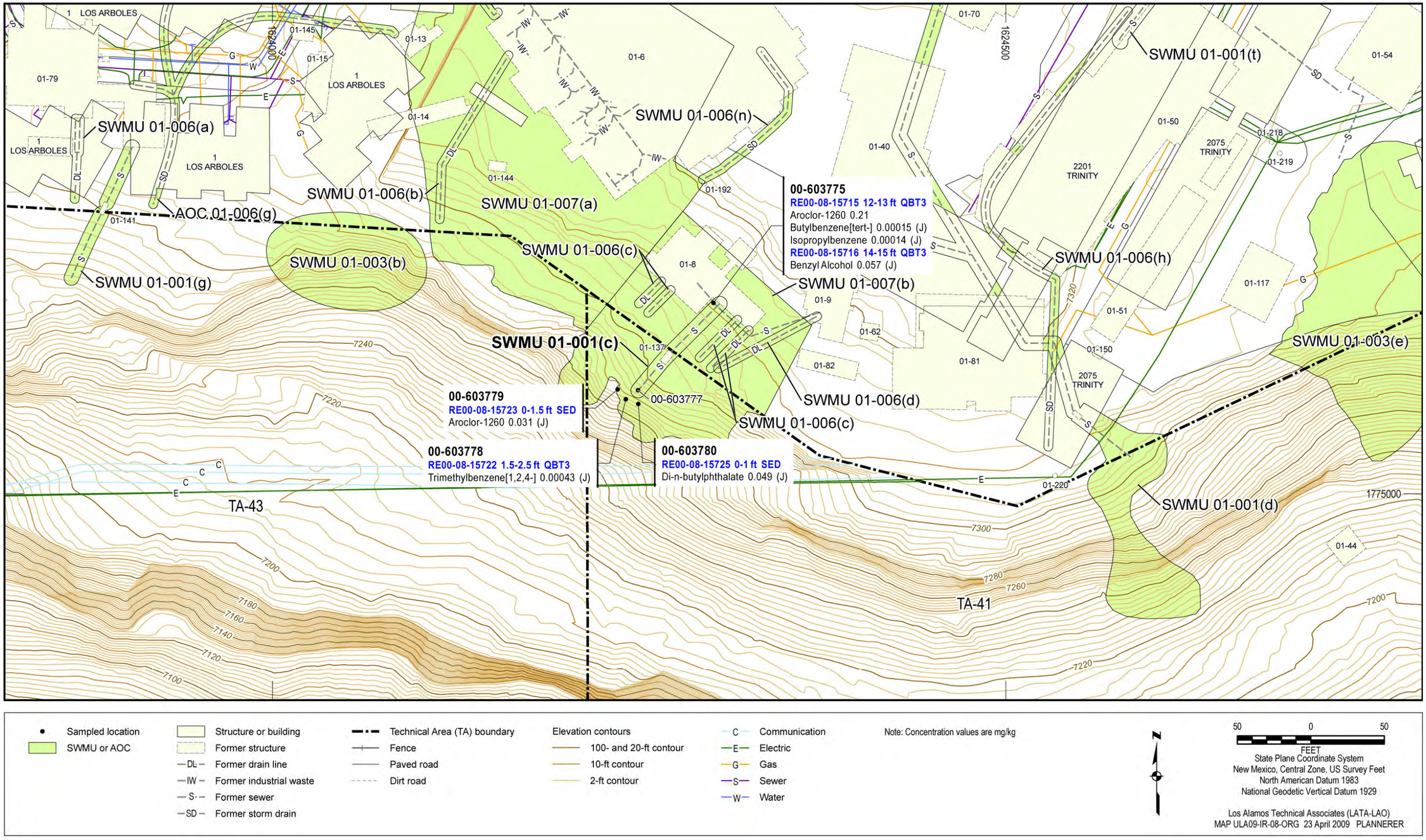


Figure 6.5-3 Organic COPCs detected at SWMU 01-001(c)

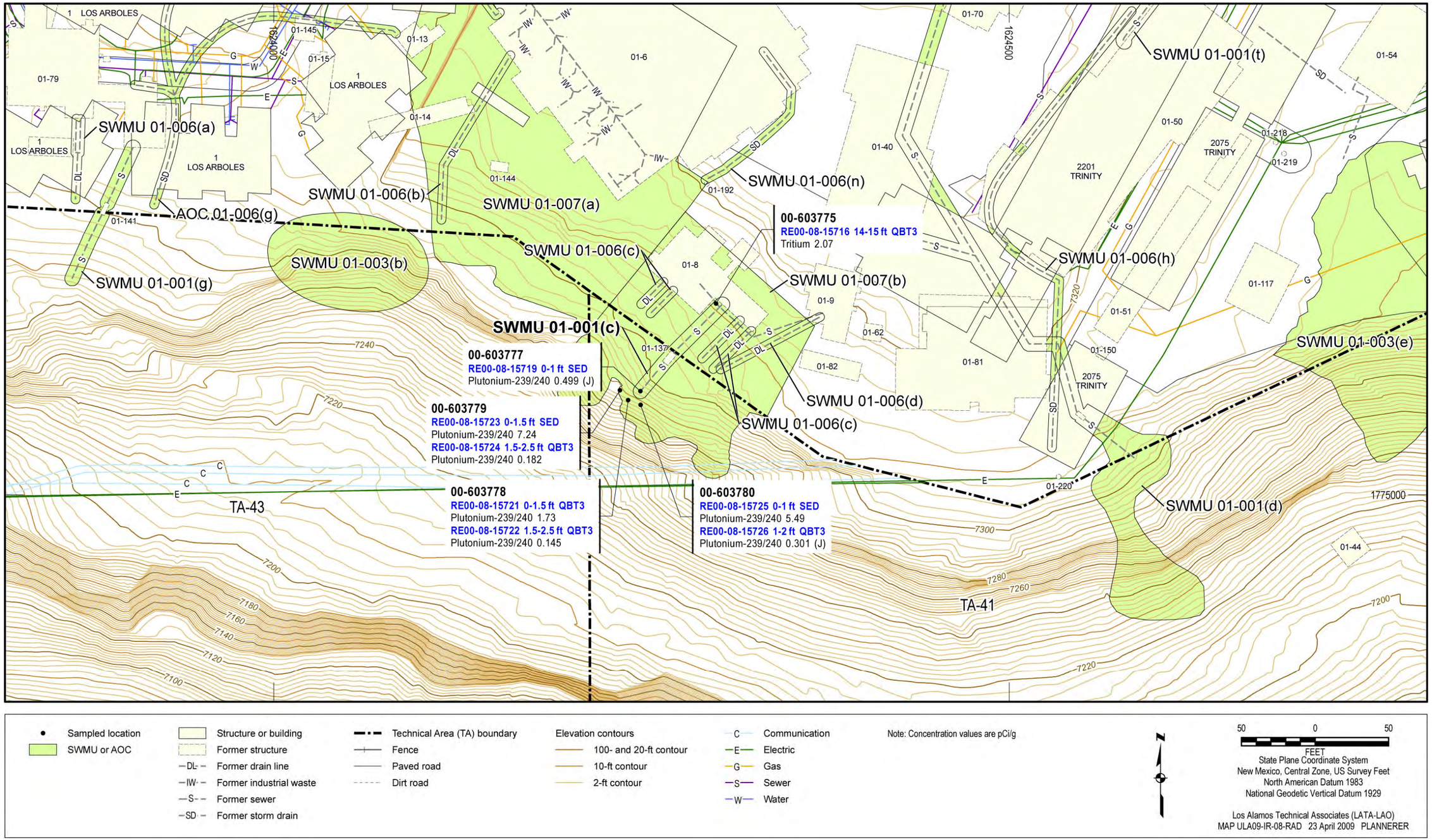


Figure 6.5-4 Radionuclide COPCs detected or detected above BVs/FVs at SWMU 01-001(c)

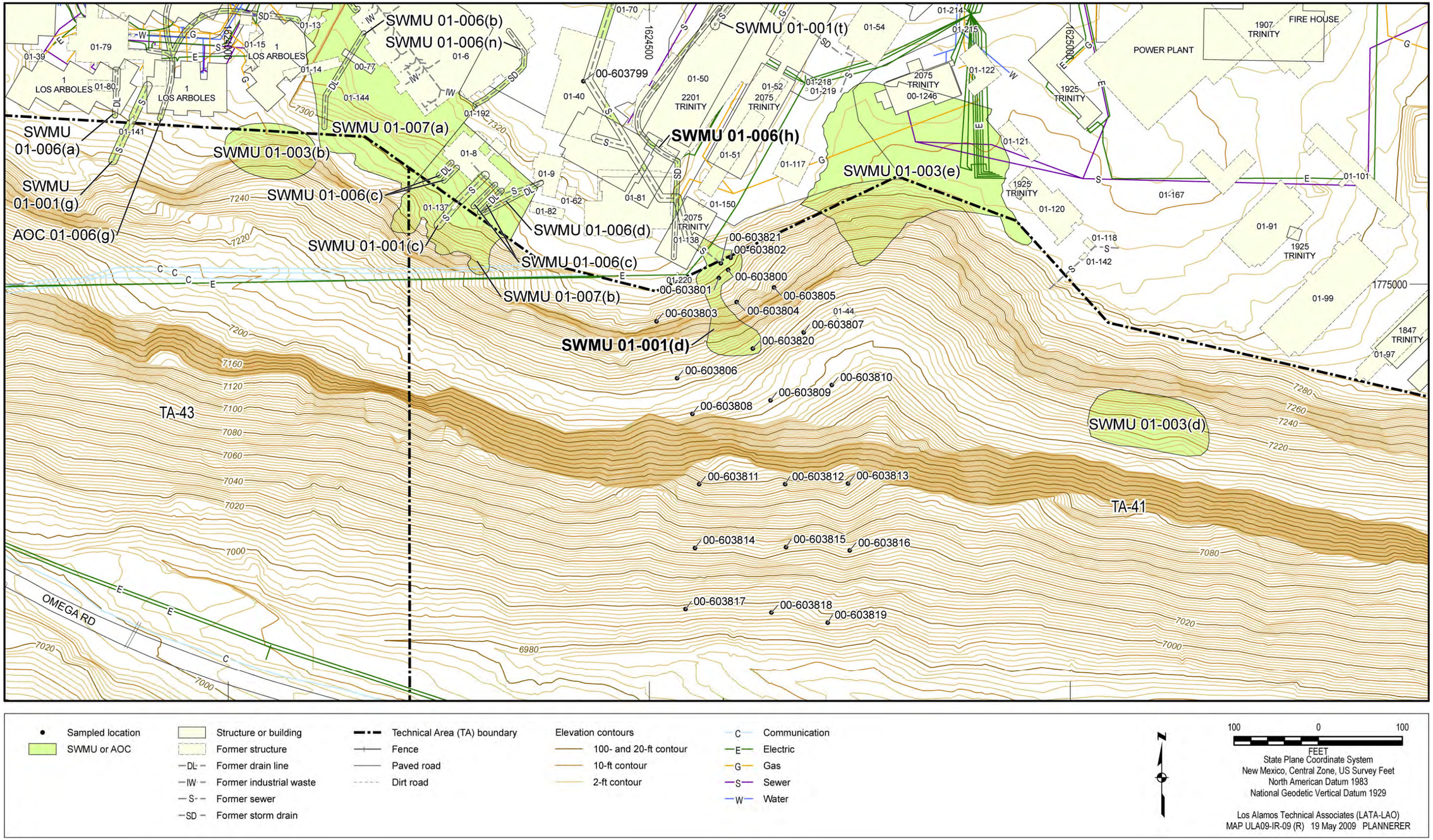


Figure 6.6-1 SWMUs 01-001(d) and 01-006(h) site map and sampling locations

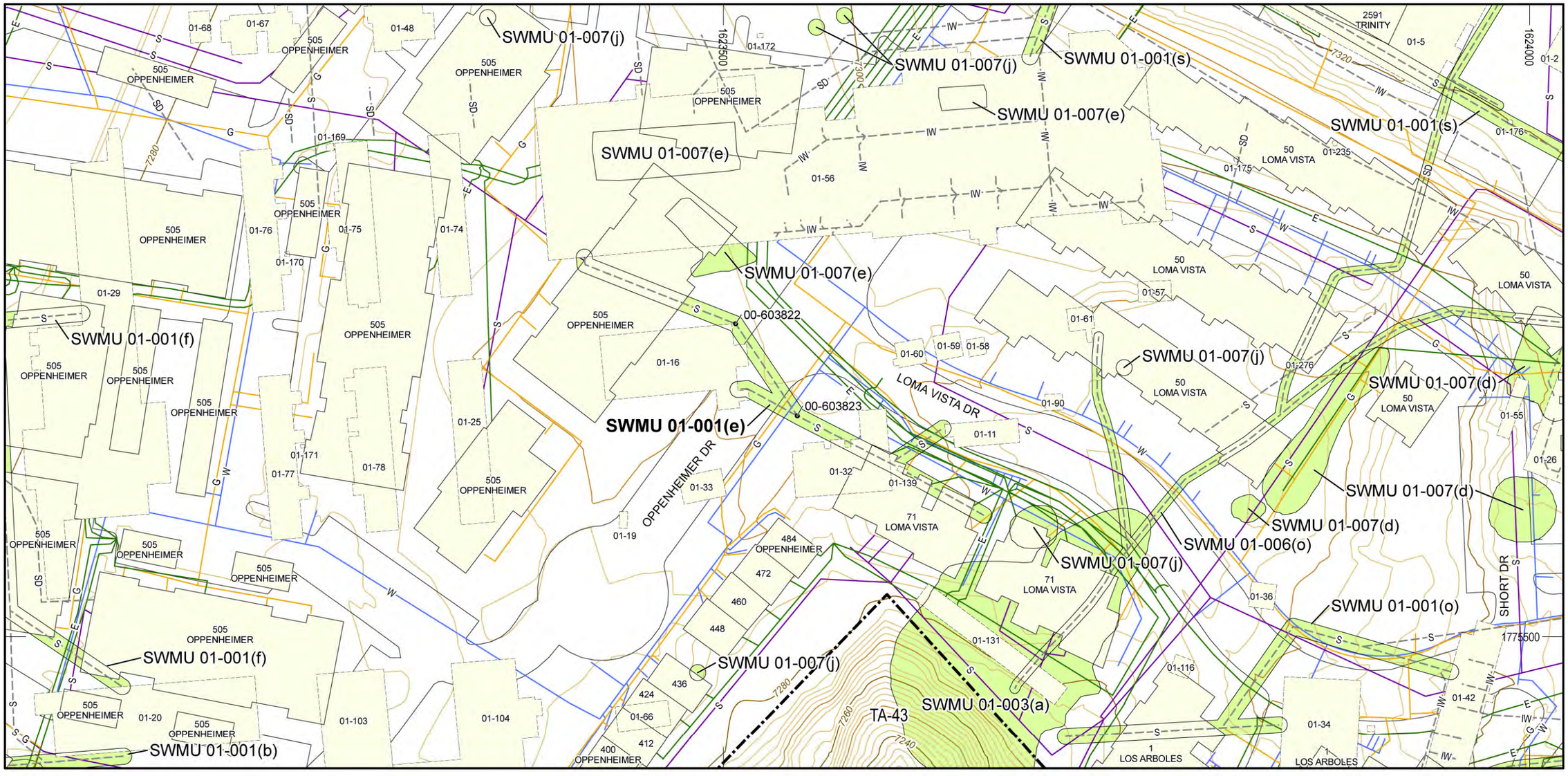


Figure 6.7-1 SWMU 01-001(e) site map and sampling locations

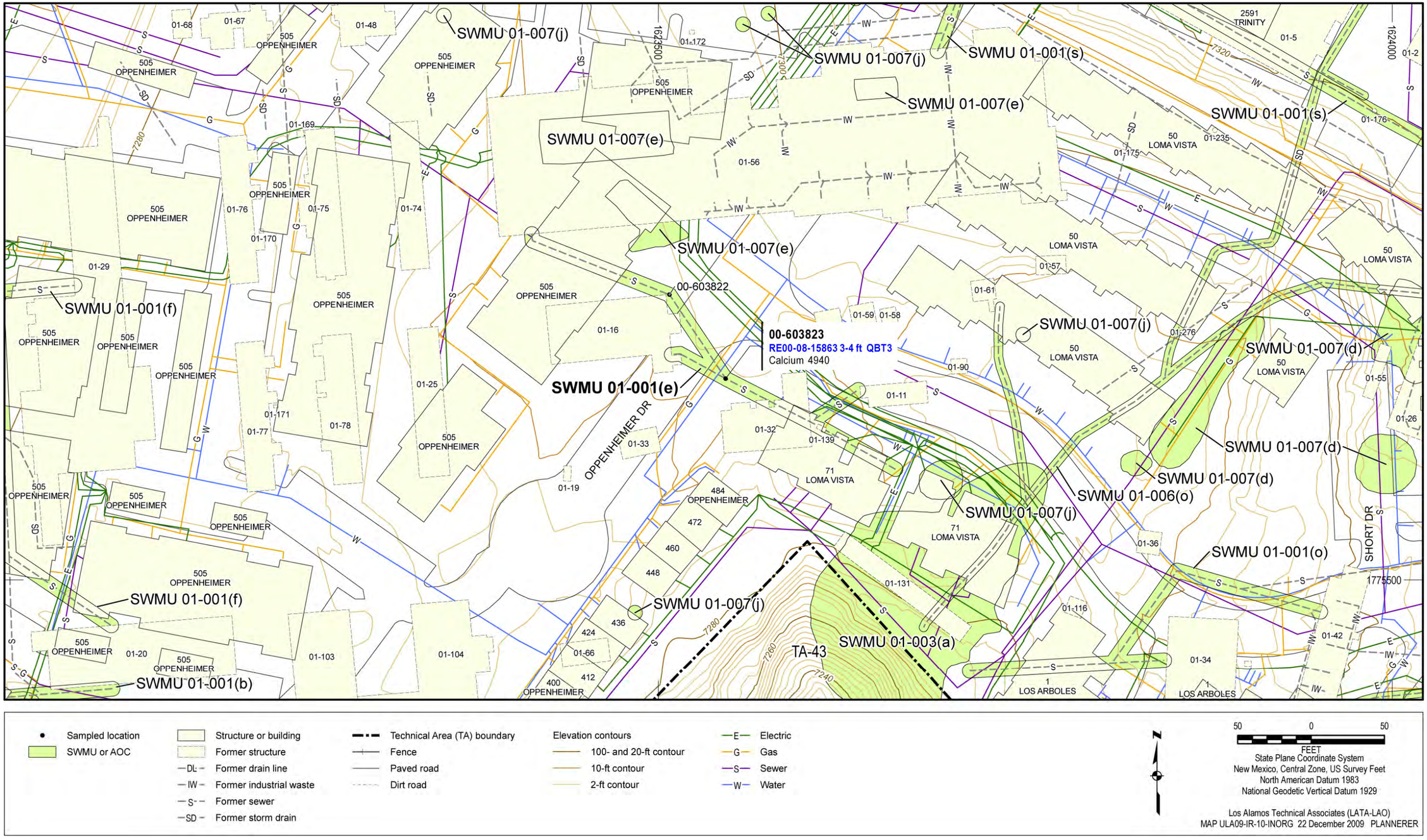


Figure 6.7-2 Inorganic COPCs detected or detected above BVs at SWMU 01-001(e)

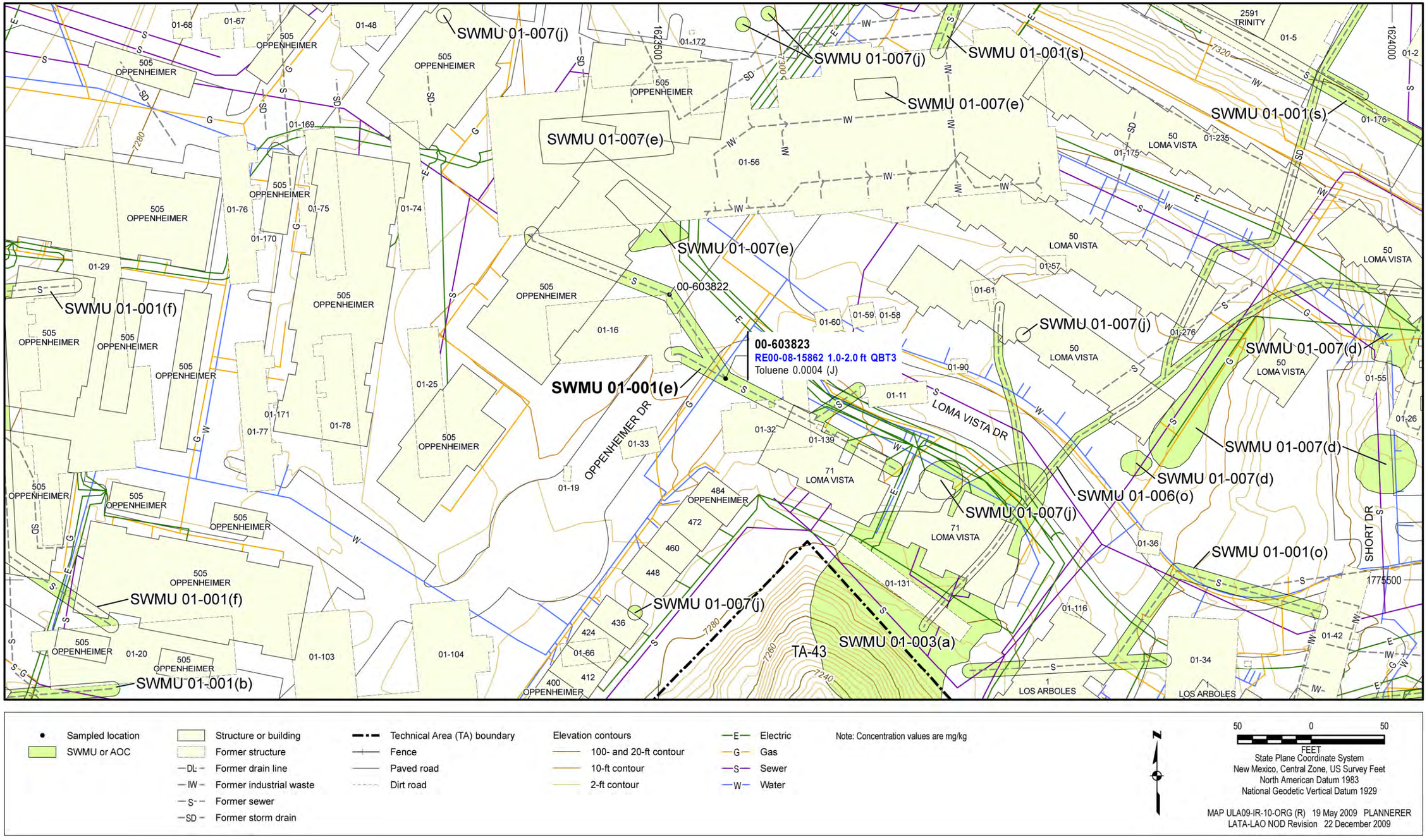


Figure 6.7-3 Organic COPCs detected at SWMU 01-001(e)

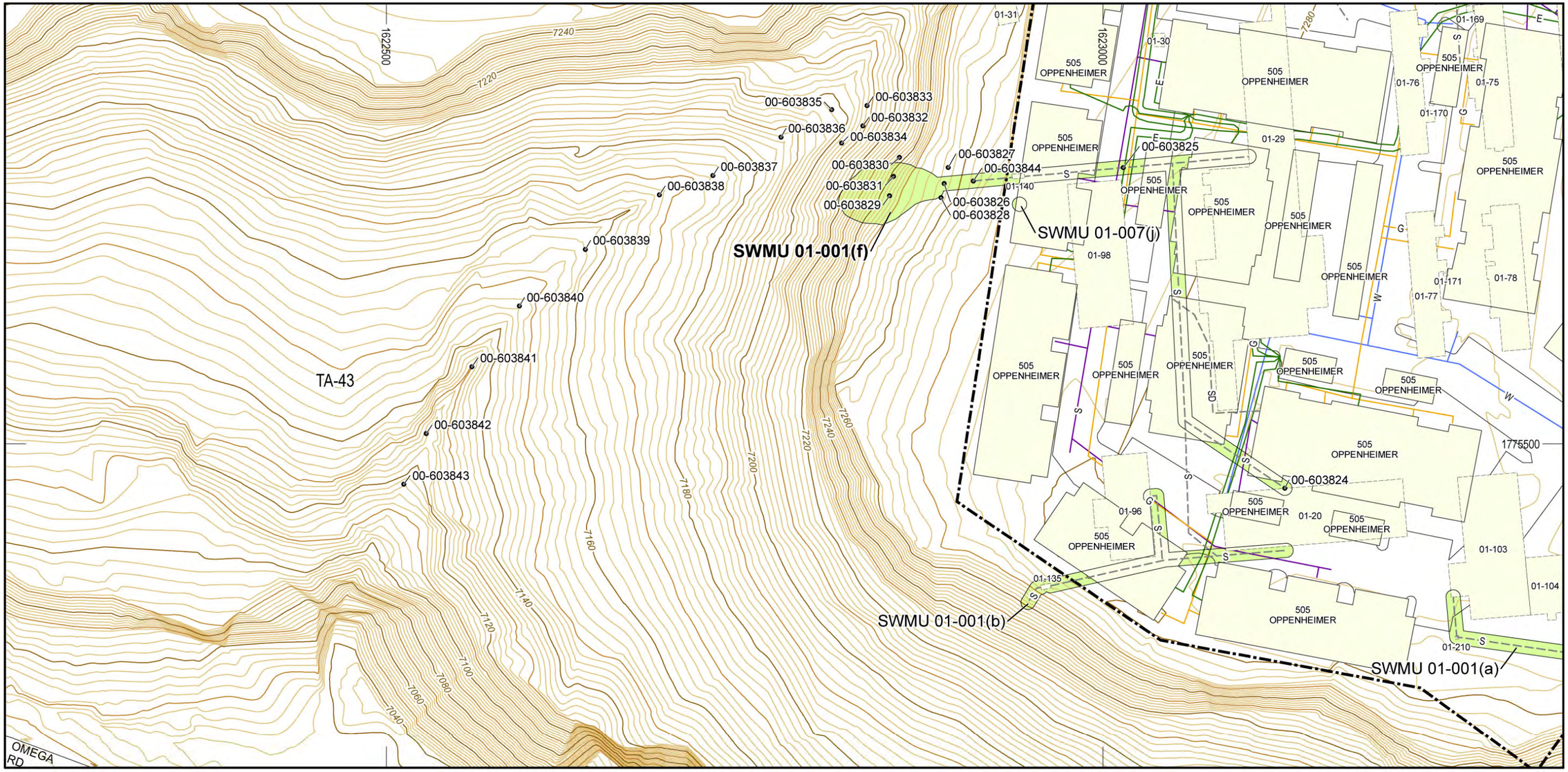


Figure 6.8-1 SWMU 01-001(f) site map and sampling locations

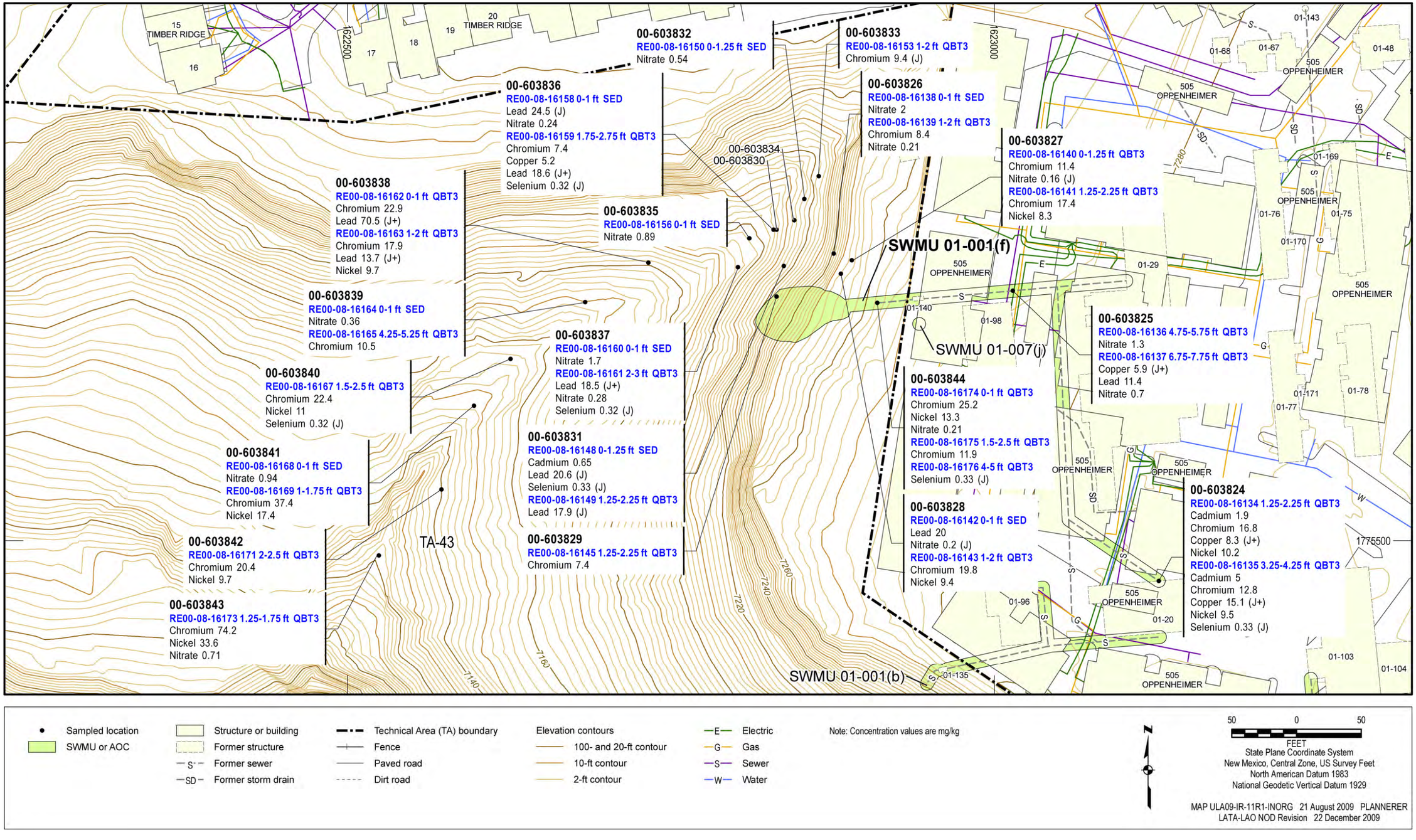


Figure 6.8-2 Inorganic COPCs detected or detected above BVs at SWMU 01-001(f)

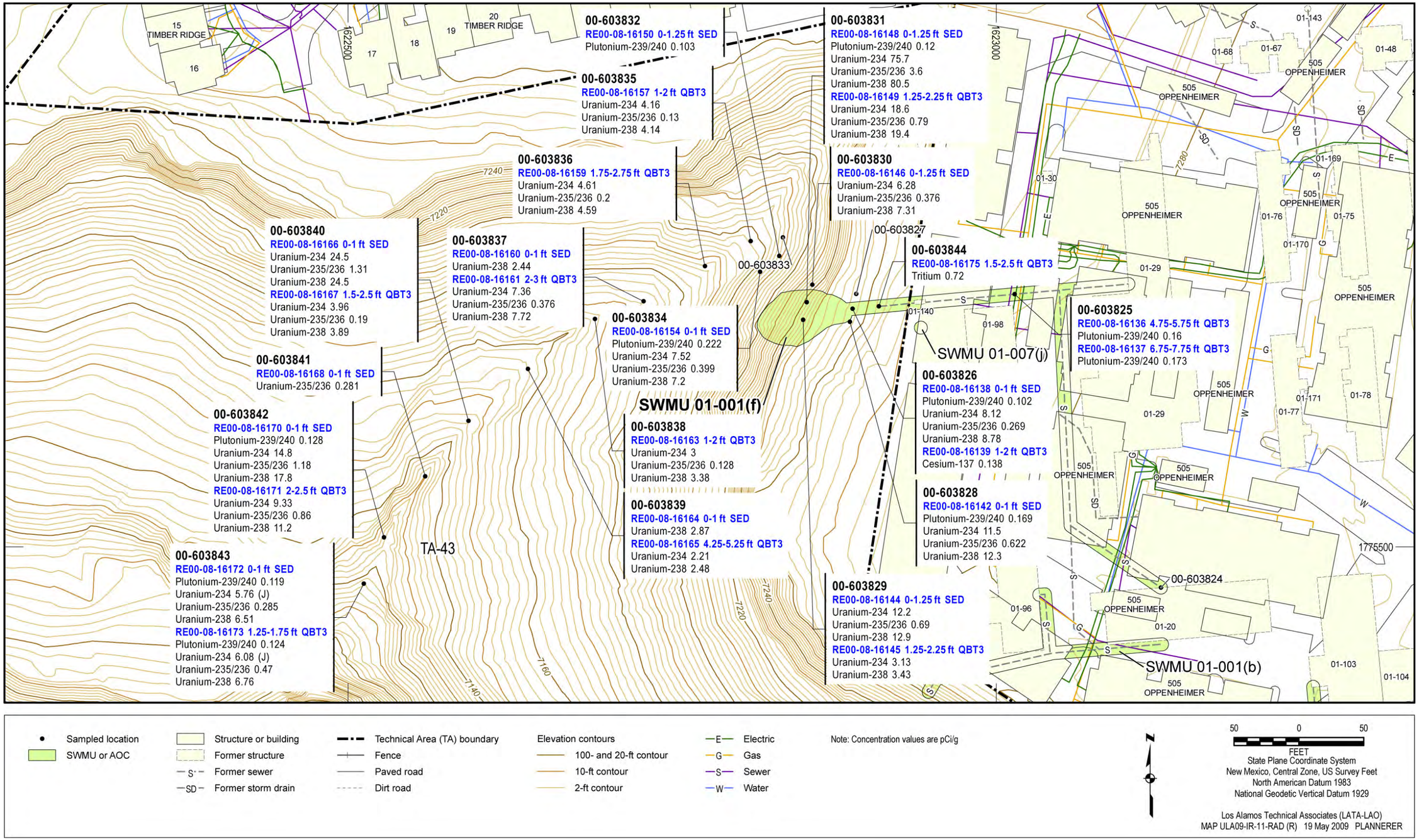


Figure 6.8-3 Radionuclide COPCs detected or detected above BVs/FVs at SWMU 01-001(f)

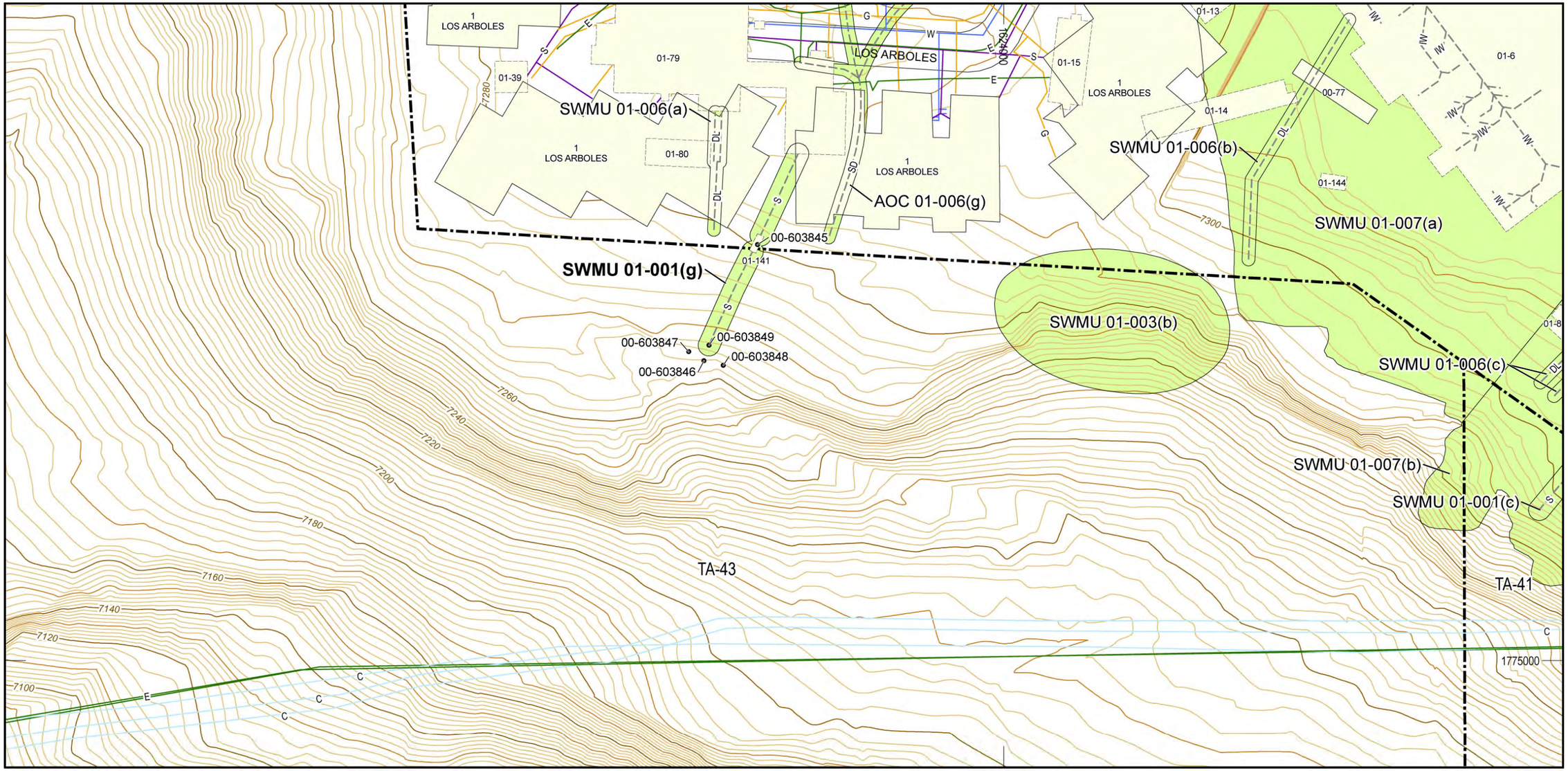


Figure 6.9-1 SWMU 01-001(g) site map and sampling locations

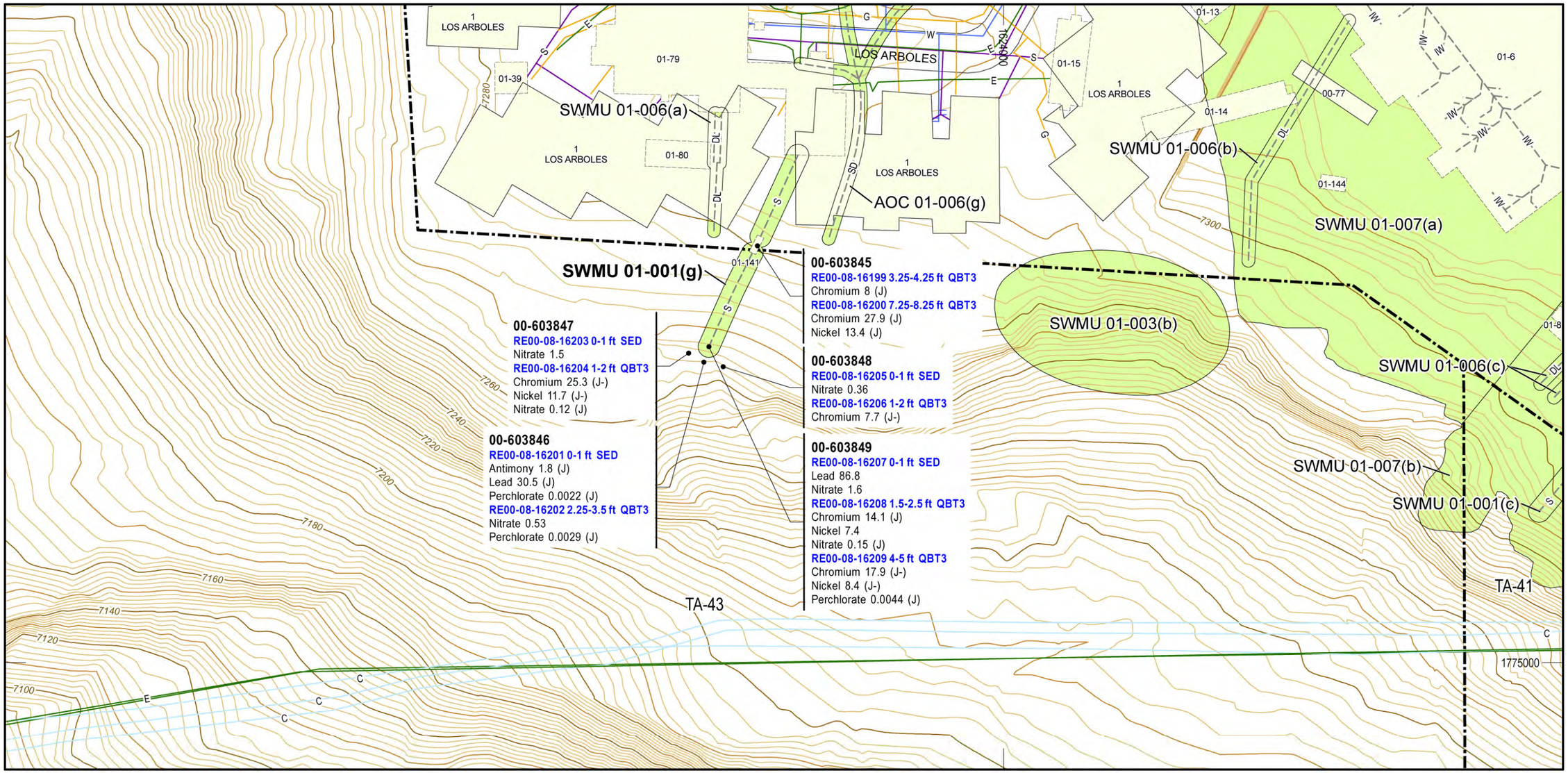


Figure 6.9-2 Inorganic COPCs detected or detected above BVs at SWMU 01-001(g)

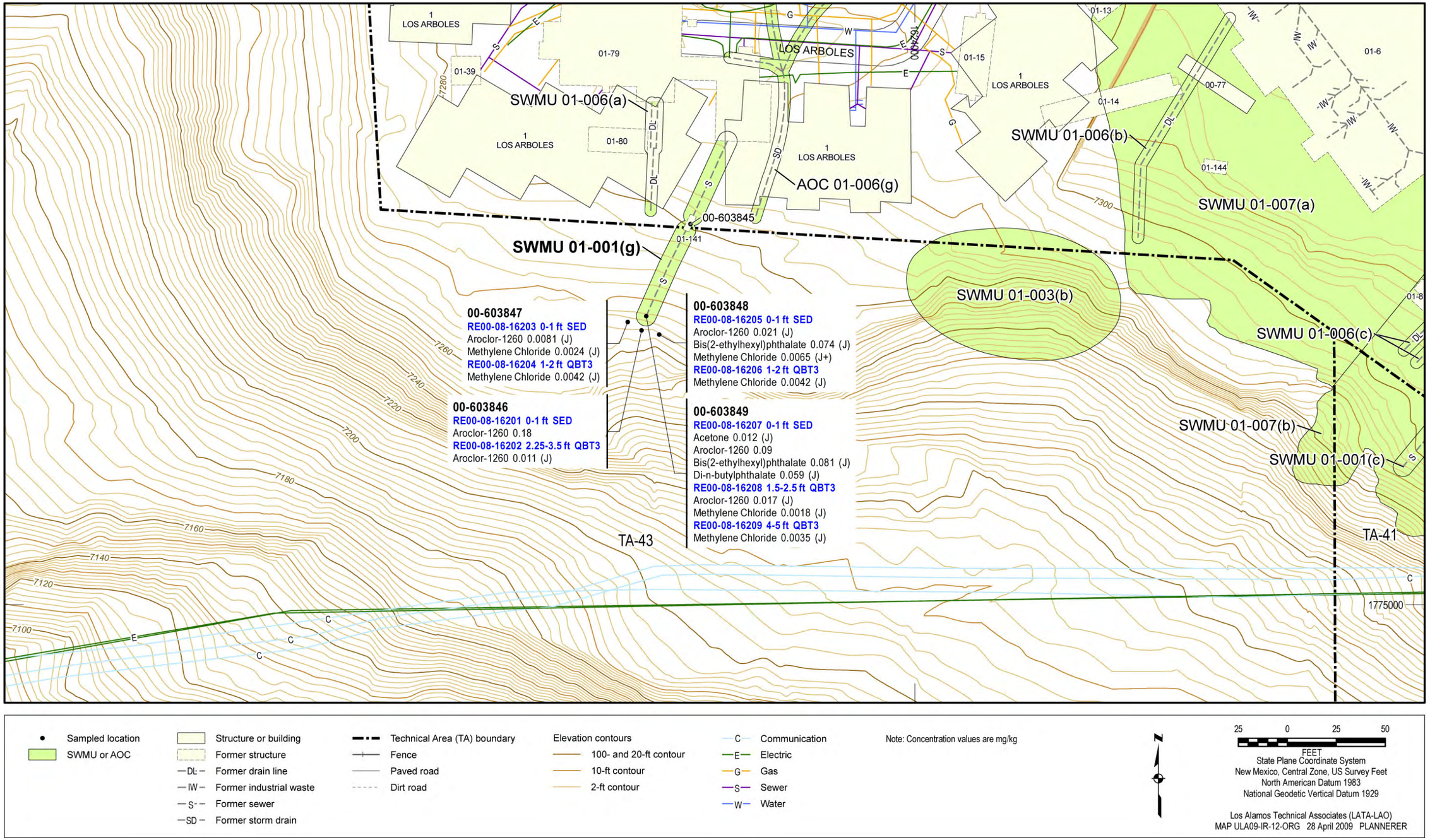


Figure 6.9-3 Organic COPCs detected at SWMU 01-001(g)

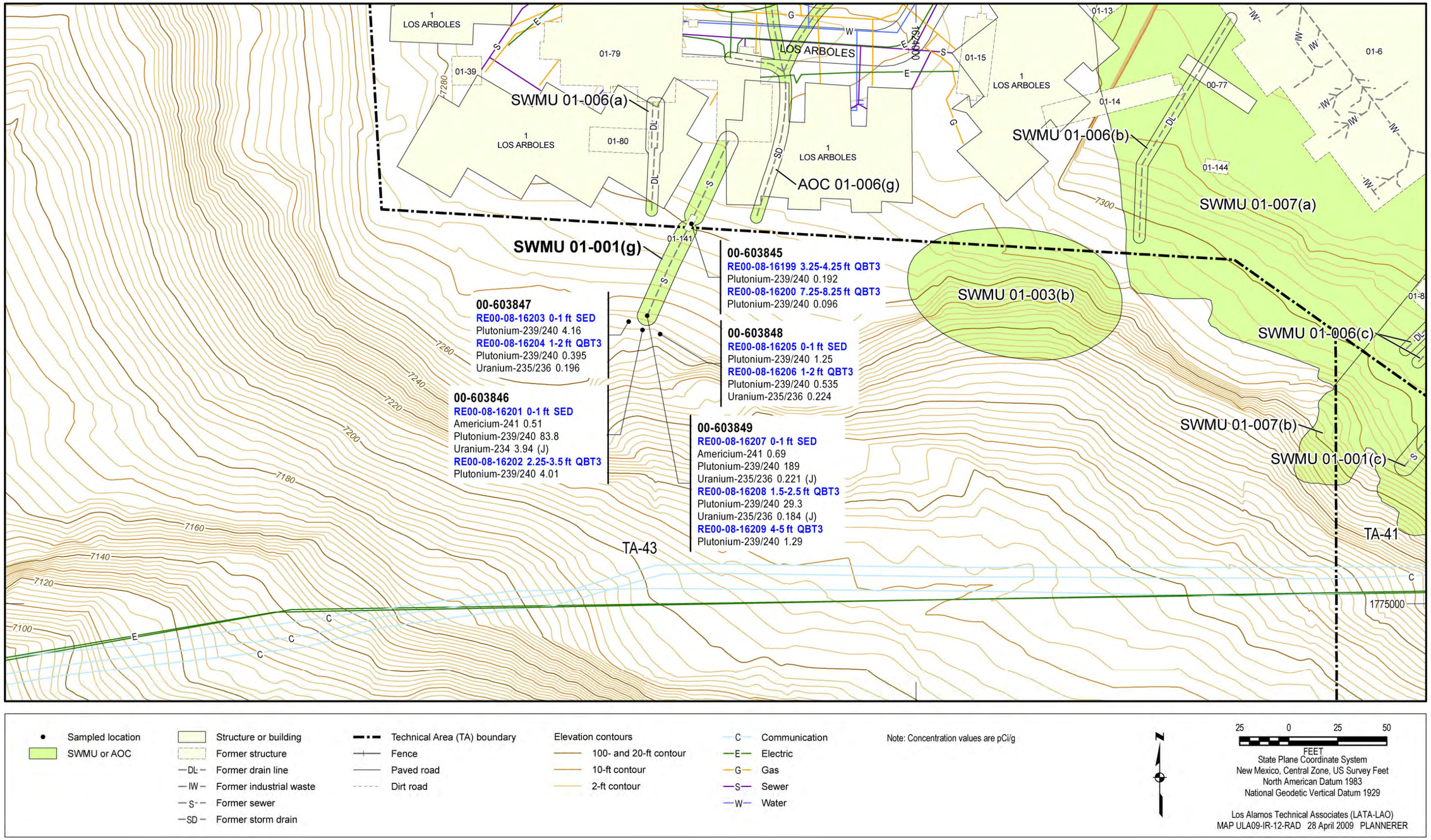


Figure 6.9-4 Radionuclide COPCs detected or detected above BVs/FVs at SWMU 01-001(g)

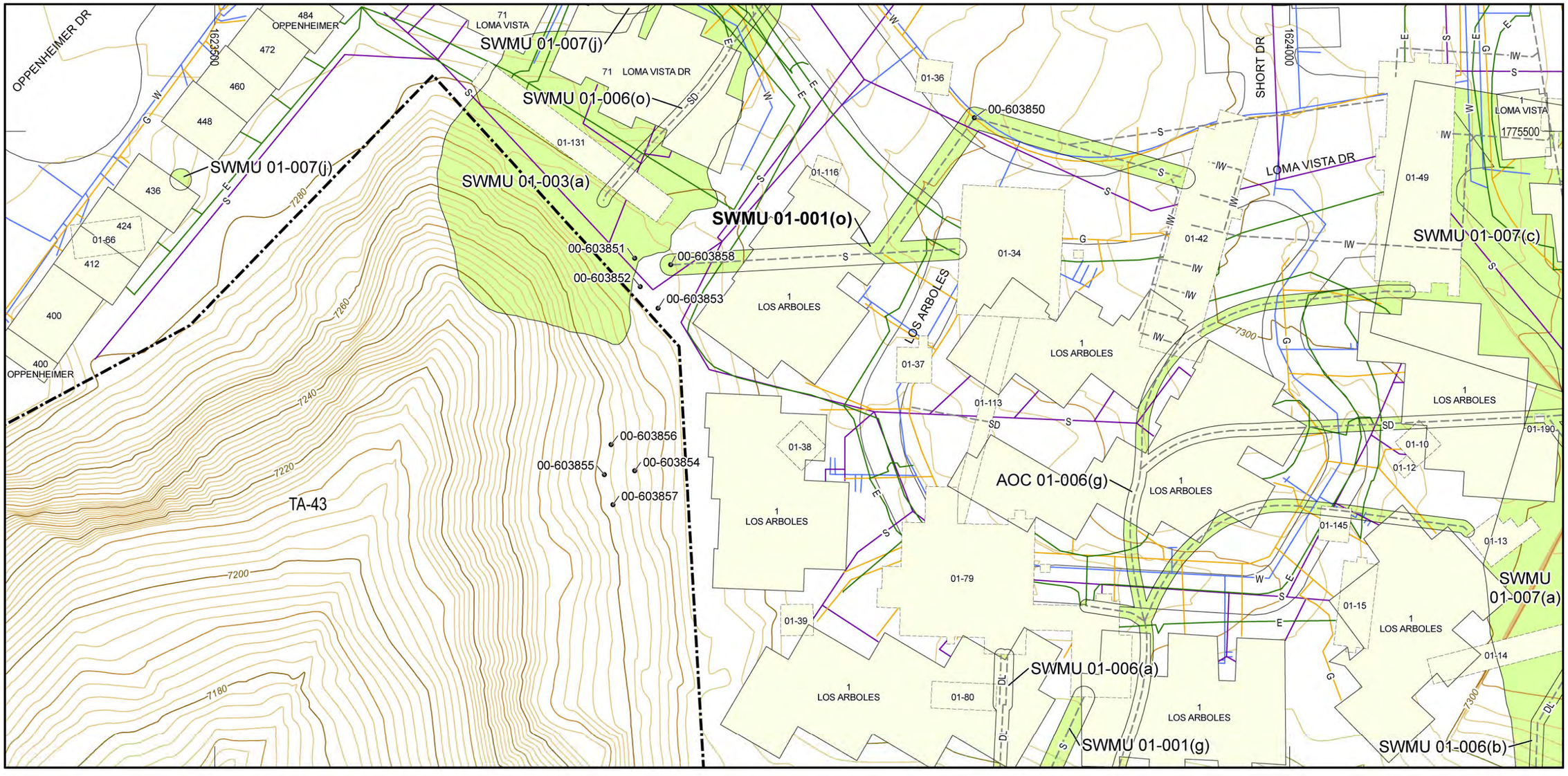


Figure 6.10-1 SWMU 01-001(o) site map and sampling locations

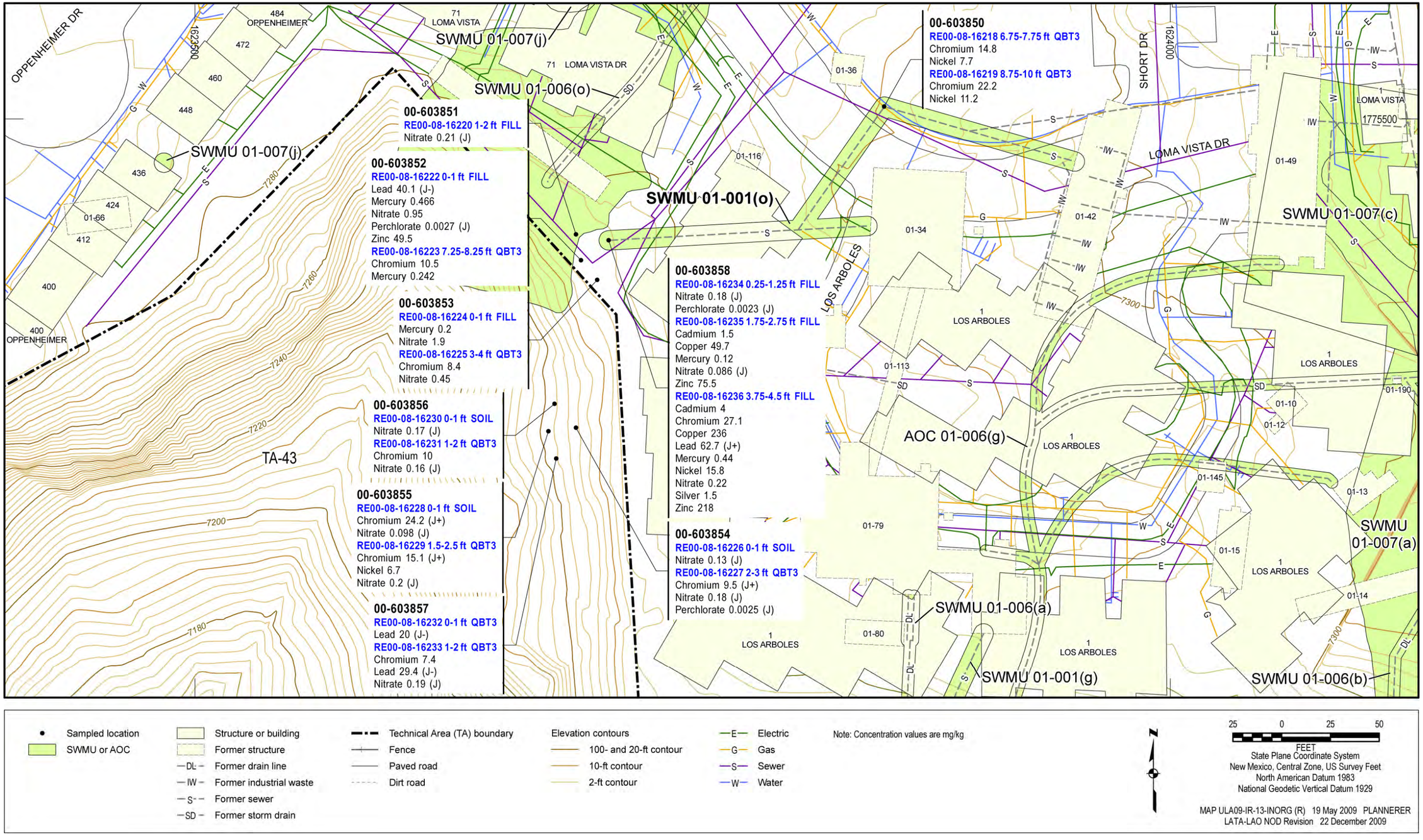
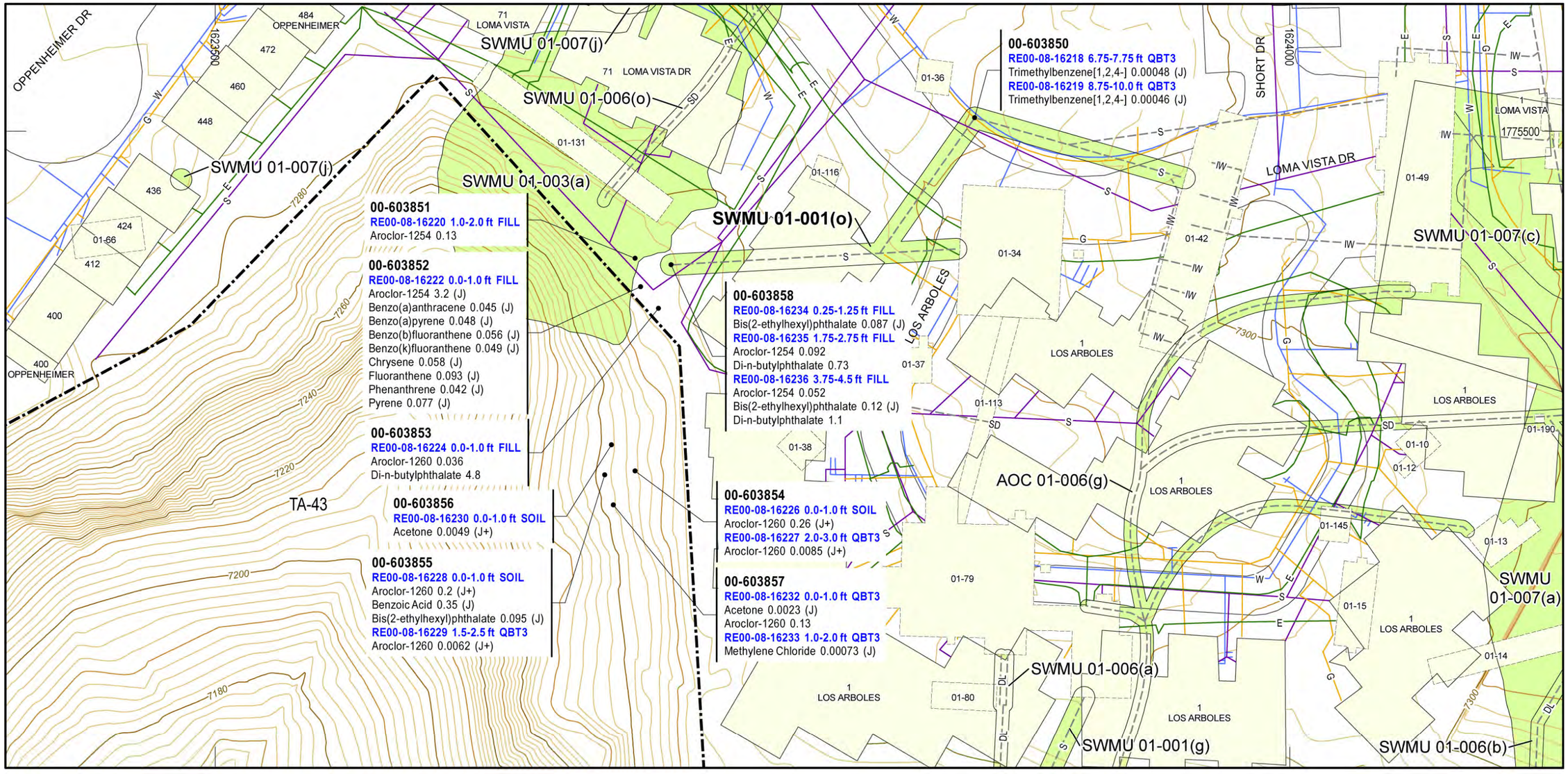


Figure 6.10-2 Inorganic COPCs detected or detected above BVs at SWMU 01-001(o)



Sampled location
SWMU or AOC
Structure or building
Former structure
Former drain line
Former industrial waste
Former sewer
Former storm drain
Technical Area (TA) boundary
Fence
Paved road
Dirt road
Elevation contours
100- and 20-ft contour
10-ft contour
2-ft contour
Electric
Gas
Sewer
Water
Note: Concentration values are mg/kg

25 0 25 50
FEET
State Plane Coordinate System
New Mexico, Central Zone, US Survey Feet
North American Datum 1983
National Geodetic Vertical Datum 1929

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MAP ULA09-IR-13-ORG 28 April 2009 PLANNERER

Figure 6.10-3 Organic COPCs detected at SWMU 01-001(o)

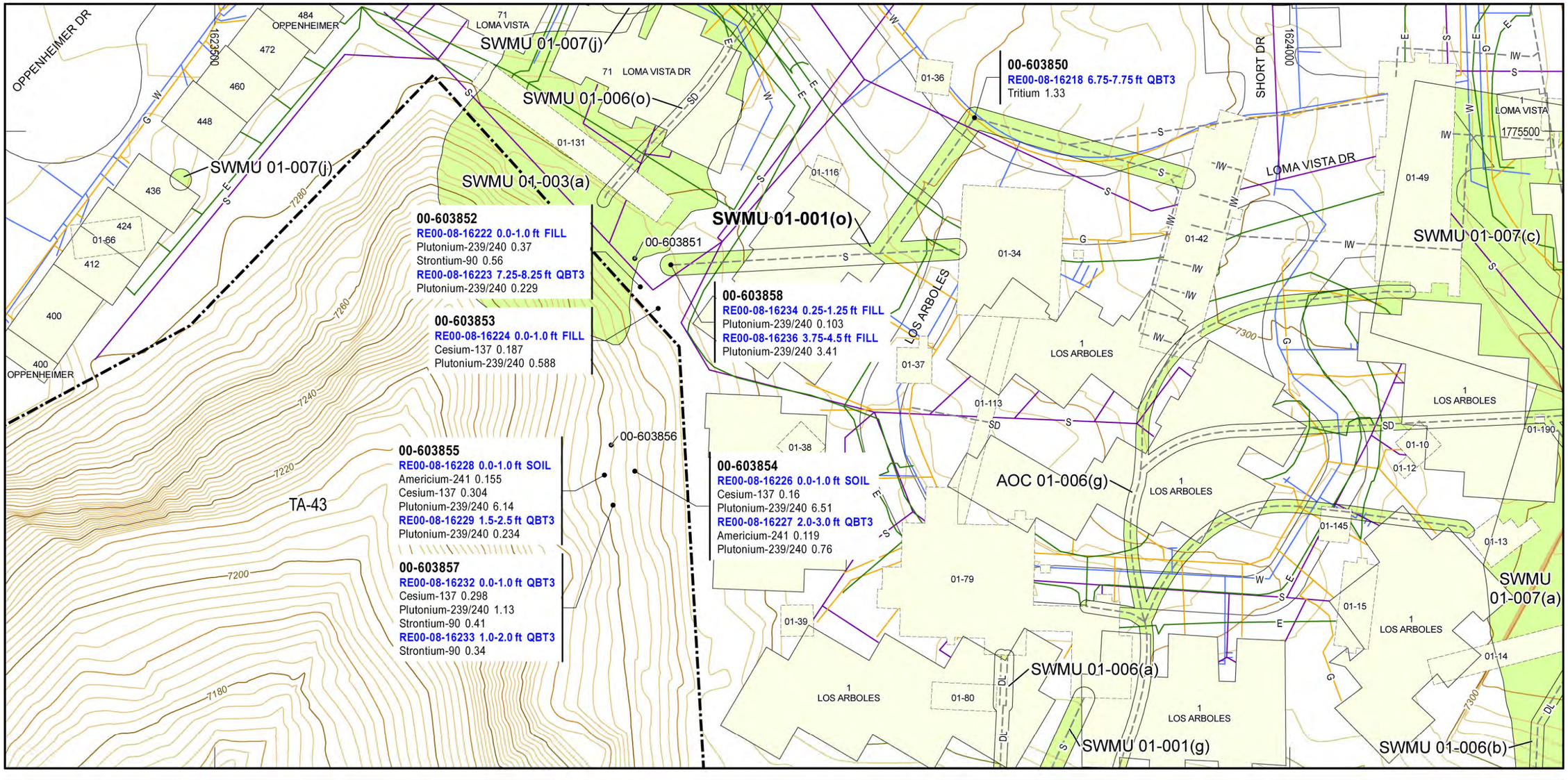


Figure 6.10-4 Radionuclide COPCs detected or detected above BVs/FVs at SWMU 01-001(o)

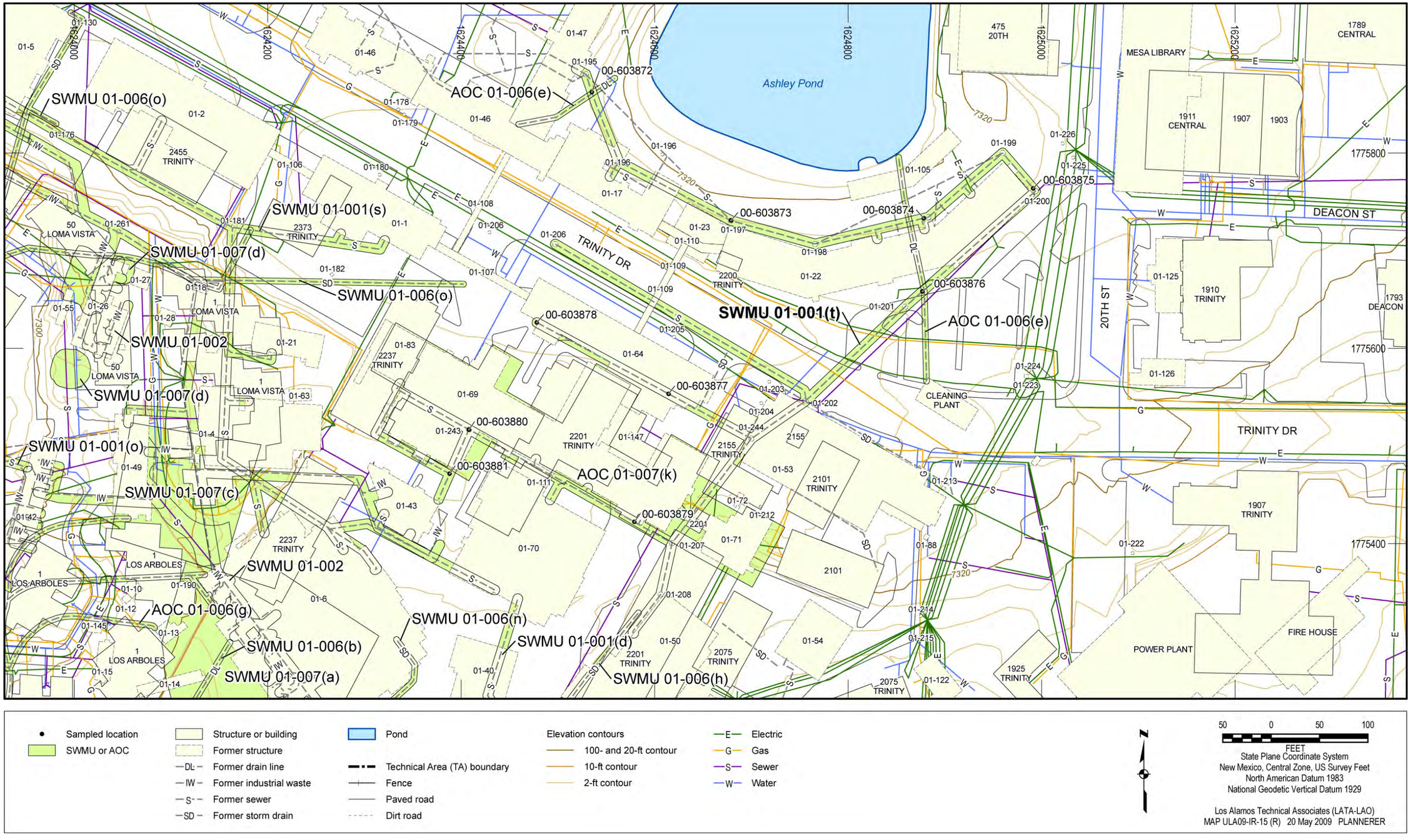


Figure 6.12-1 SWMU 01-001(t) site map and sampling locations

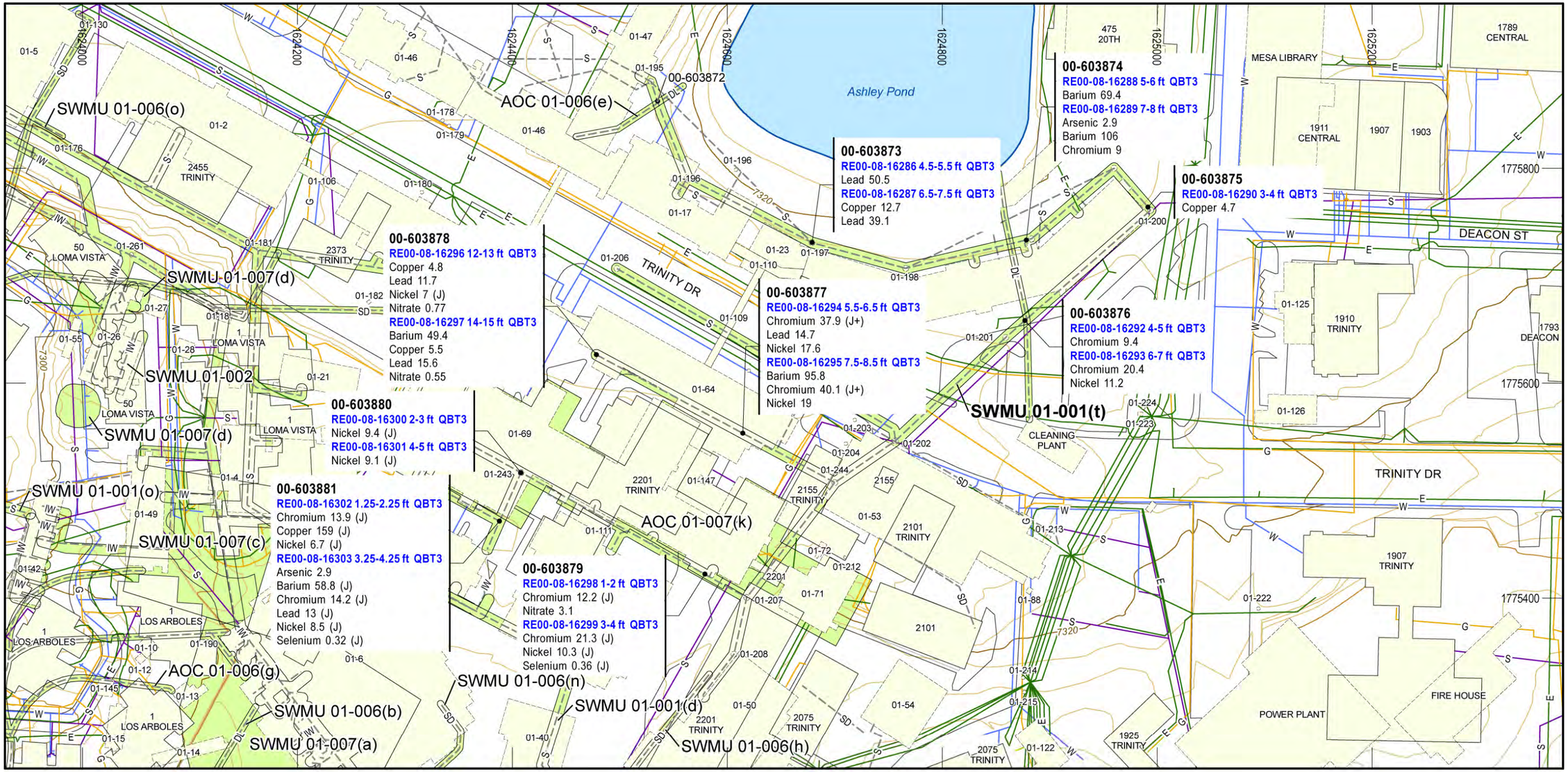


Figure 6.12-2 Inorganic COPCs detected or detected above BVs at SWMU 01-001(t)

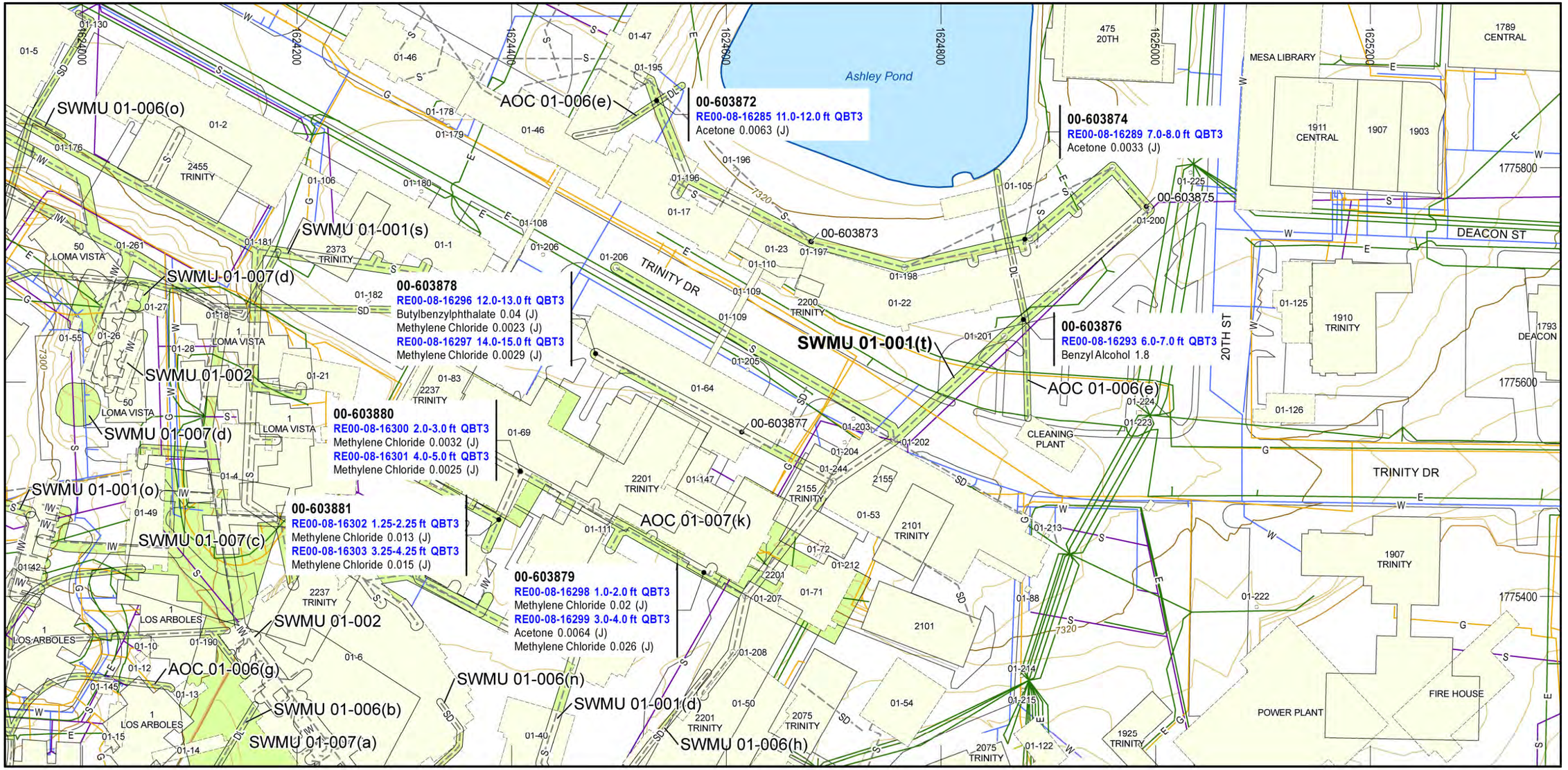


Figure 6.12-3 Organic COPCs detected at SWMU 01-001(t)

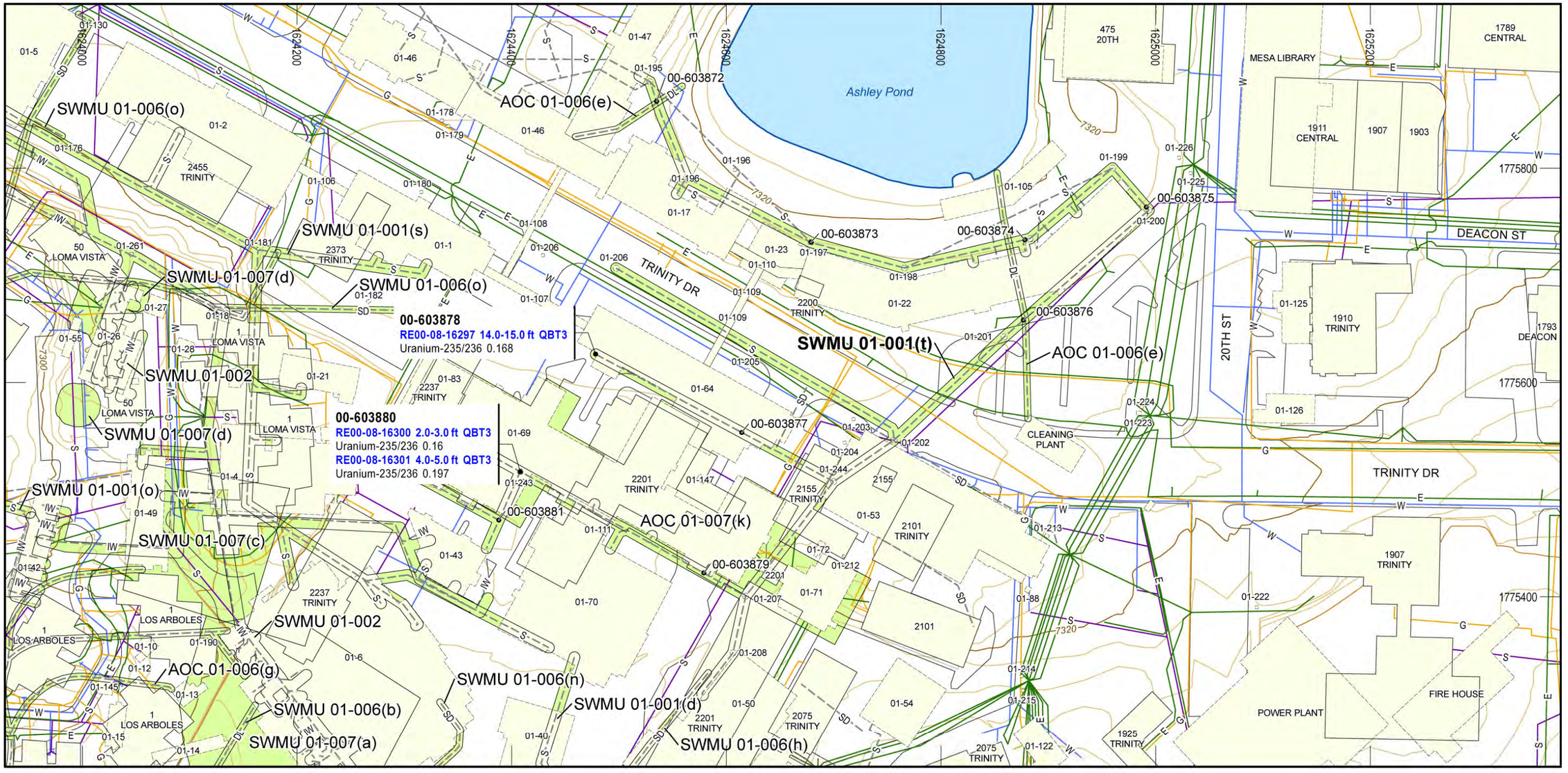


Figure 6.12-4 Radionuclide COPCs detected or detected above BVs/FVs at SWMU 01-001(t)

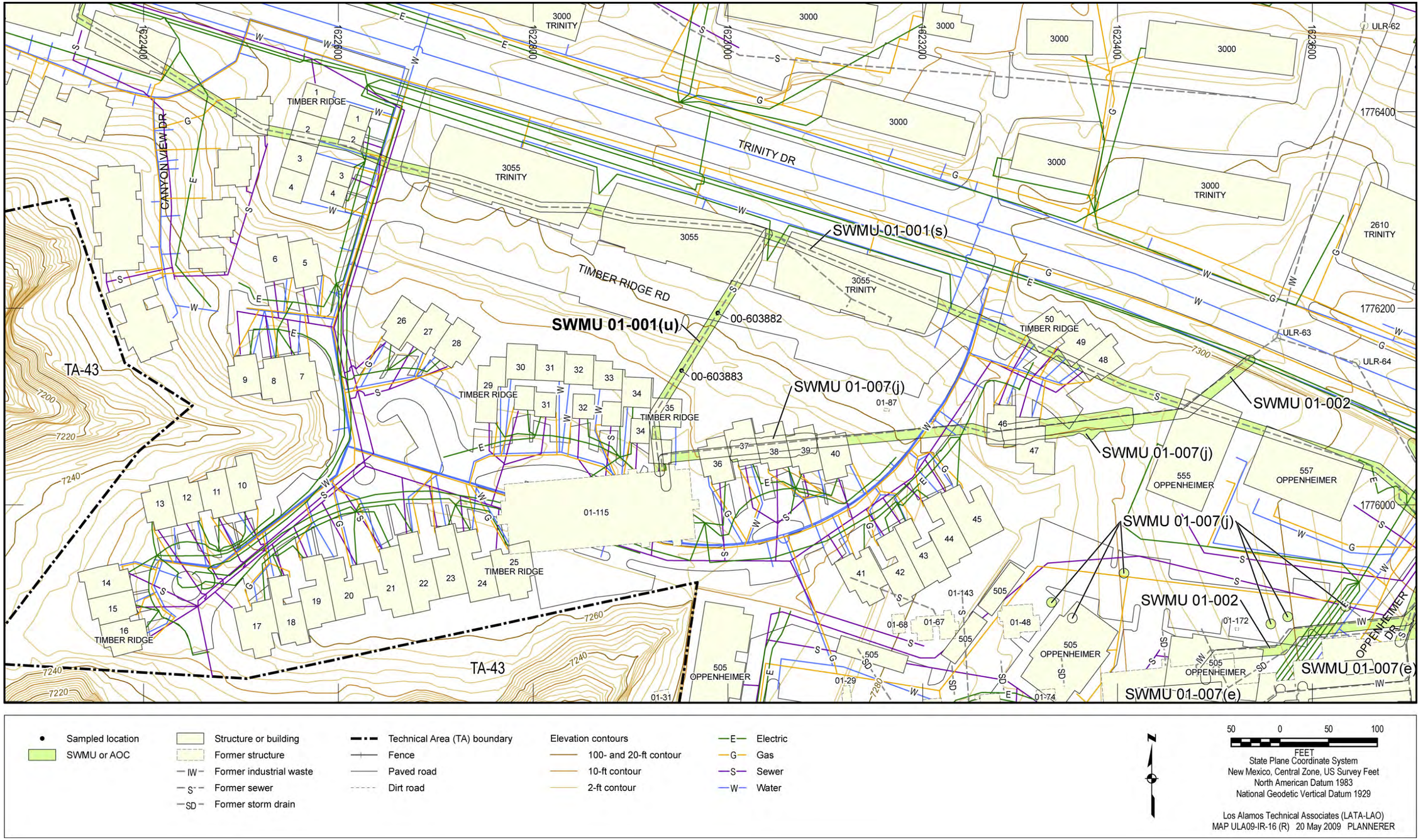


Figure 6.13-1 SWMU 01-001(u) site map and sampling locations

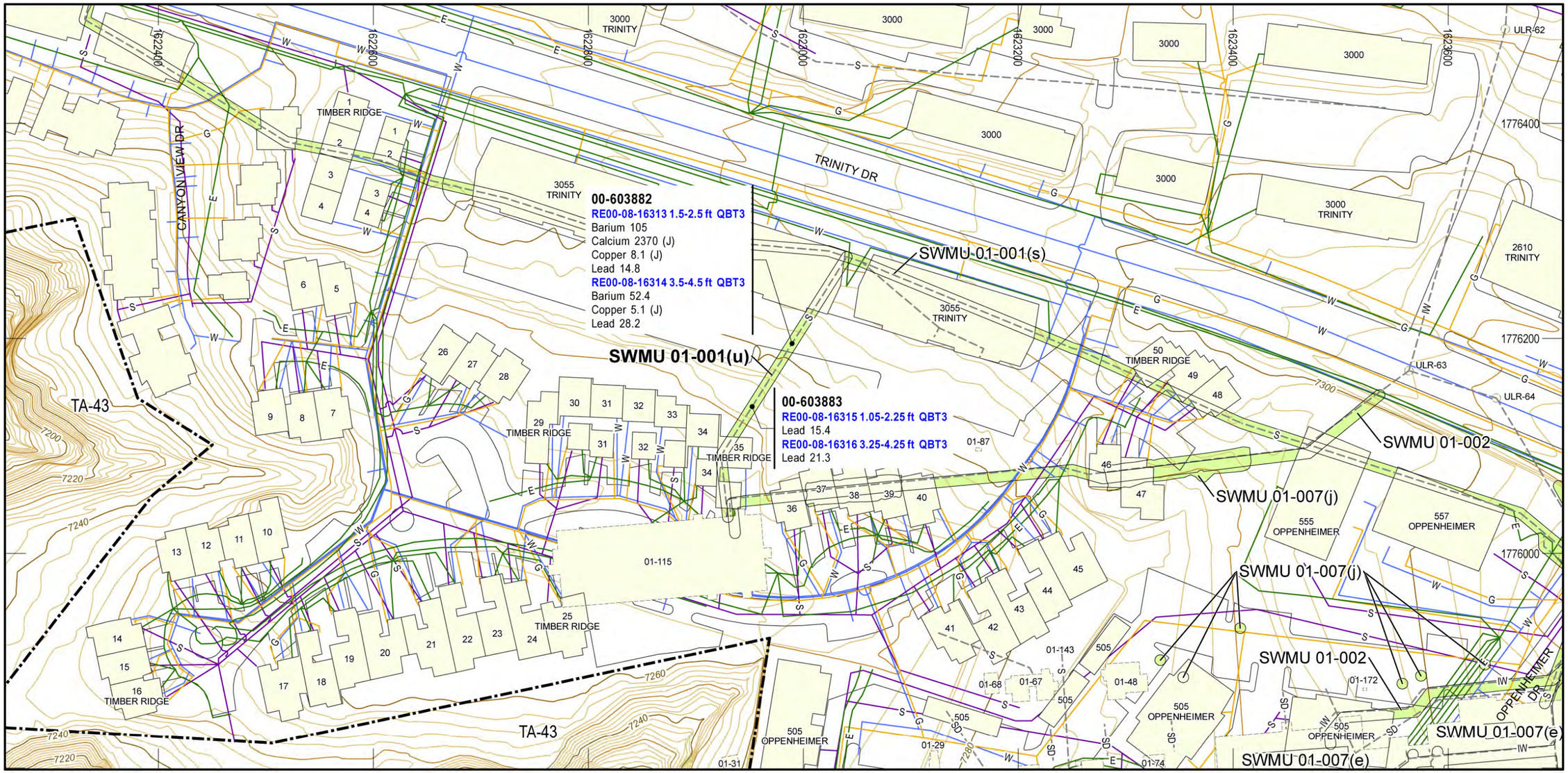


Figure 6.13-2 Inorganic COPCs detected or detected above BVs at SWMU 01-001(u)

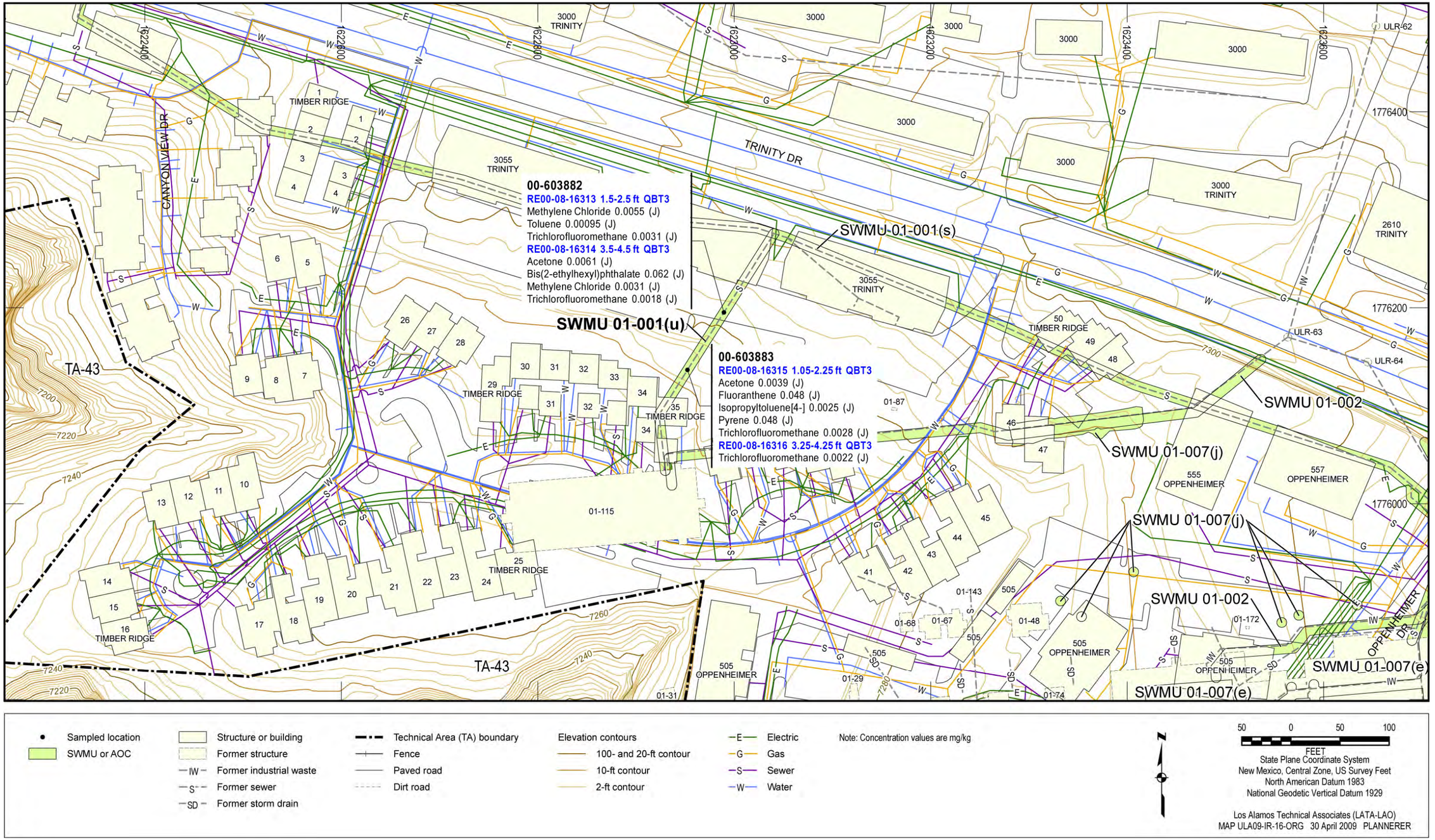


Figure 6.13-3 Organic COPCs detected at SWMU 01-001(u)

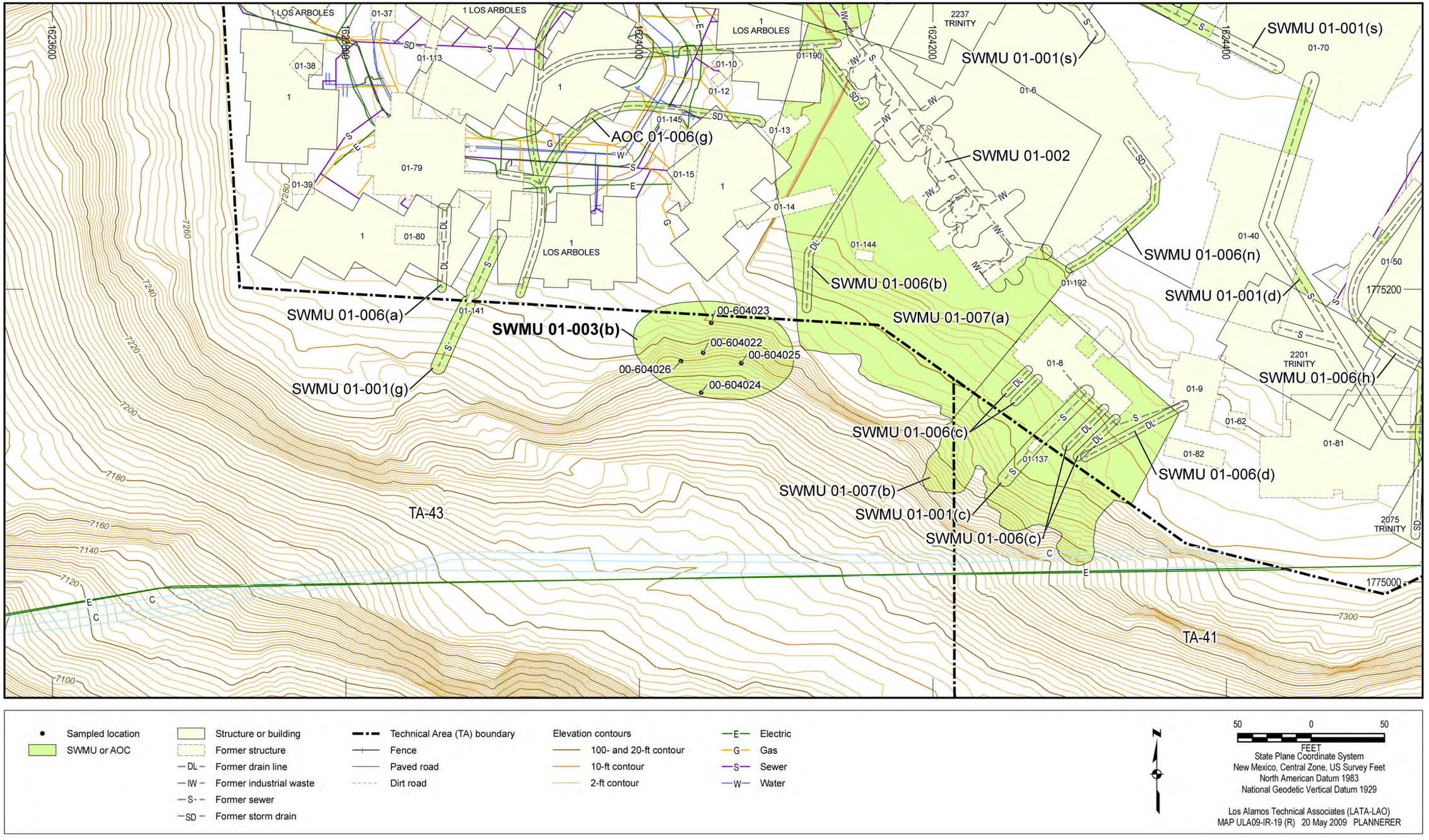


Figure 6.16-1 SWMU 01-003(b) site map and sampling locations

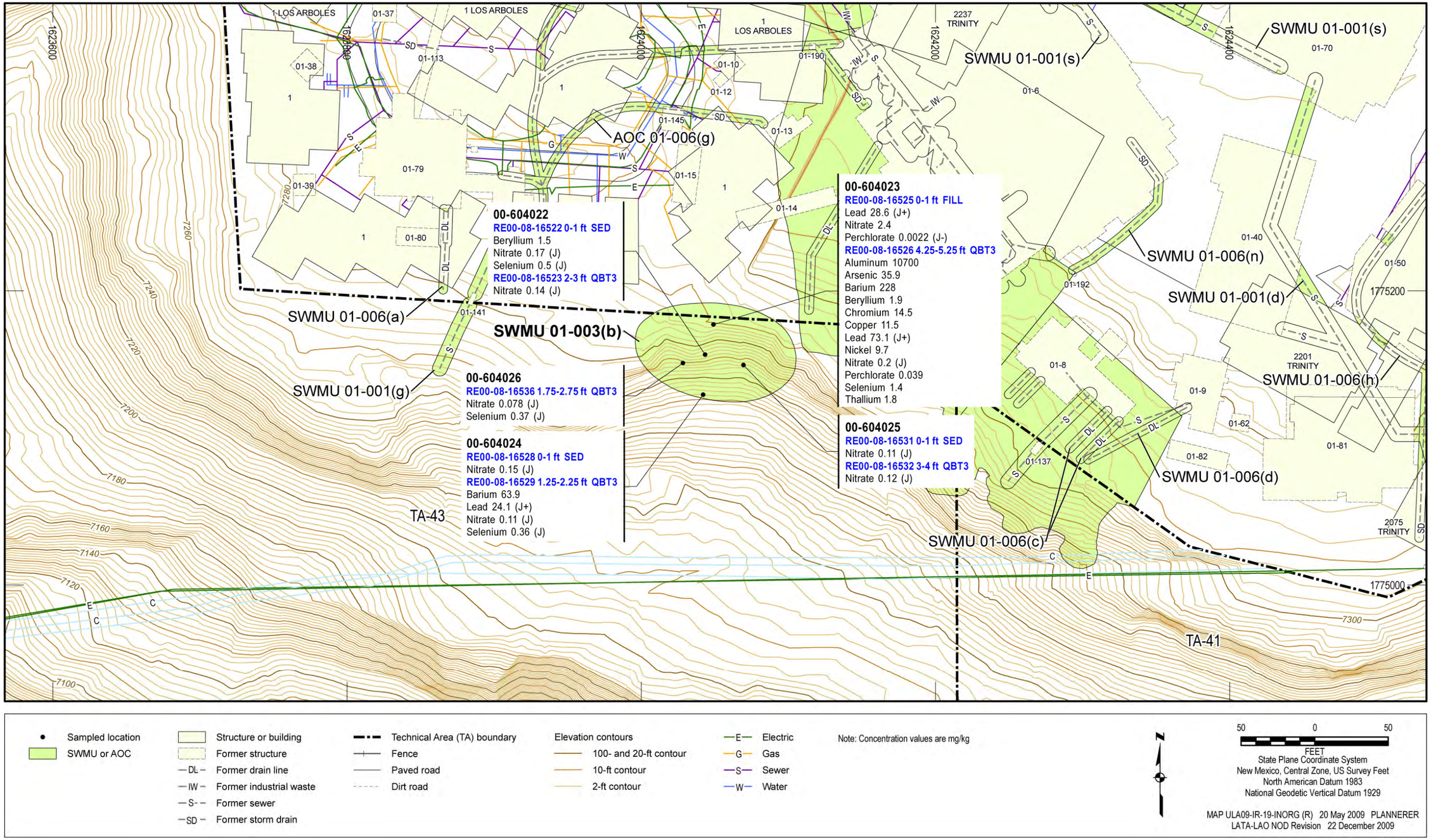


Figure 6.16-2 Inorganic COPCs detected or detected above BVs at SWMU 01-003(b)

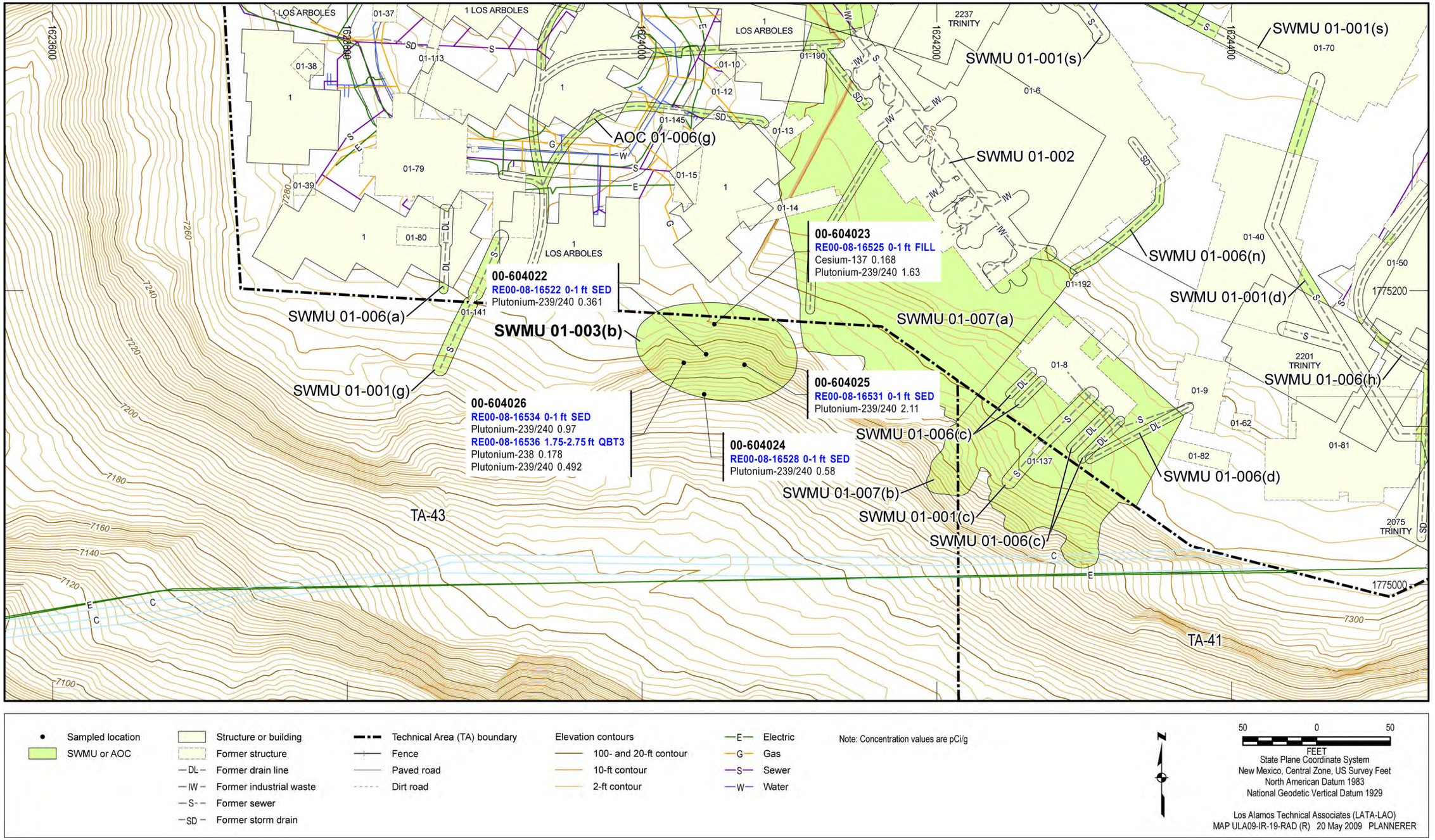


Figure 6.16-3 Radionuclide COPCs detected or detected above BVs/FVs at SWMU 01-003(b)

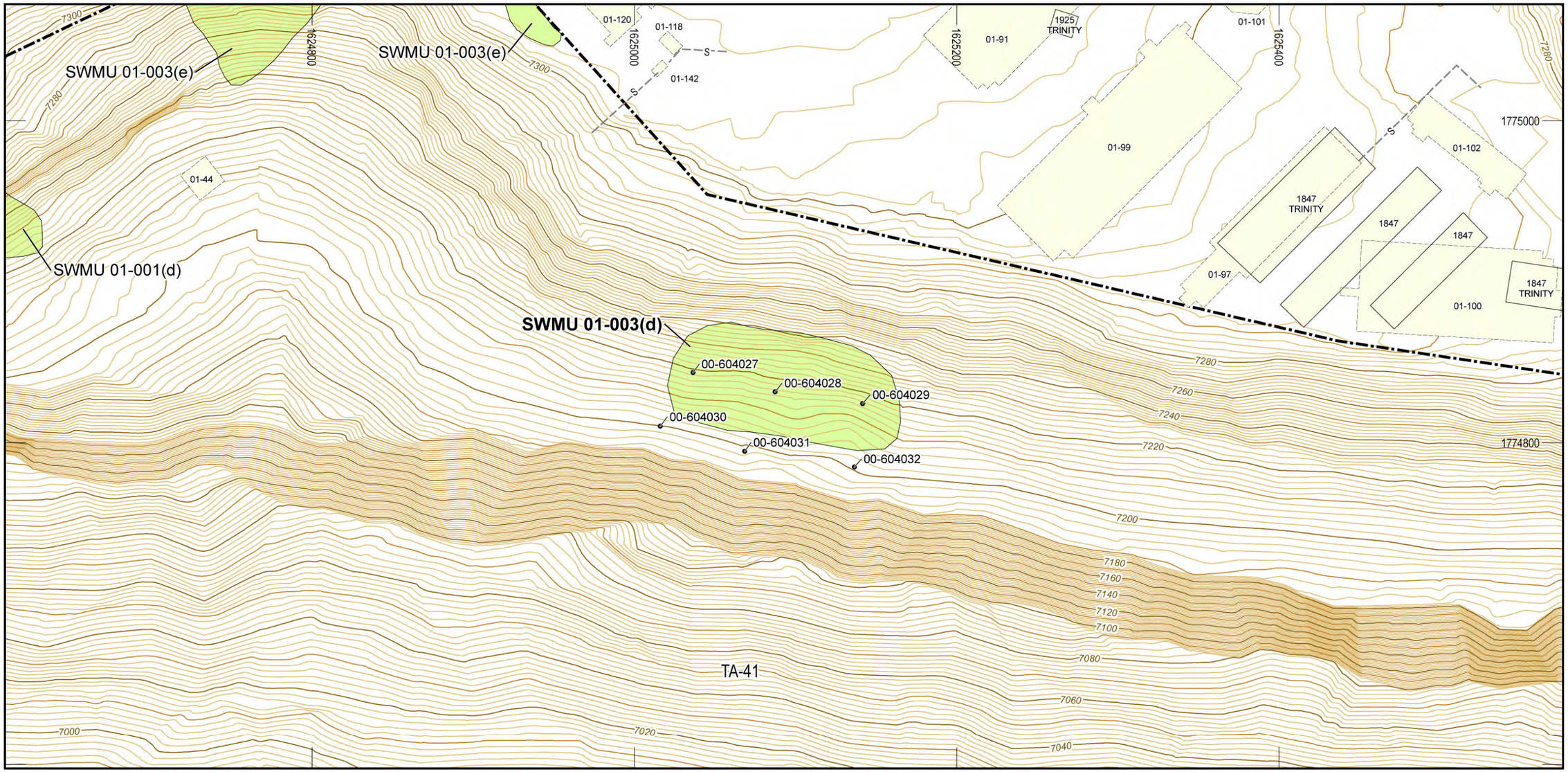


Figure 6.17-1 SWMU 01-003(d) site map and sampling locations

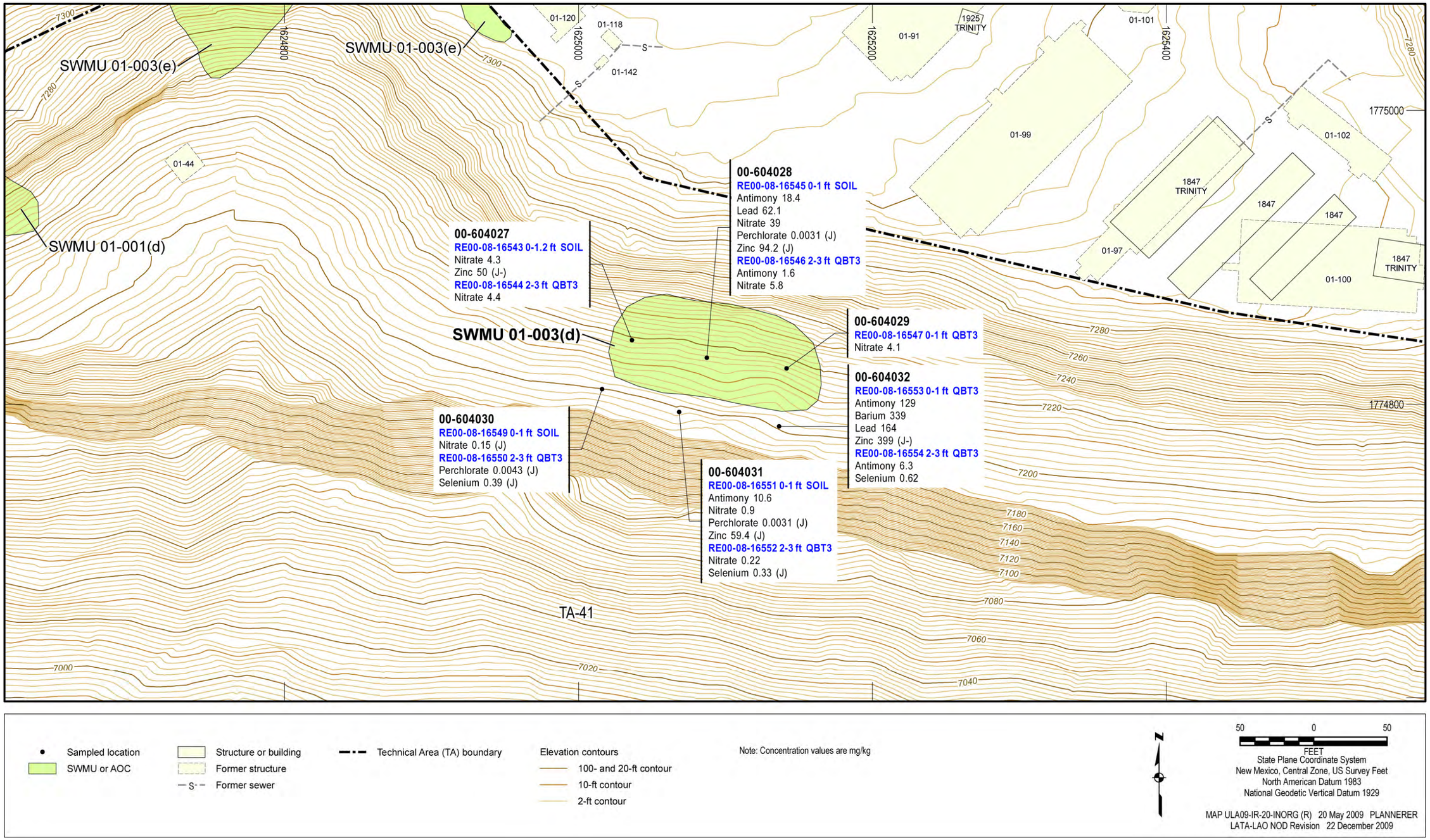


Figure 6.17-2 Inorganic COPCs detected or detected above BVs at SWMU 01-003(d)

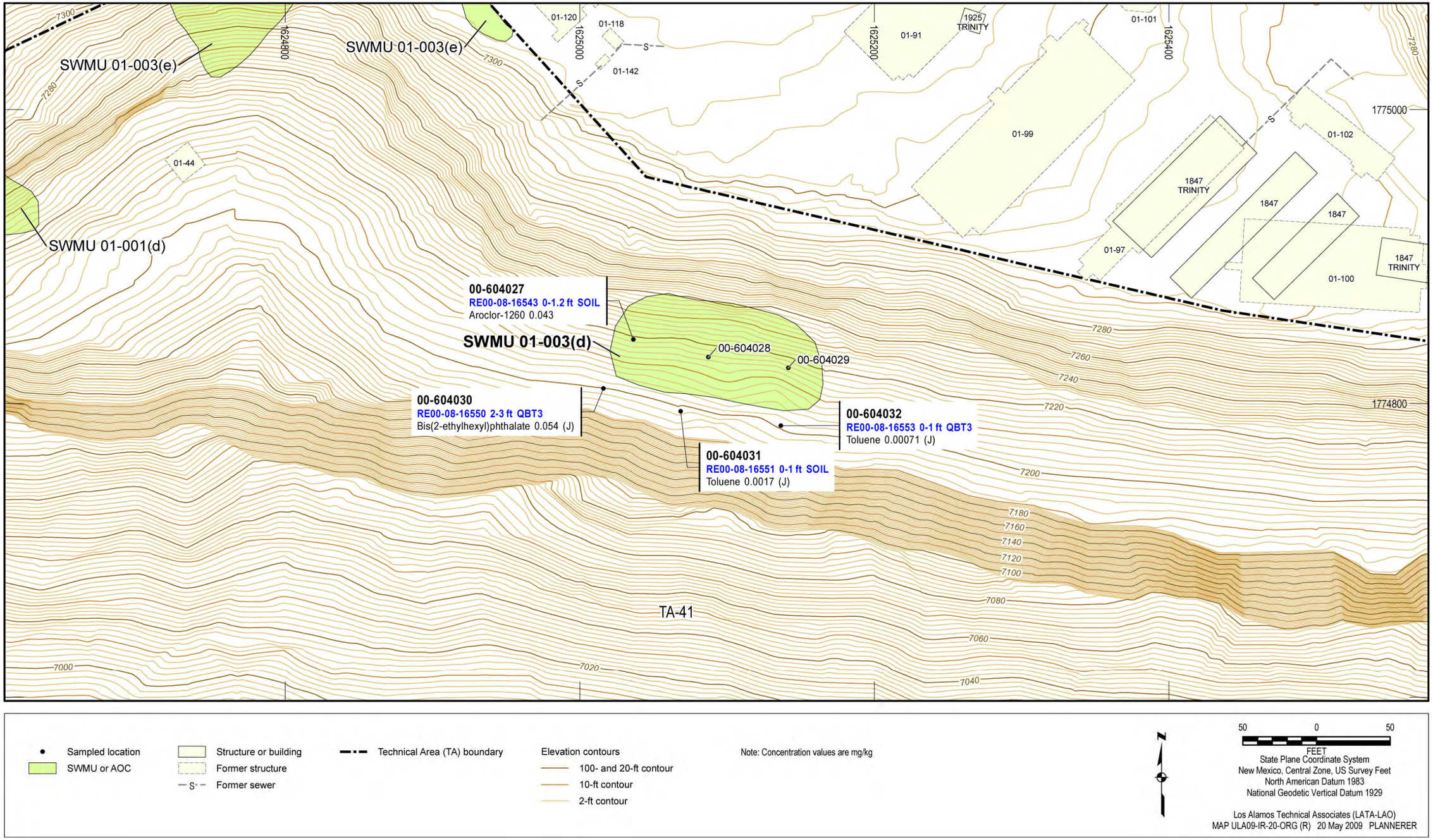


Figure 6.17-3 Organic COPCs detected at SWMU 01-003(d)

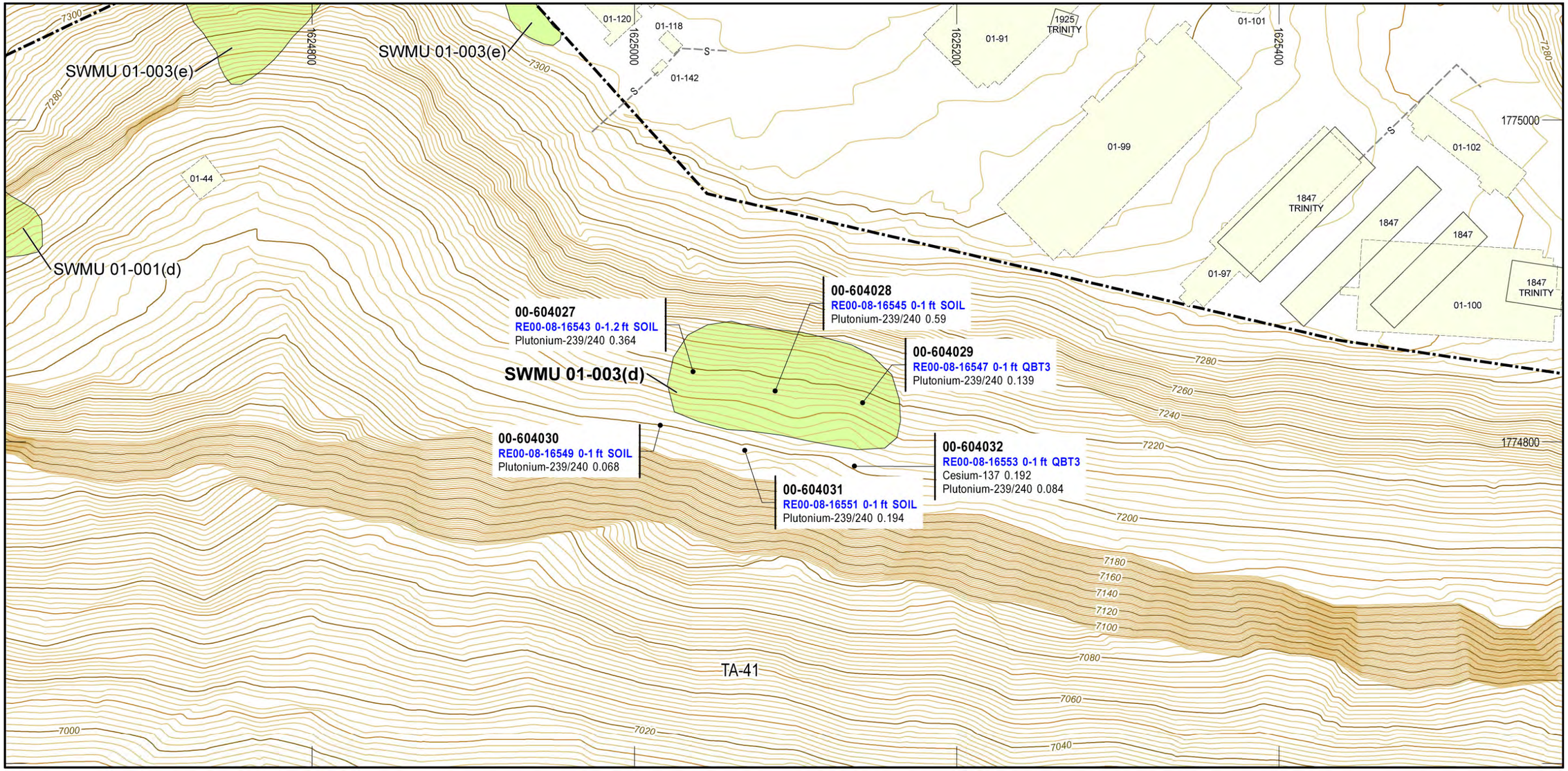
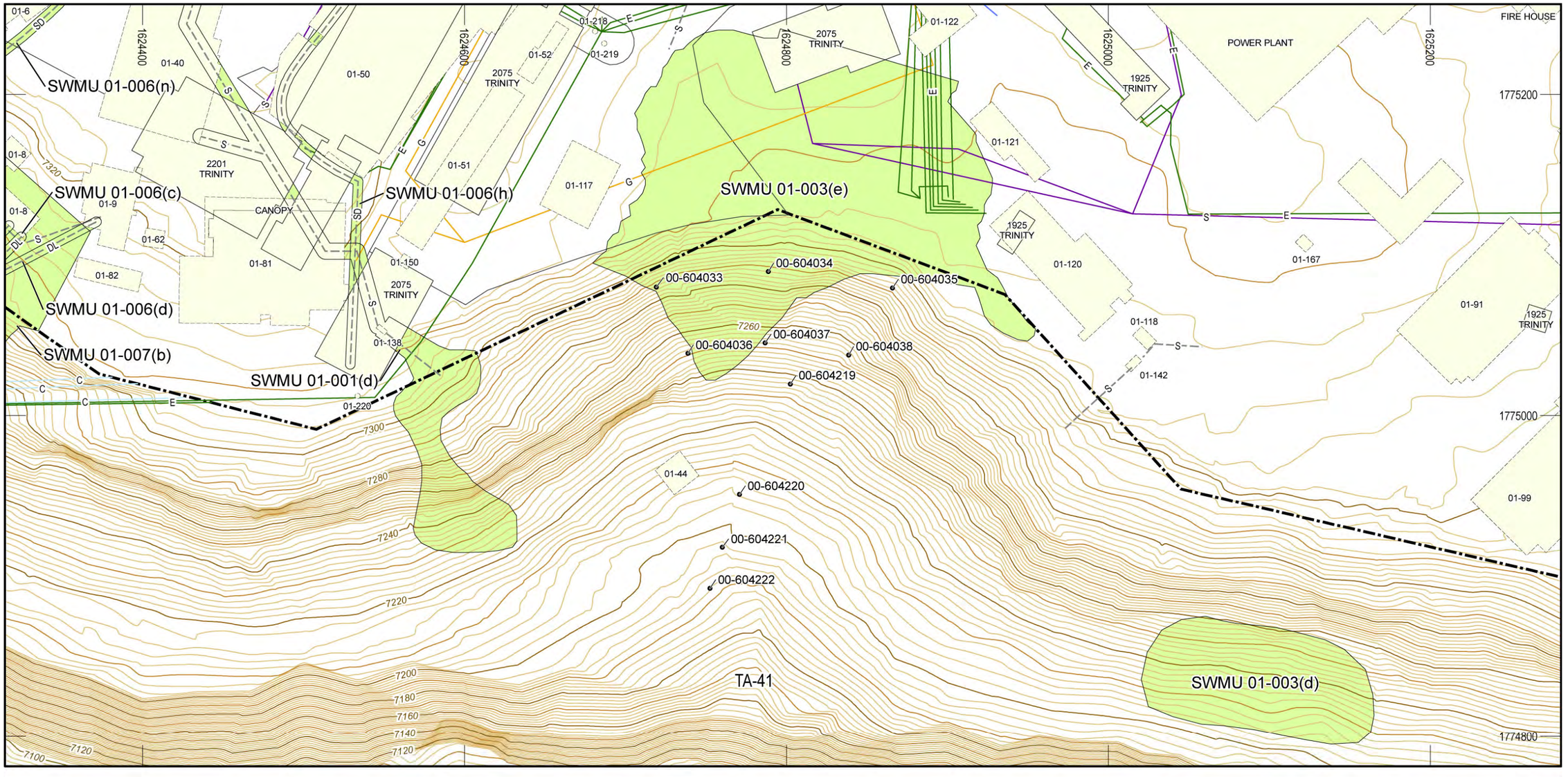


Figure 6.17-4 Radionuclide COPCs detected or detected above BVs/FVs at SWMU 01-003(d)



Sampled location
SWMU or AOC
Structure or building
Former structure
Former drain line
Former sewer
Former storm drain
Technical Area (TA) boundary
Paved road
Elevation contours
100- and 20-ft contour
10-ft contour
2-ft contour
Communication
Electric
Gas
Sewer
Water

50 0 50
FEET
State Plane Coordinate System
New Mexico, Central Zone, US Survey Feet
North American Datum 1983
National Geodetic Vertical Datum 1929

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MAP ULA09-IR-21 (R) 20 May 2009 PLANNERER

Figure 6.18-1 SWMU 01-003(e) site map and sampling locations

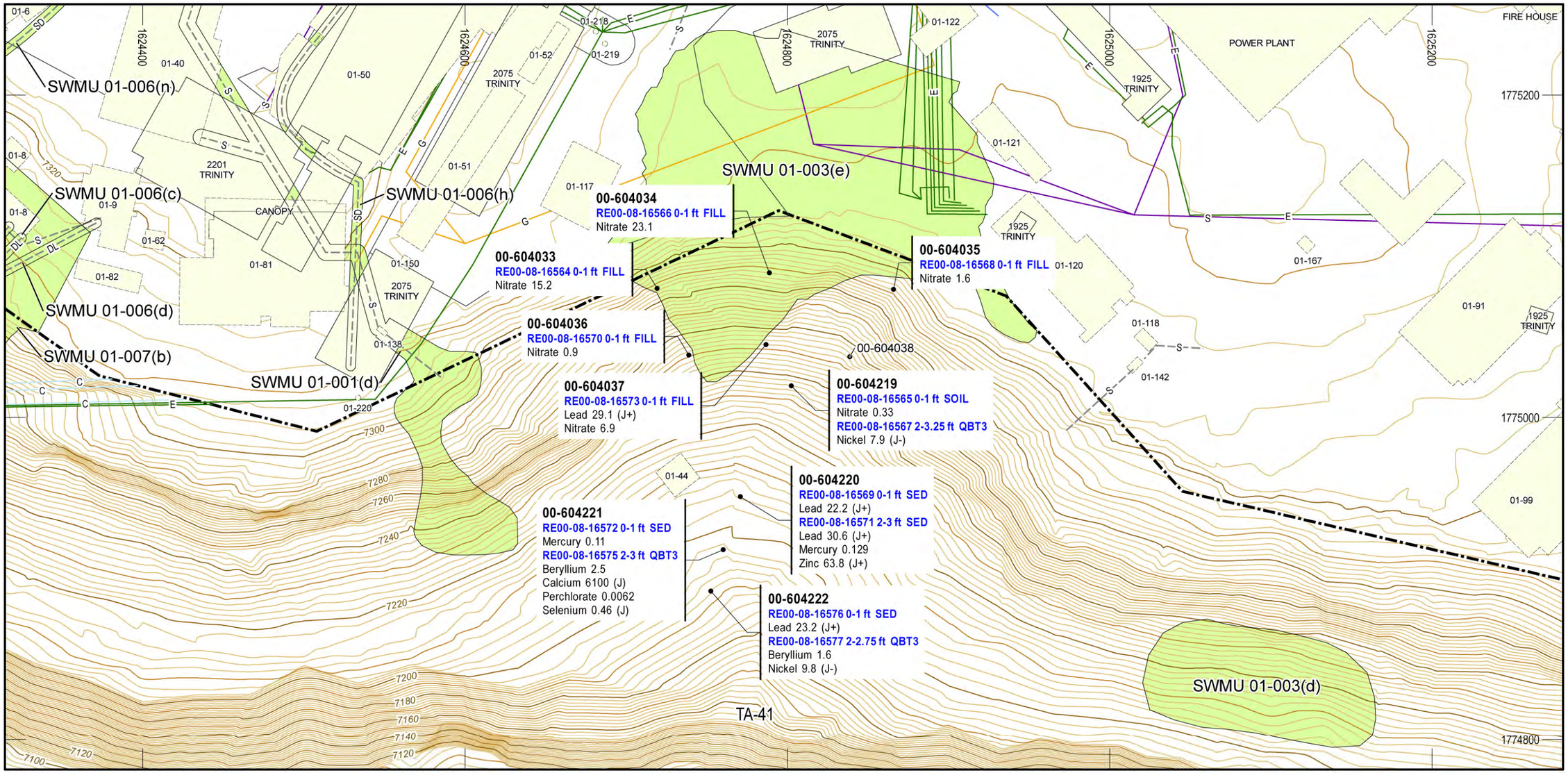


Figure 6.18-2 Inorganic COPCs detected or detected above BVs at SWMU 01-003(e)

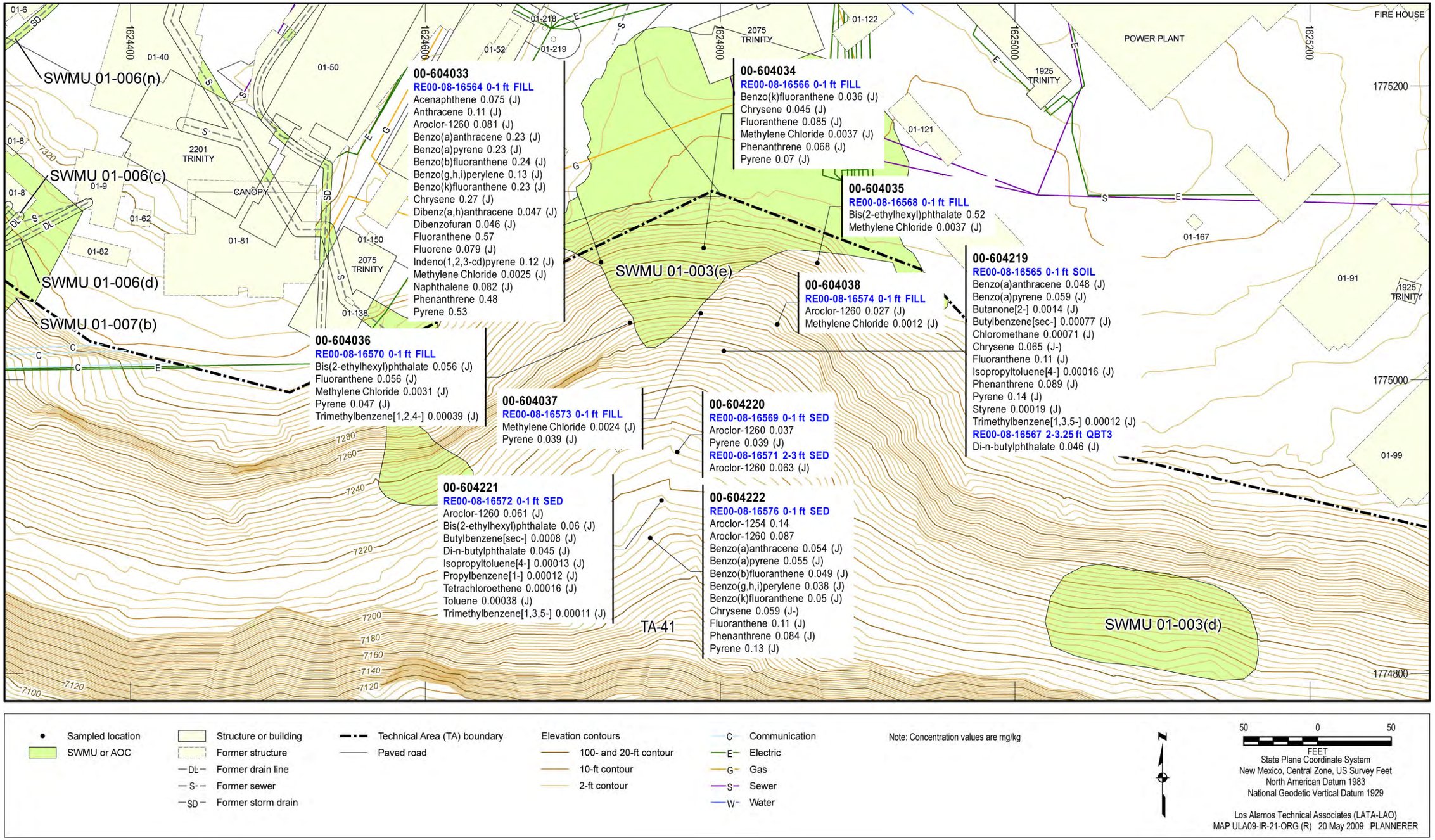


Figure 6.18-3 Organic COPCs detected at SWMU 01-003(e)

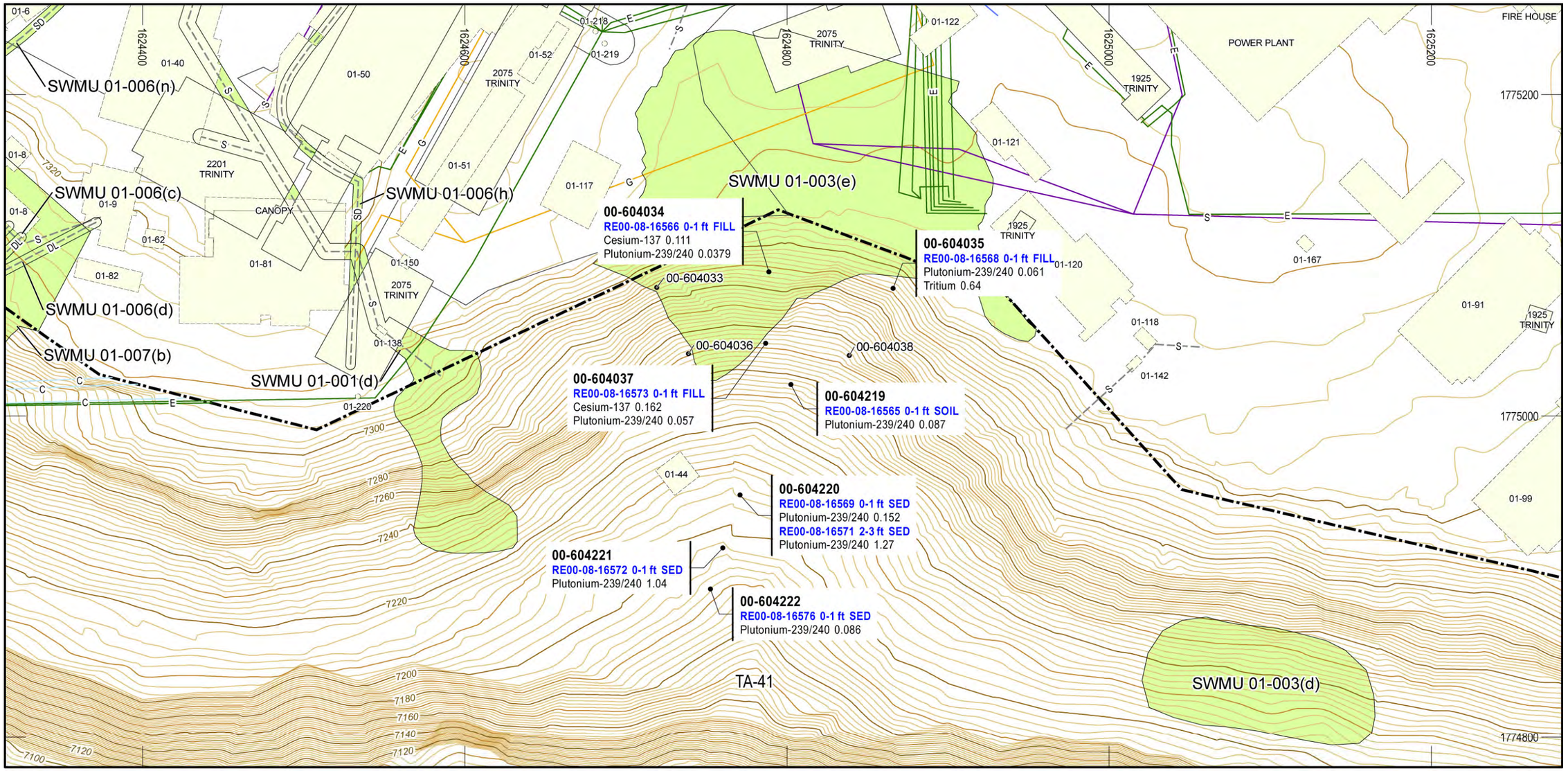


Figure 6.18-4 Radionuclide COPCs detected or detected above BVs/FVs at SWMU 01-003(e)

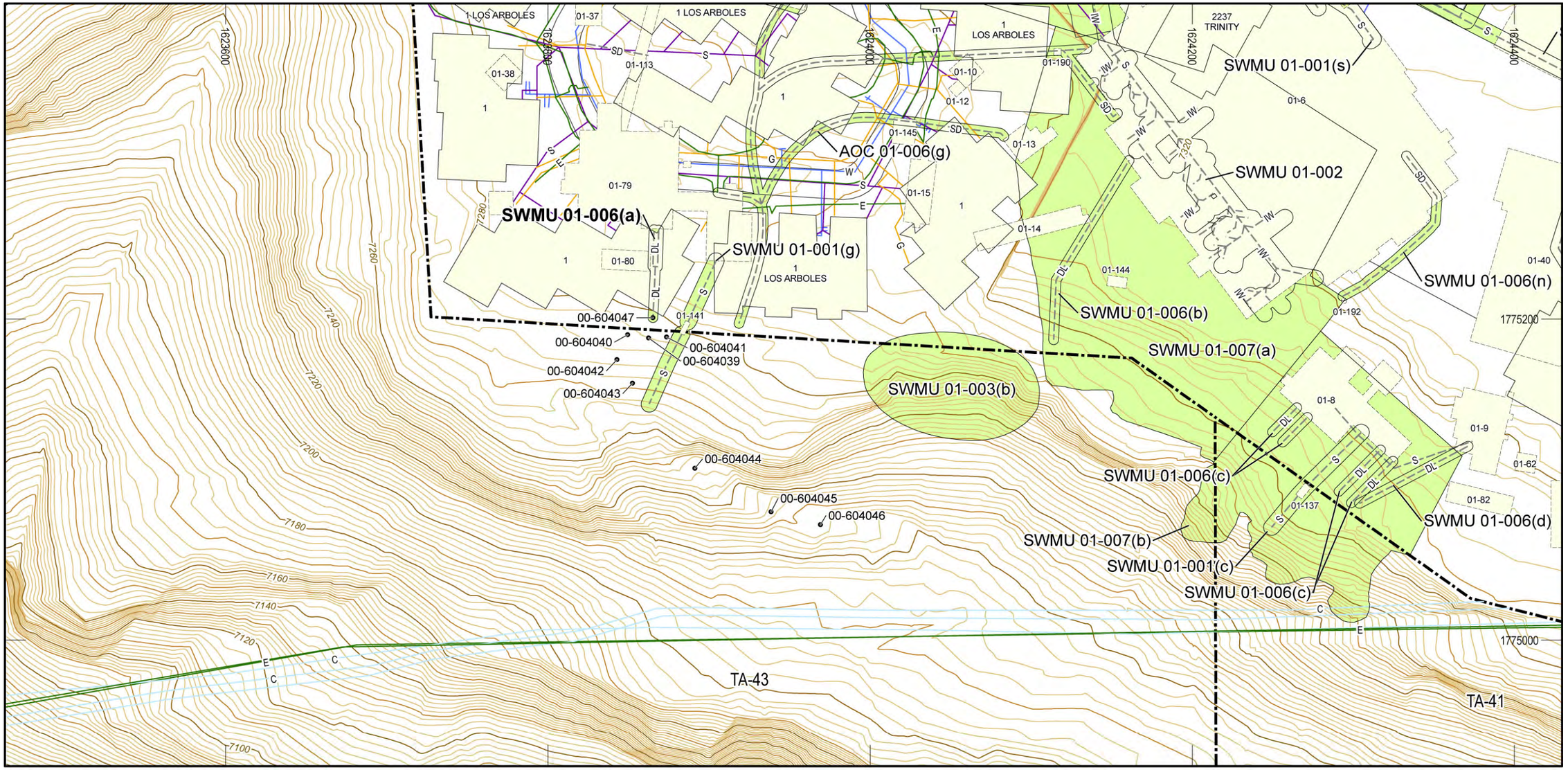


Figure 6.19-1 SWMU 01-006(a) site map and sampling locations

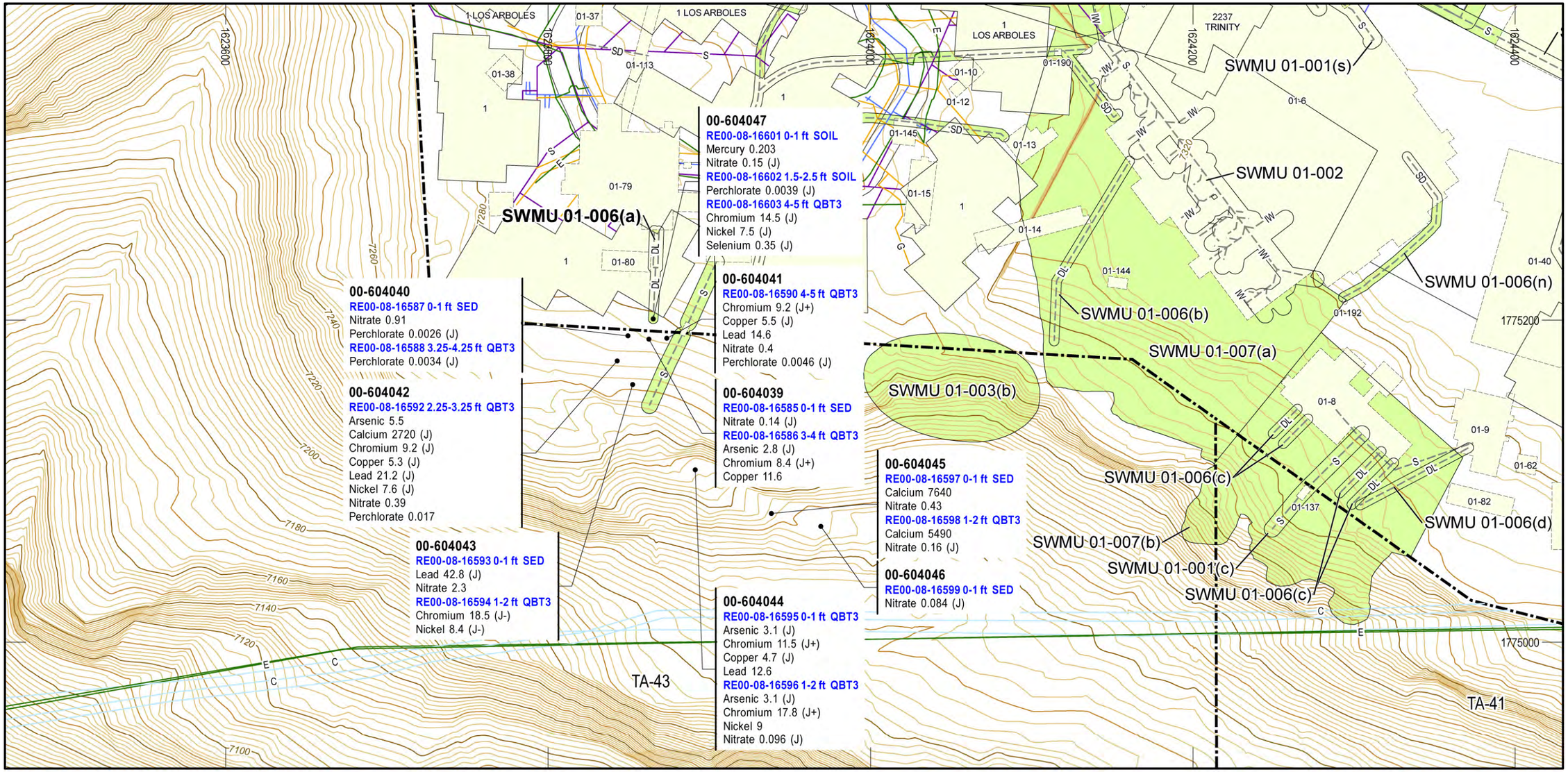


Figure 6.19-2 Inorganic COPCs detected or detected above BVs at SWMU 01-006(a)

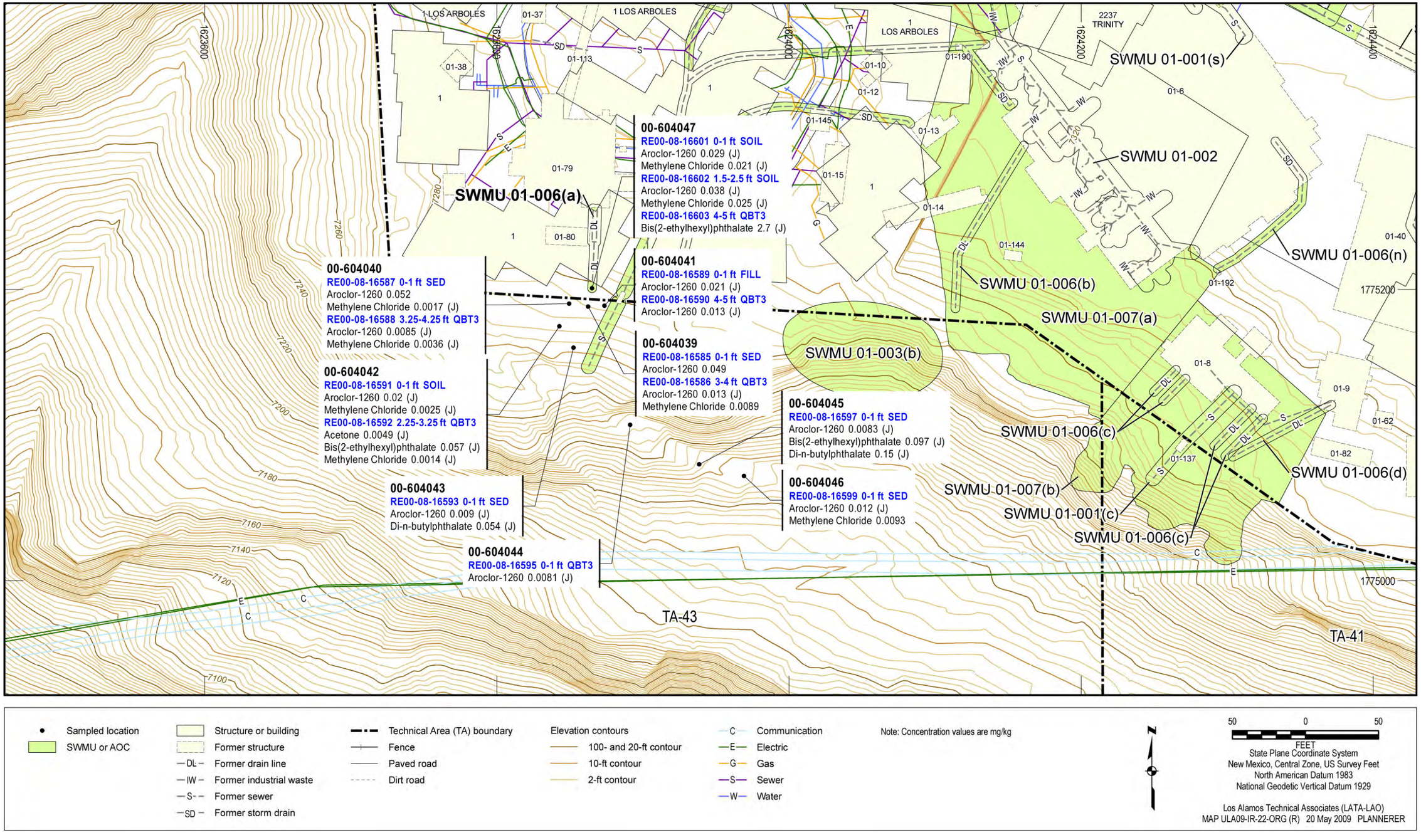


Figure 6.19-3 Organic COPCs detected at SWMU 01-006(a)

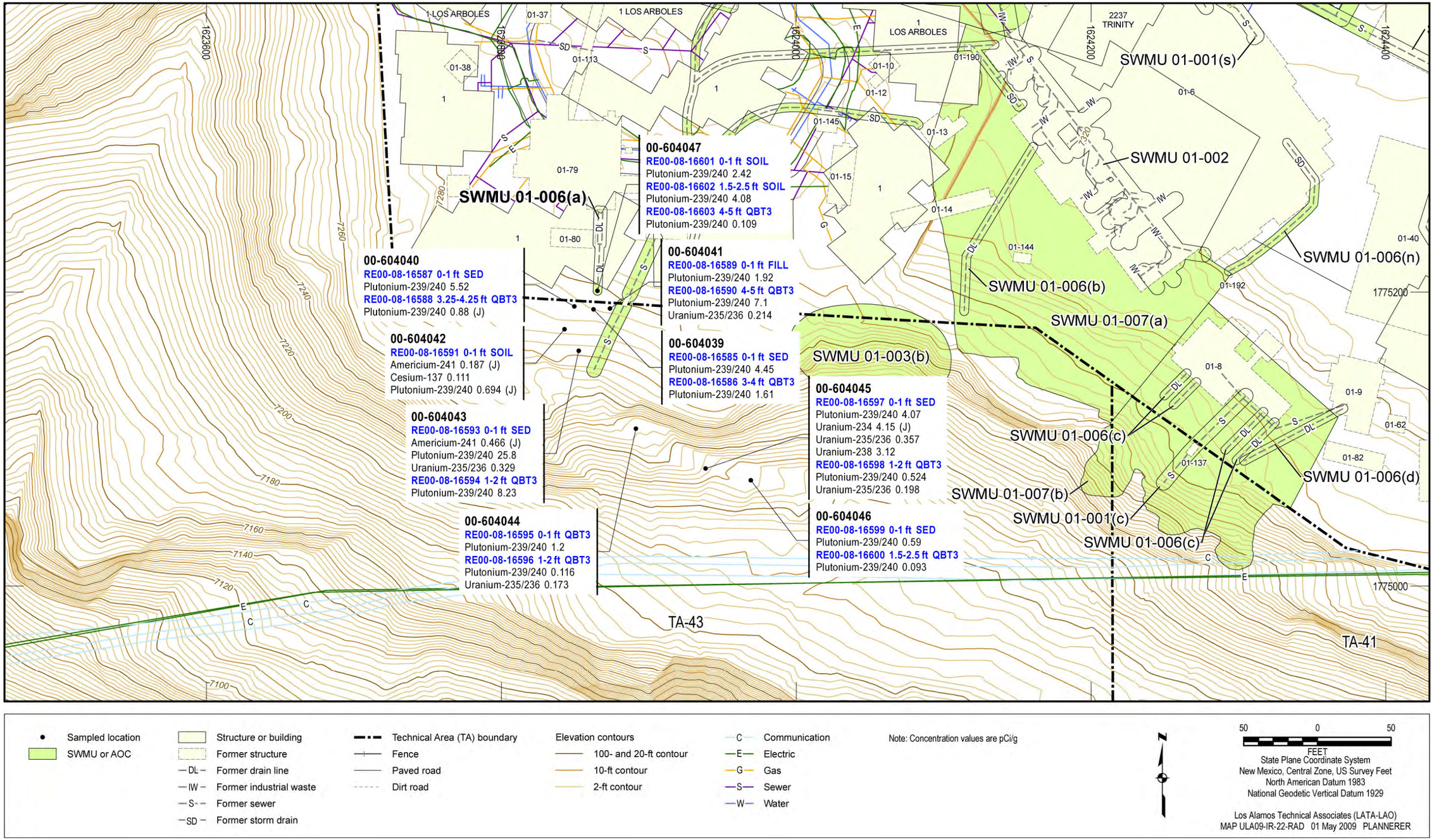


Figure 6.19-4 Radionuclide COPCs detected or detected above BVs/FVs at SWMU 01-006(a)

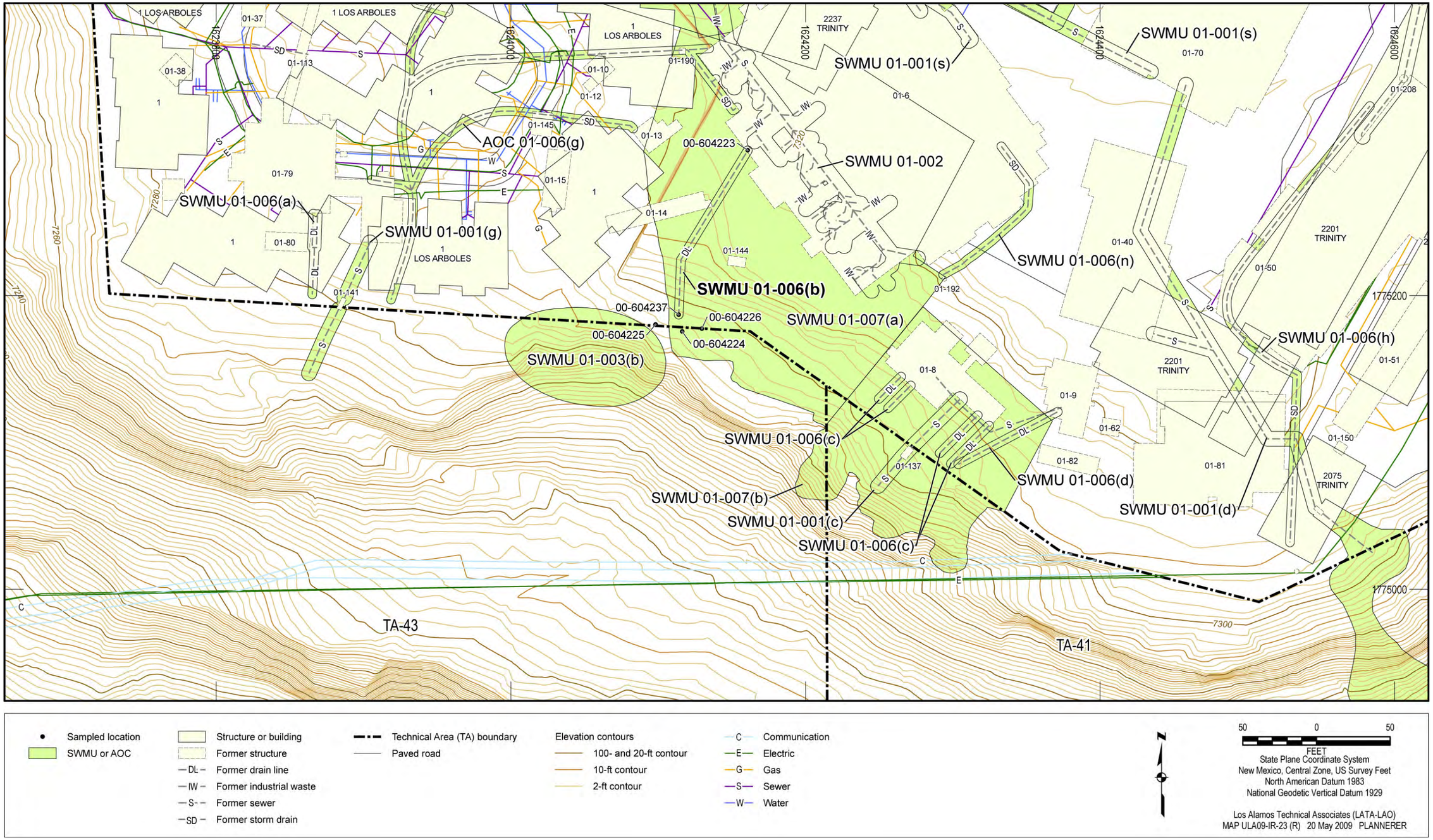


Figure 6.20-1 SWMU 01-006(b) site map and sampling locations

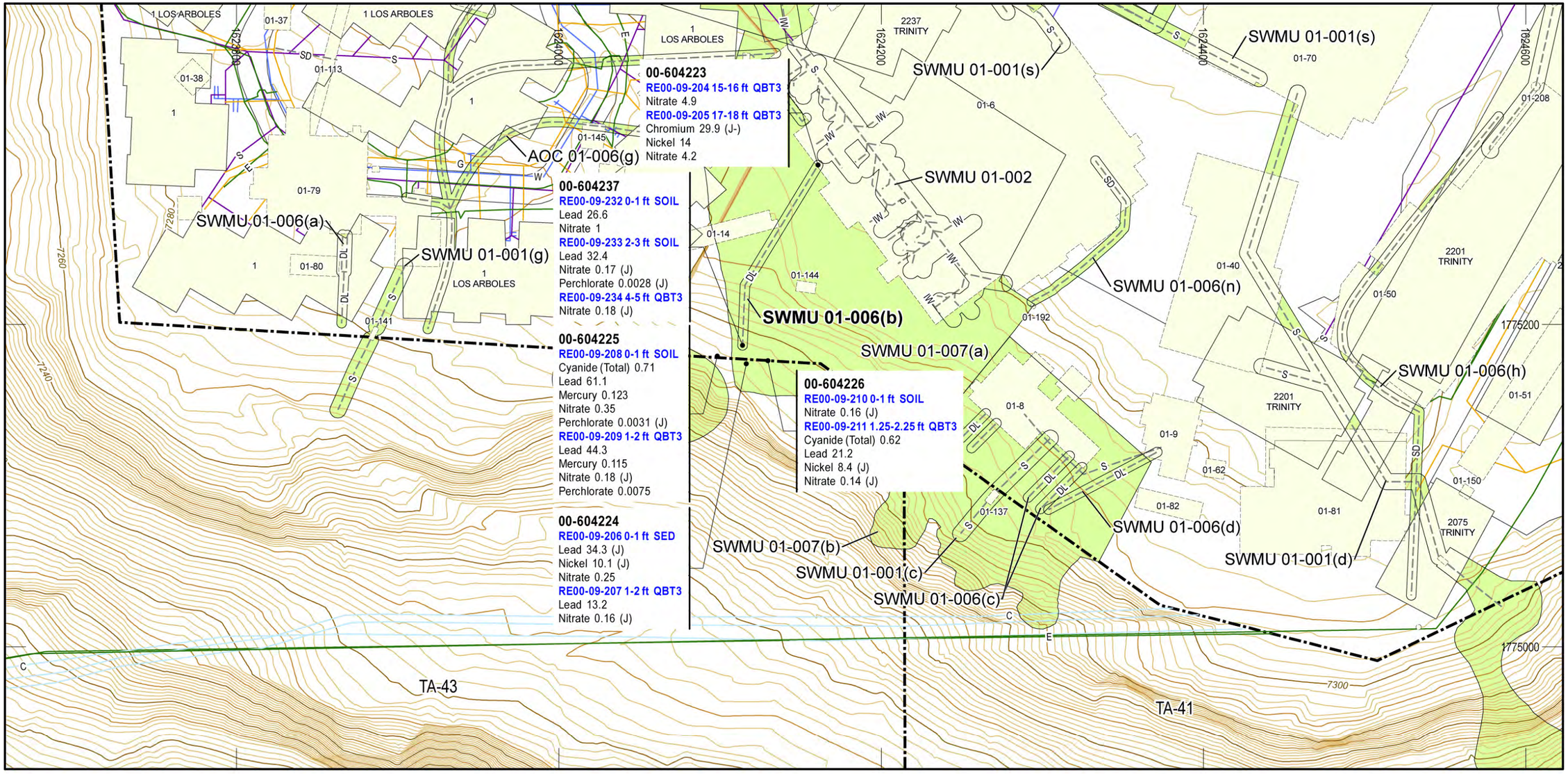


Figure 6.20-2 Inorganic COPCs detected or detected above BVs at SWMU 01-006(b)

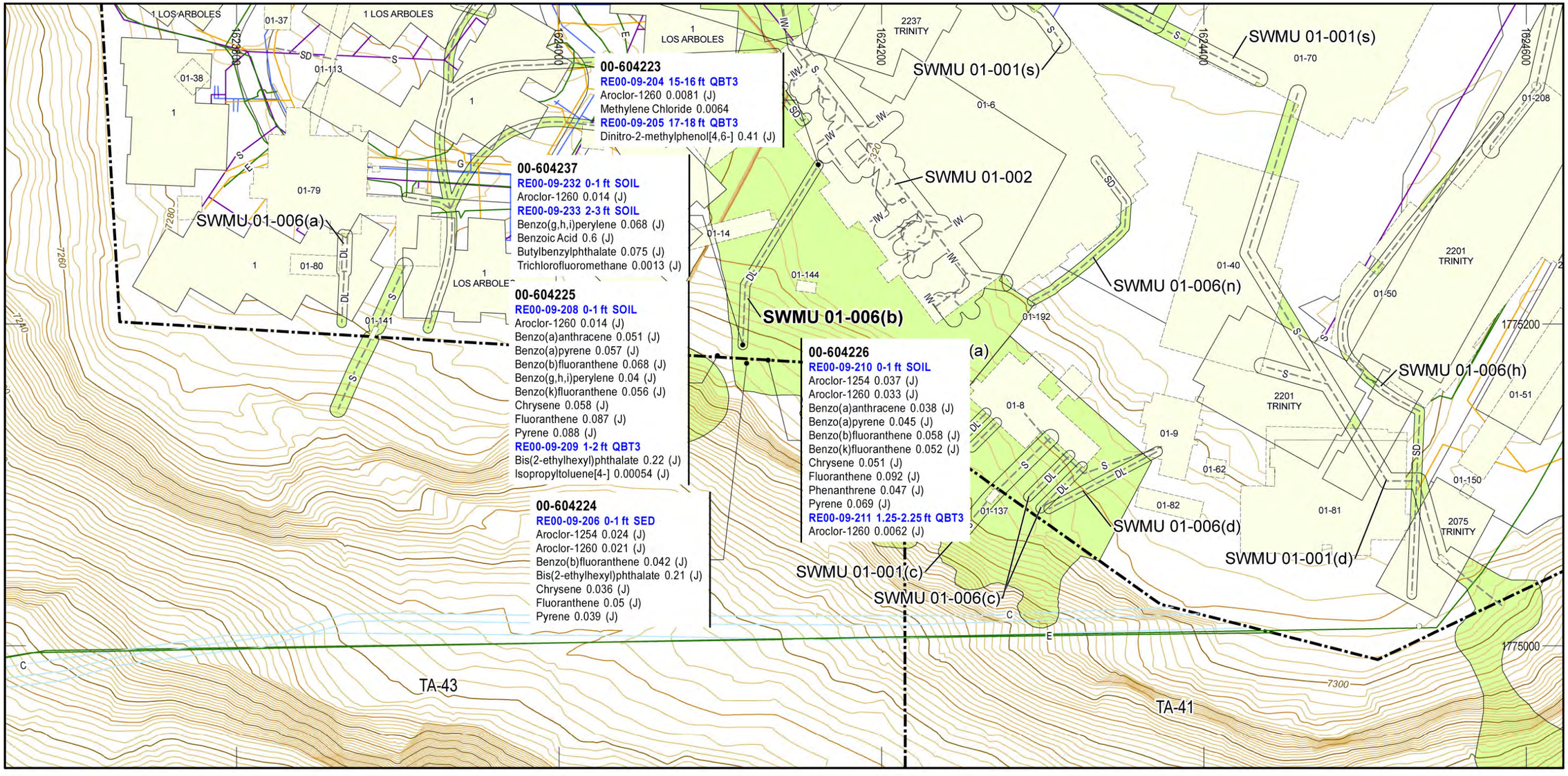


Figure 6.20-3 Organic COPCs detected at SWMU 01-006(b)

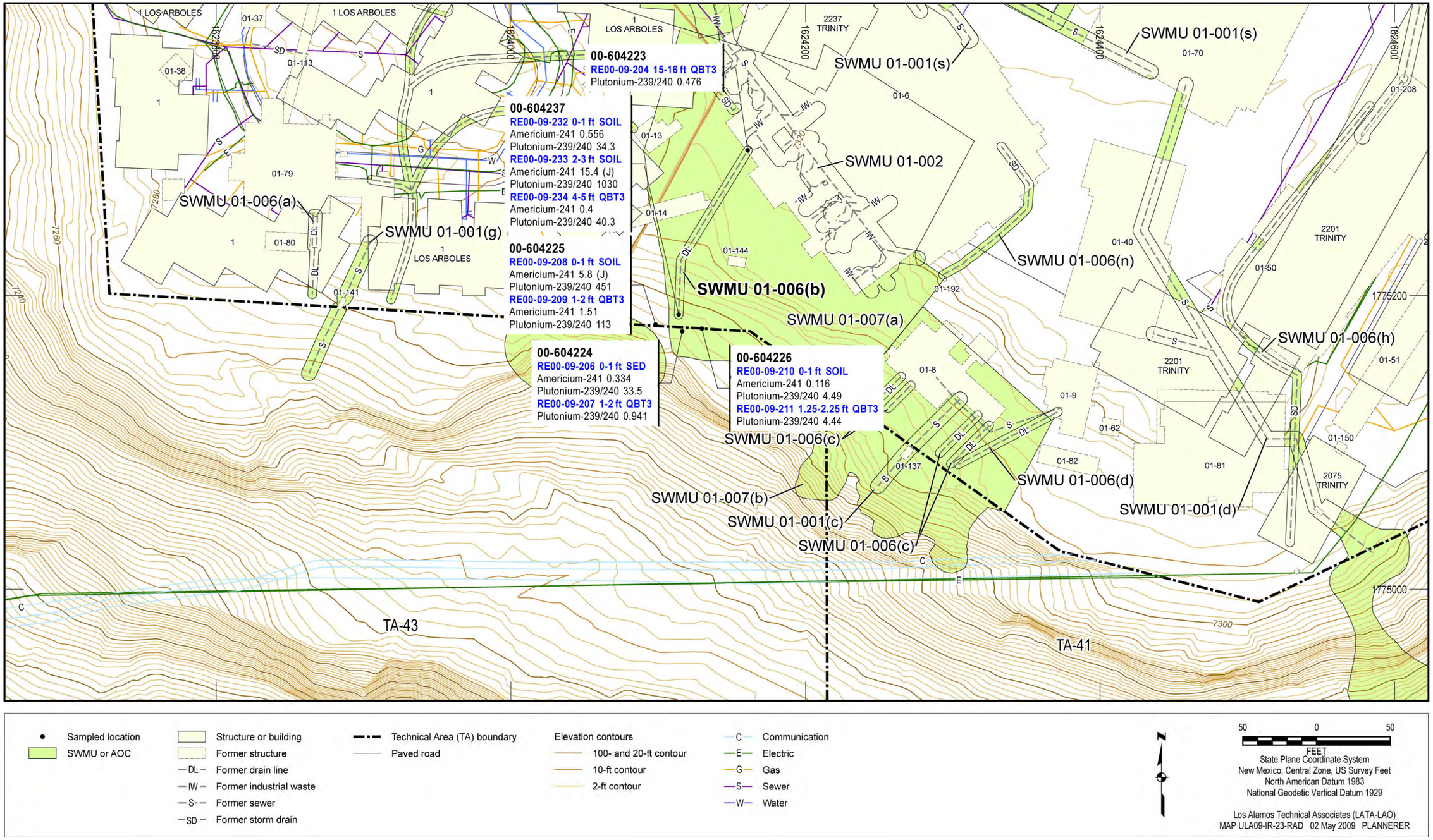


Figure 6.20-4 Radionuclide COPCs detected or detected above BVs/FVs at SWMU 01-006(b)

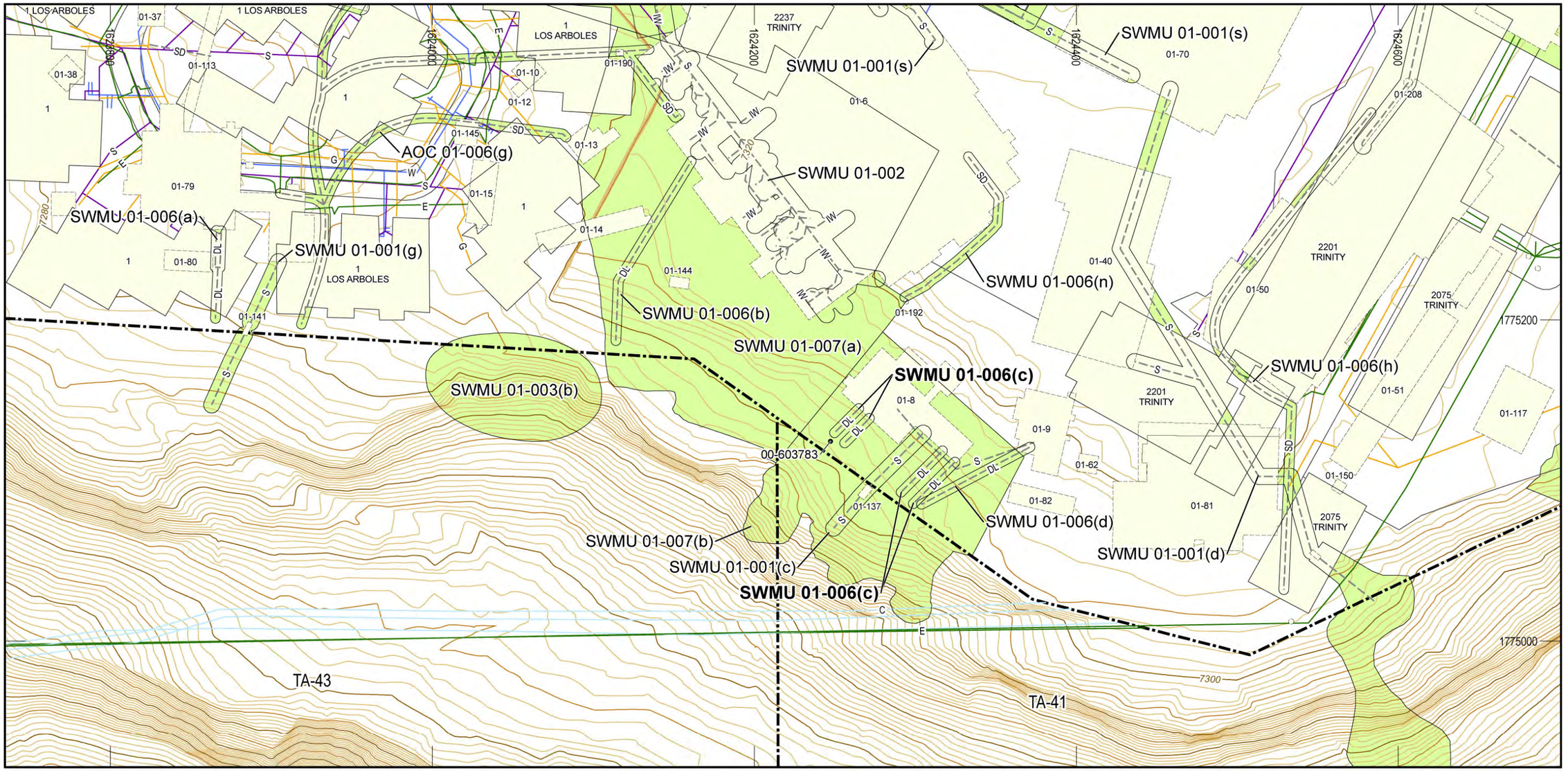


Figure 6.21-1 SWMU 01-006(c) site map and sampling locations

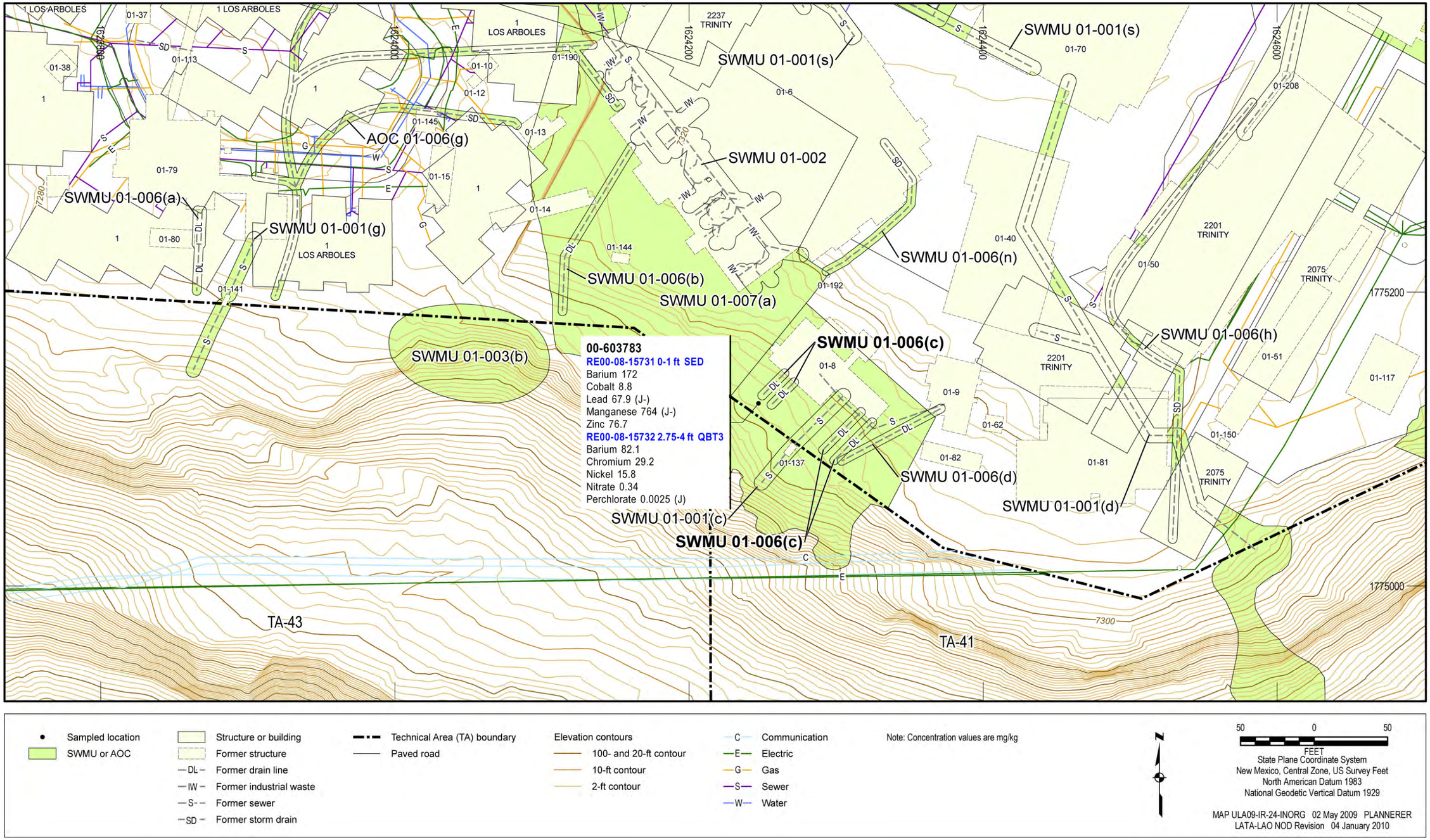


Figure 6.21-2 Inorganic COPCs detected or detected above BVs at SWMU 01-006(c)

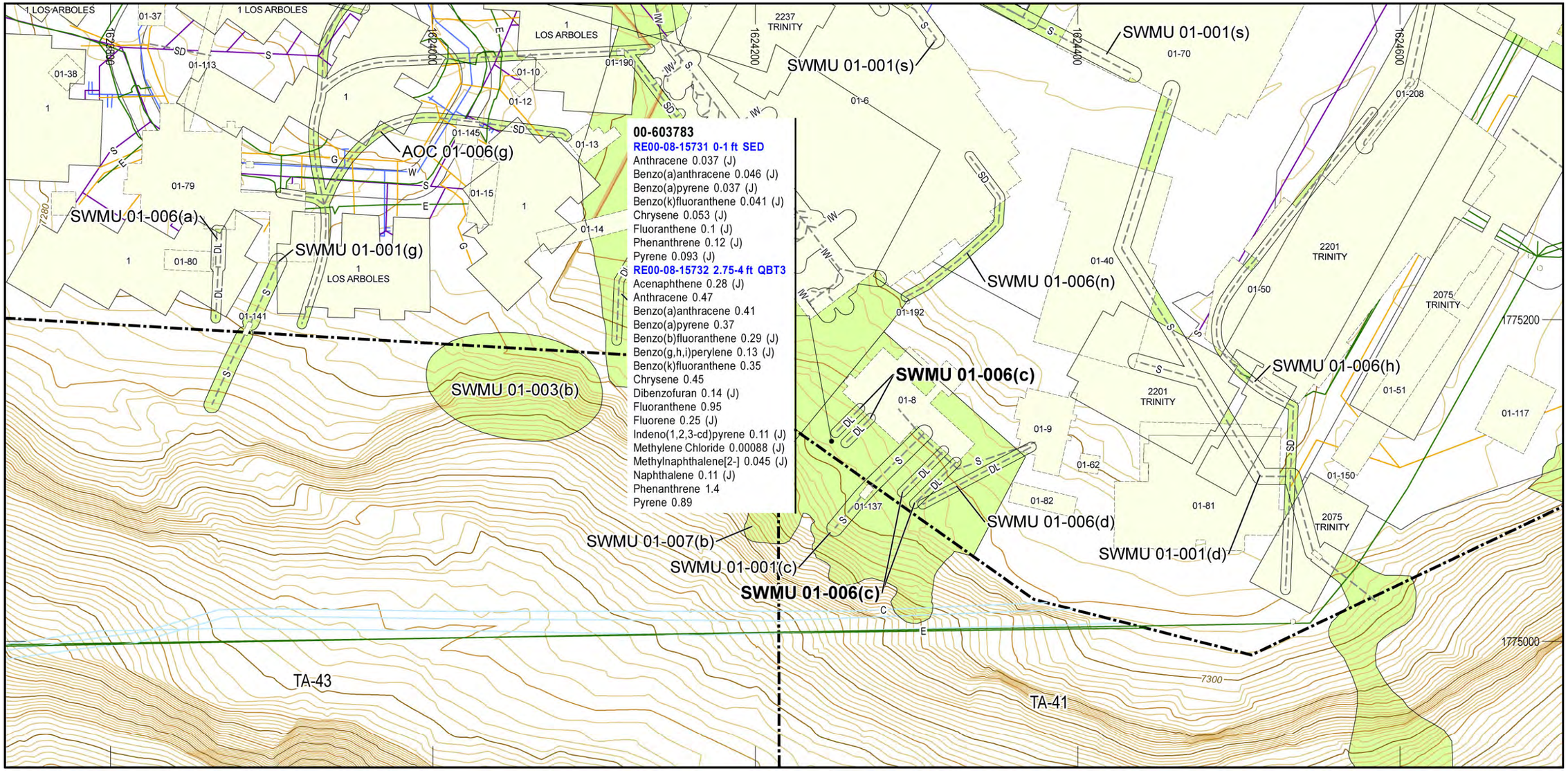


Figure 6.21-3 Organic COPCs detected at SWMU 01-006(c)

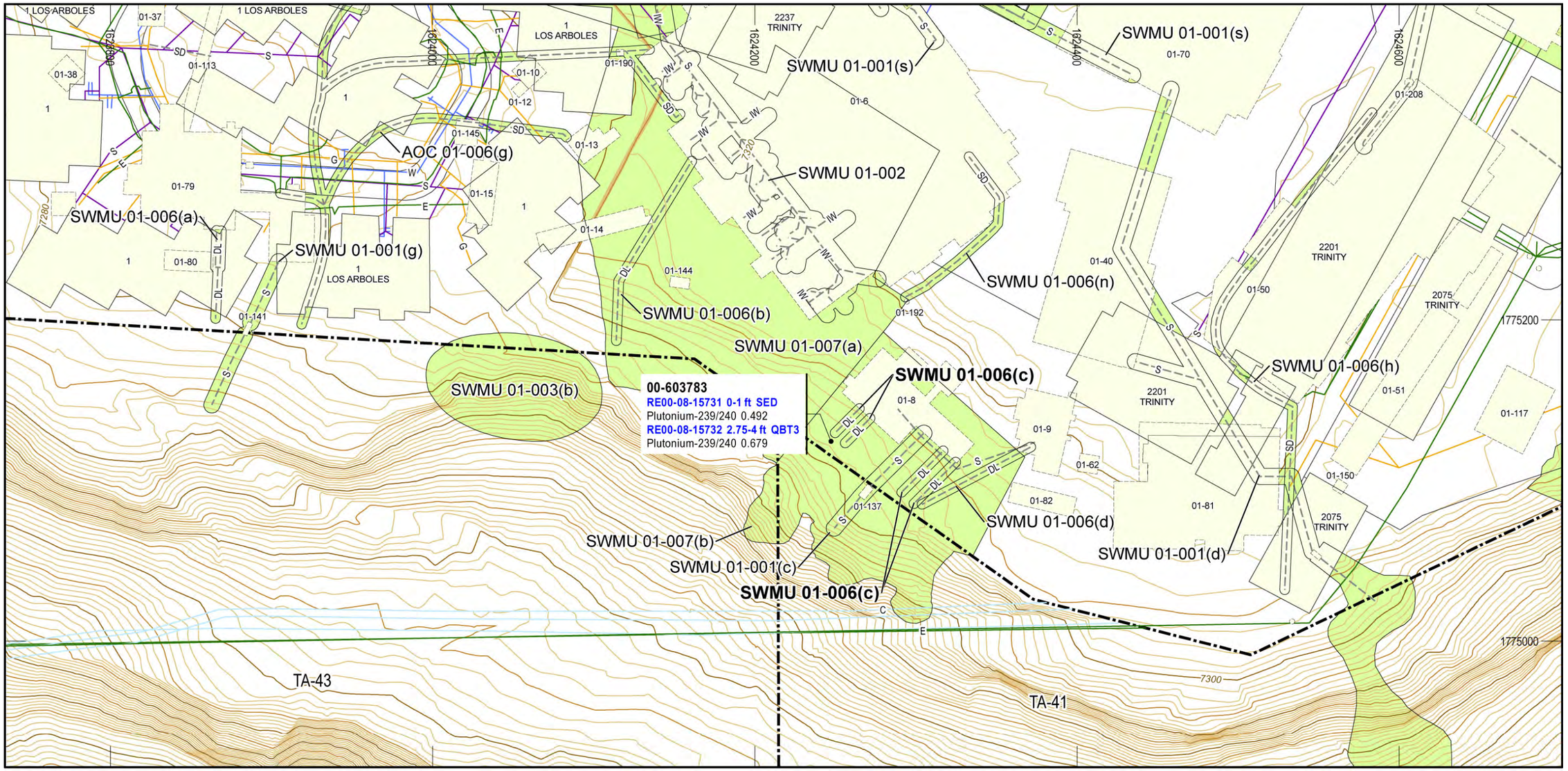


Figure 6.21-4 Radionuclide COPCs detected or detected above BVs/FVs at SWMU 01-006(c)

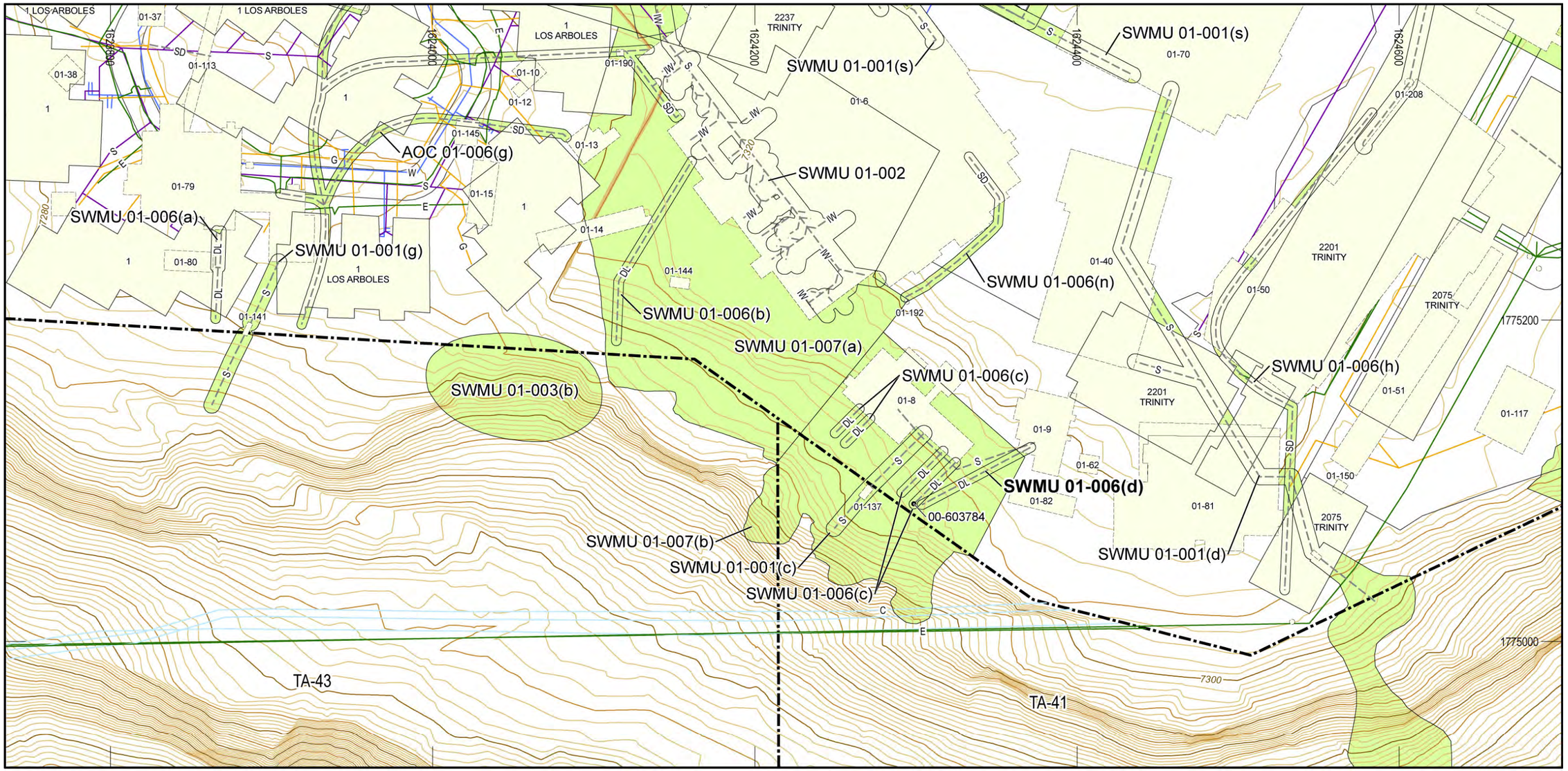


Figure 6.22-1 SWMU 01-006(d) site map and sampling locations

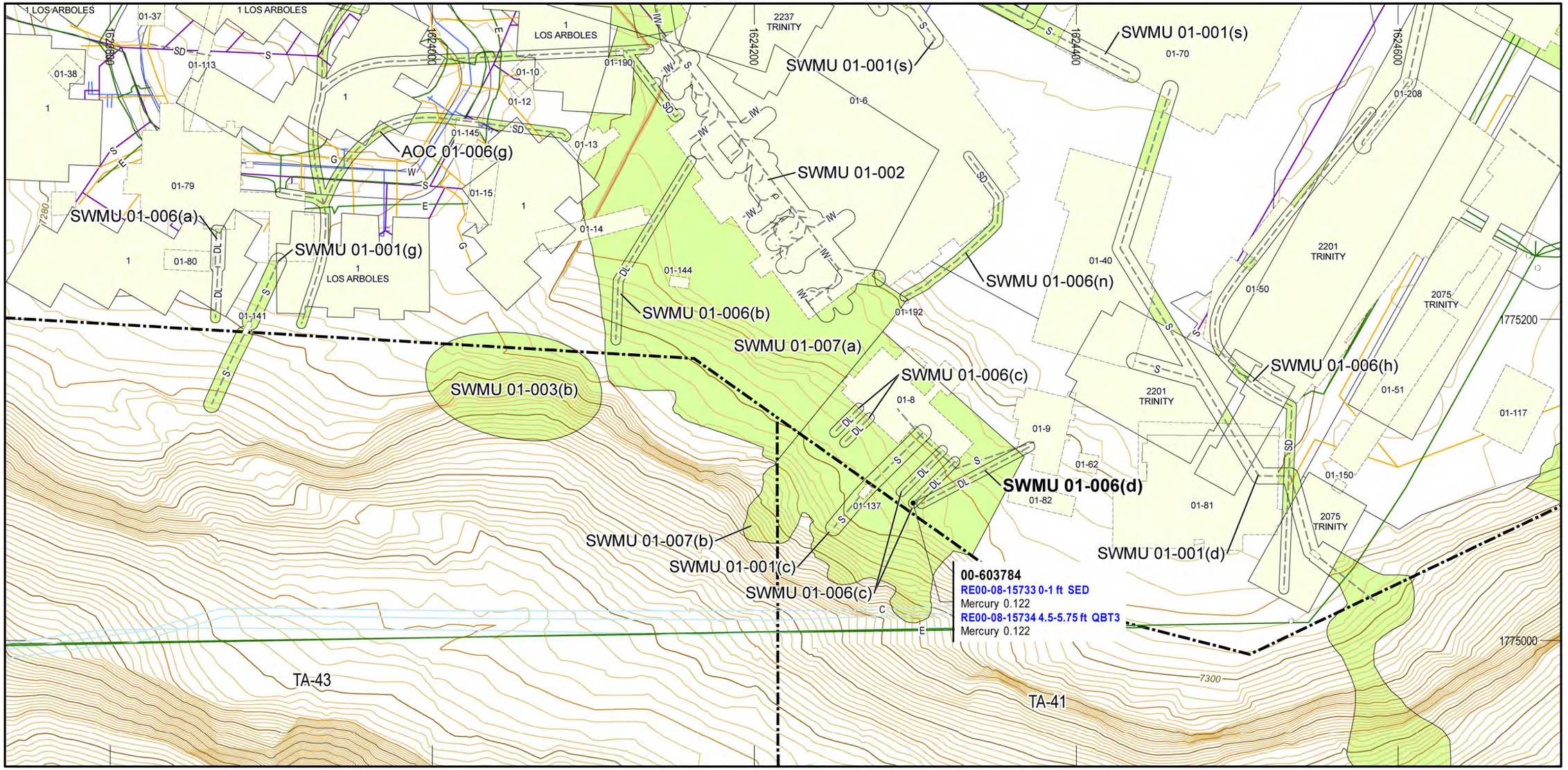


Figure 6.22-2 Inorganic COPCs detected or detected above BVs at SWMU 01-006(d)

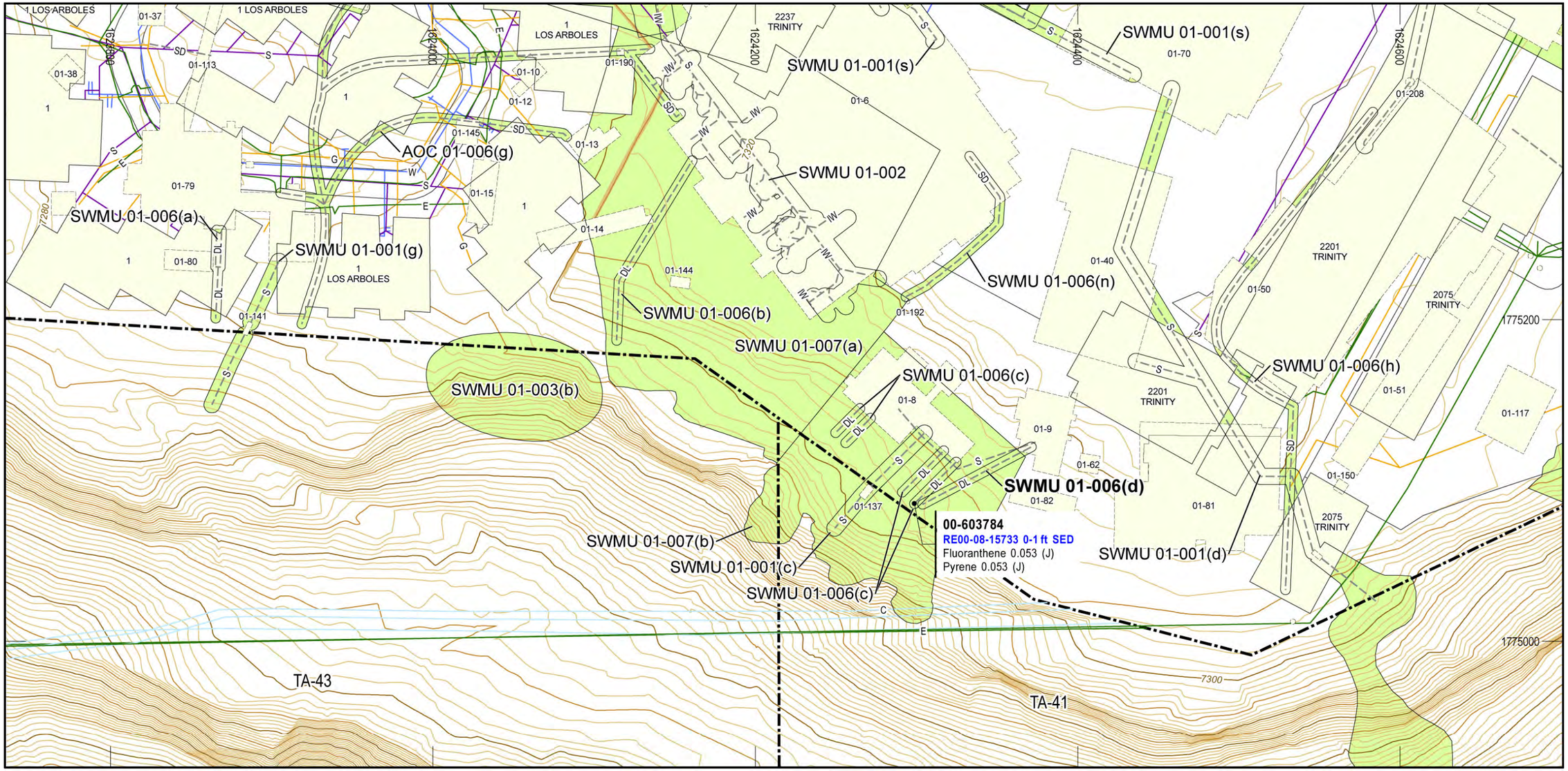


Figure 6.22-3 Organic COPCs detected at SWMU 01-006(d)

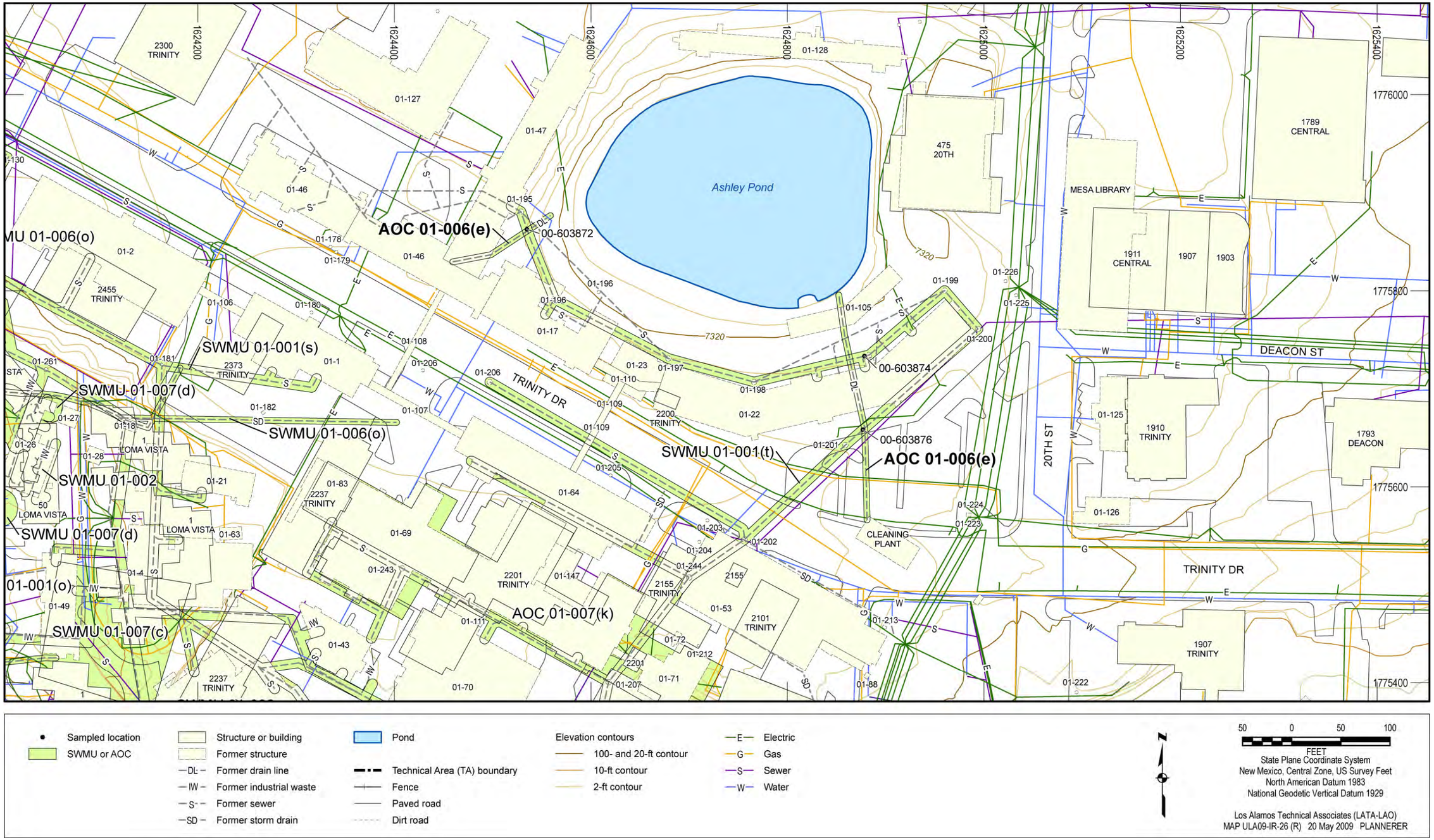


Figure 6.23-1 AOC 01-006(e) site map and sampling locations

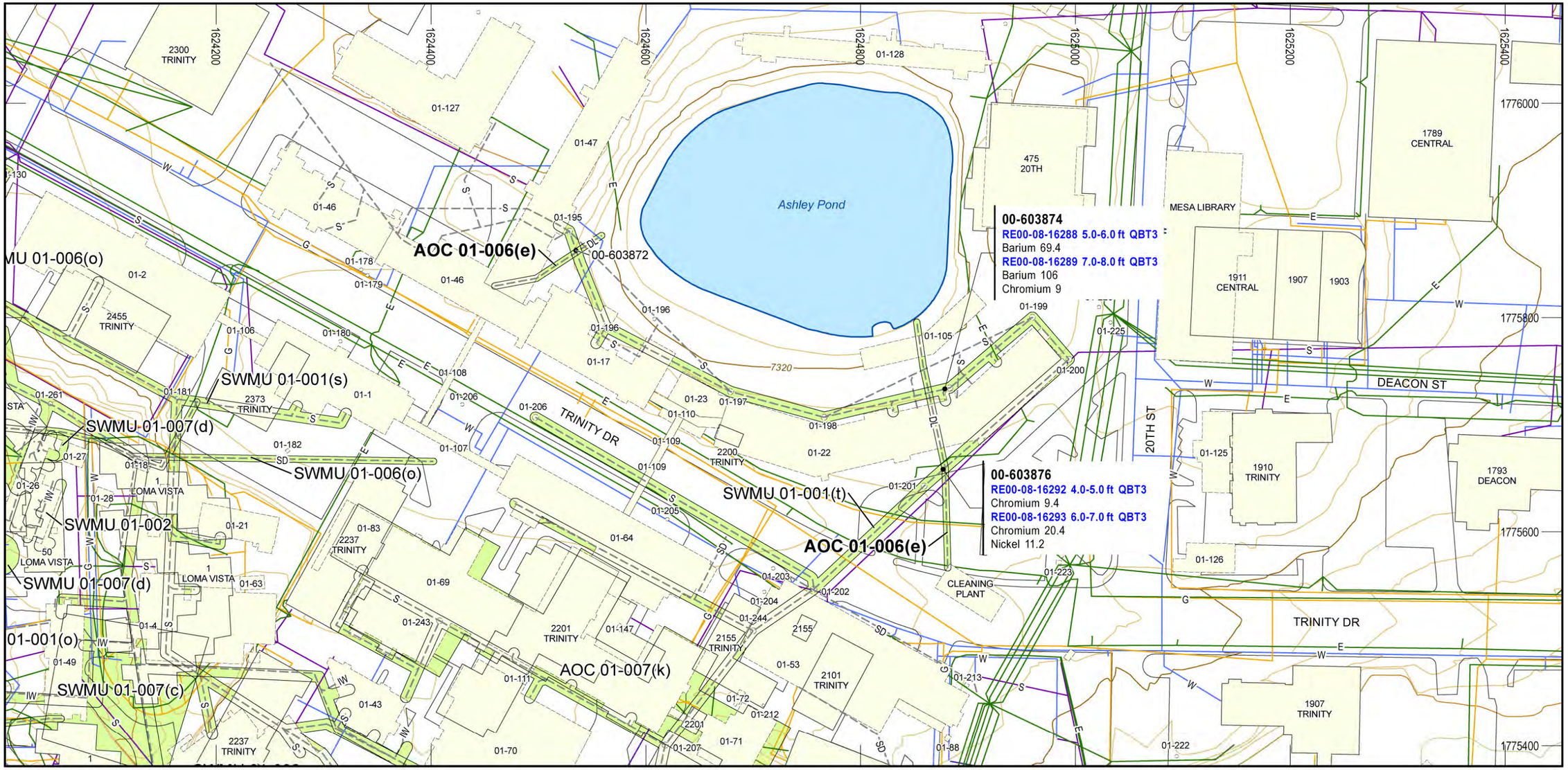


Figure 6.23-2 Inorganic COPCs detected or detected above BVs at AOC 01-006(e)

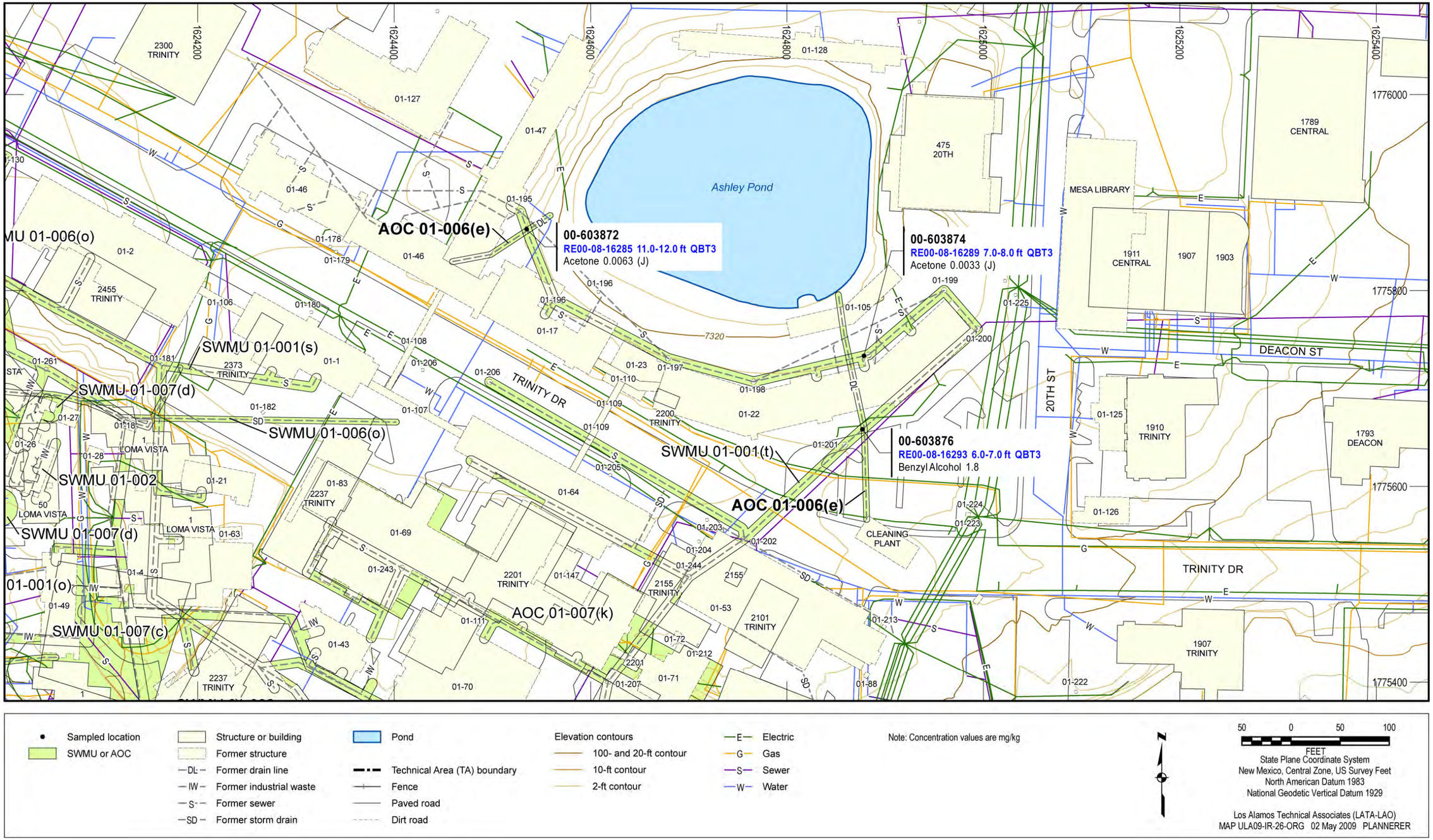


Figure 6.23-3 Organic COPCs detected at AOC 01-006(e)

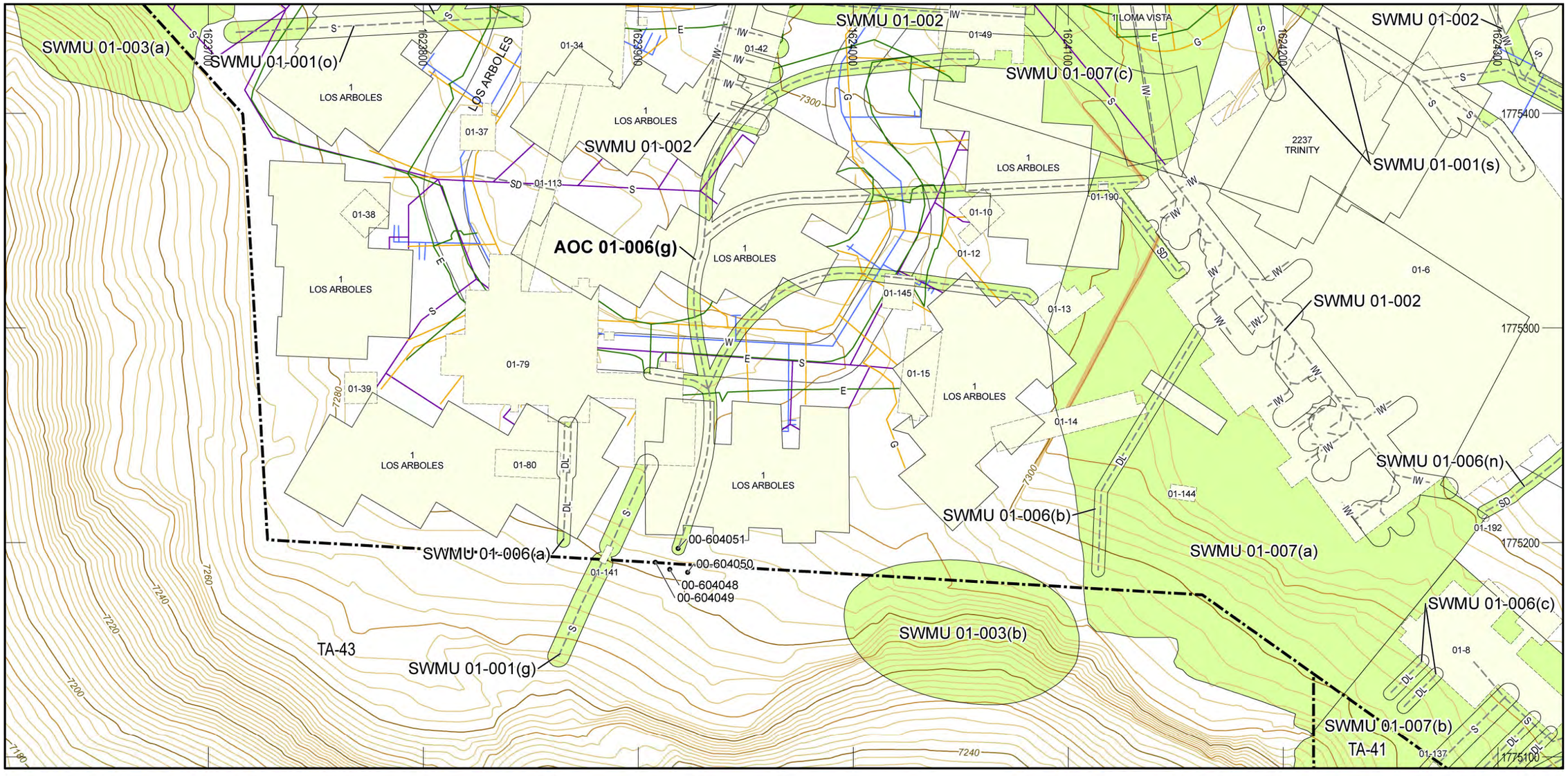


Figure 6.24-1 AOC 01-006(g) site map and sampling locations

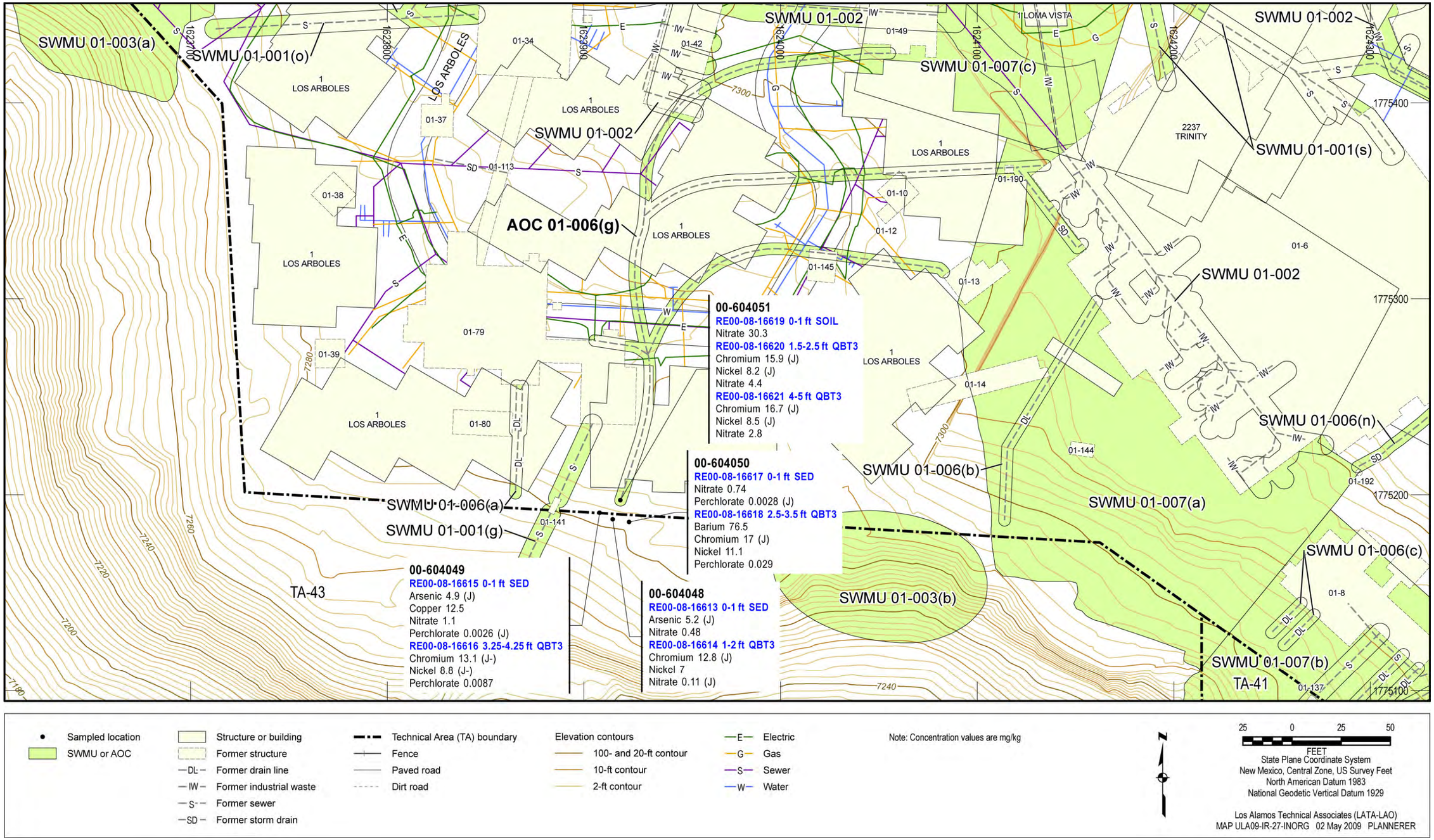


Figure 6.24-2 Inorganic COPCs detected or detected above BVs at AOC 01-006(g)

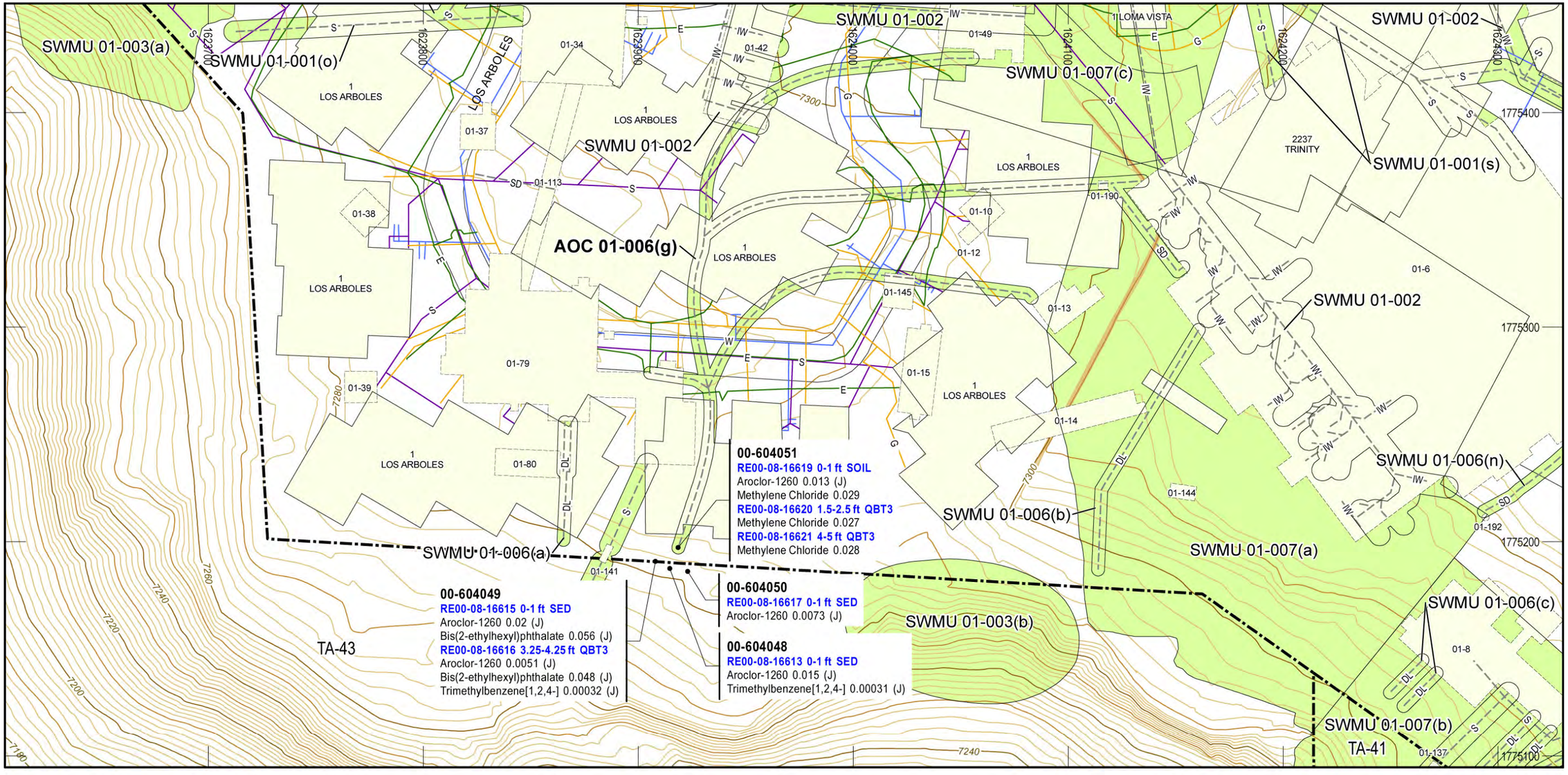


Figure 6.24-3 Organic COPCs detected at AOC 01-006(g)

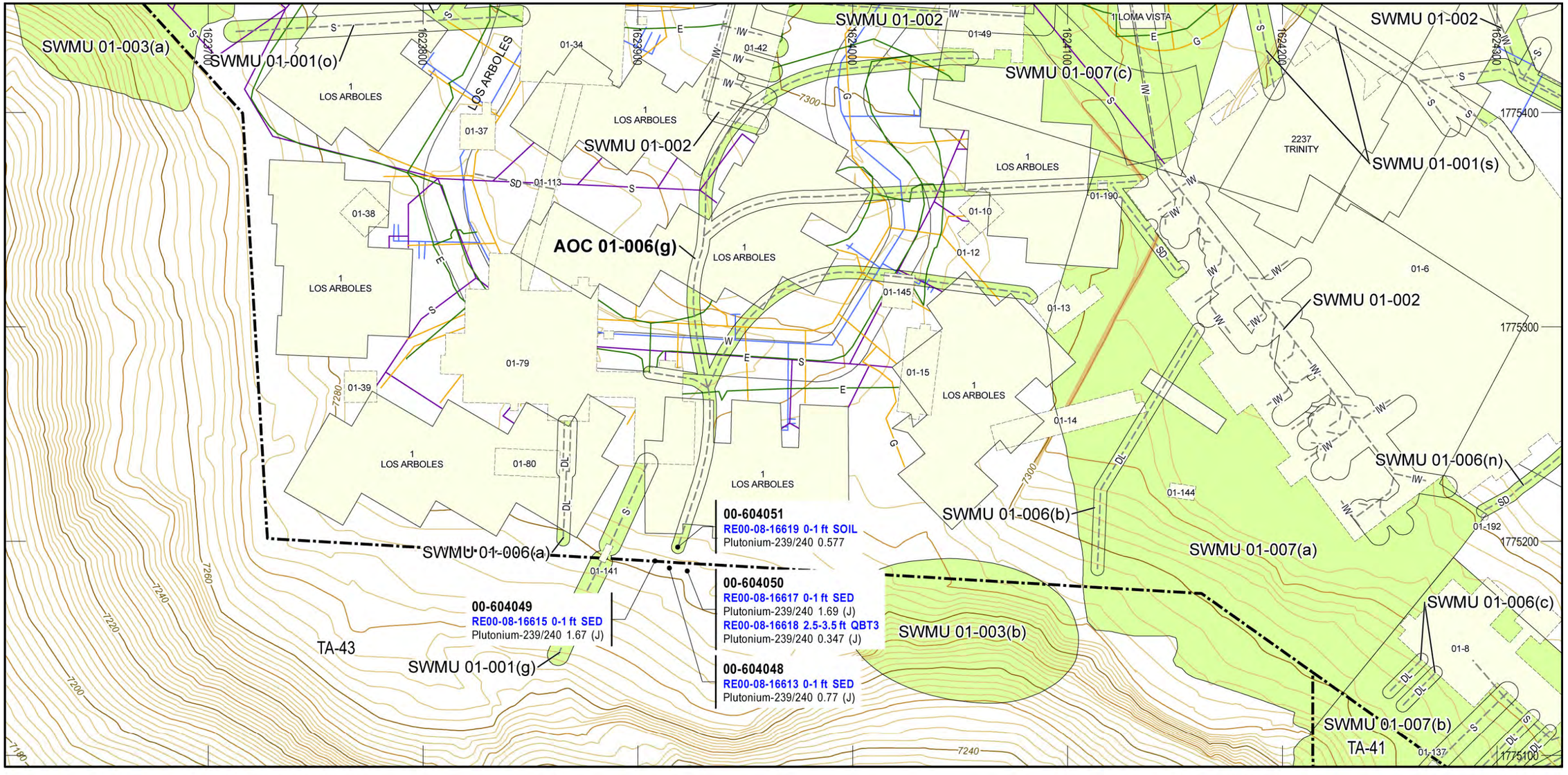


Figure 6.24-4 Radionuclide COPCs detected or detected above BVs/FVs at AOC 01-006(g)

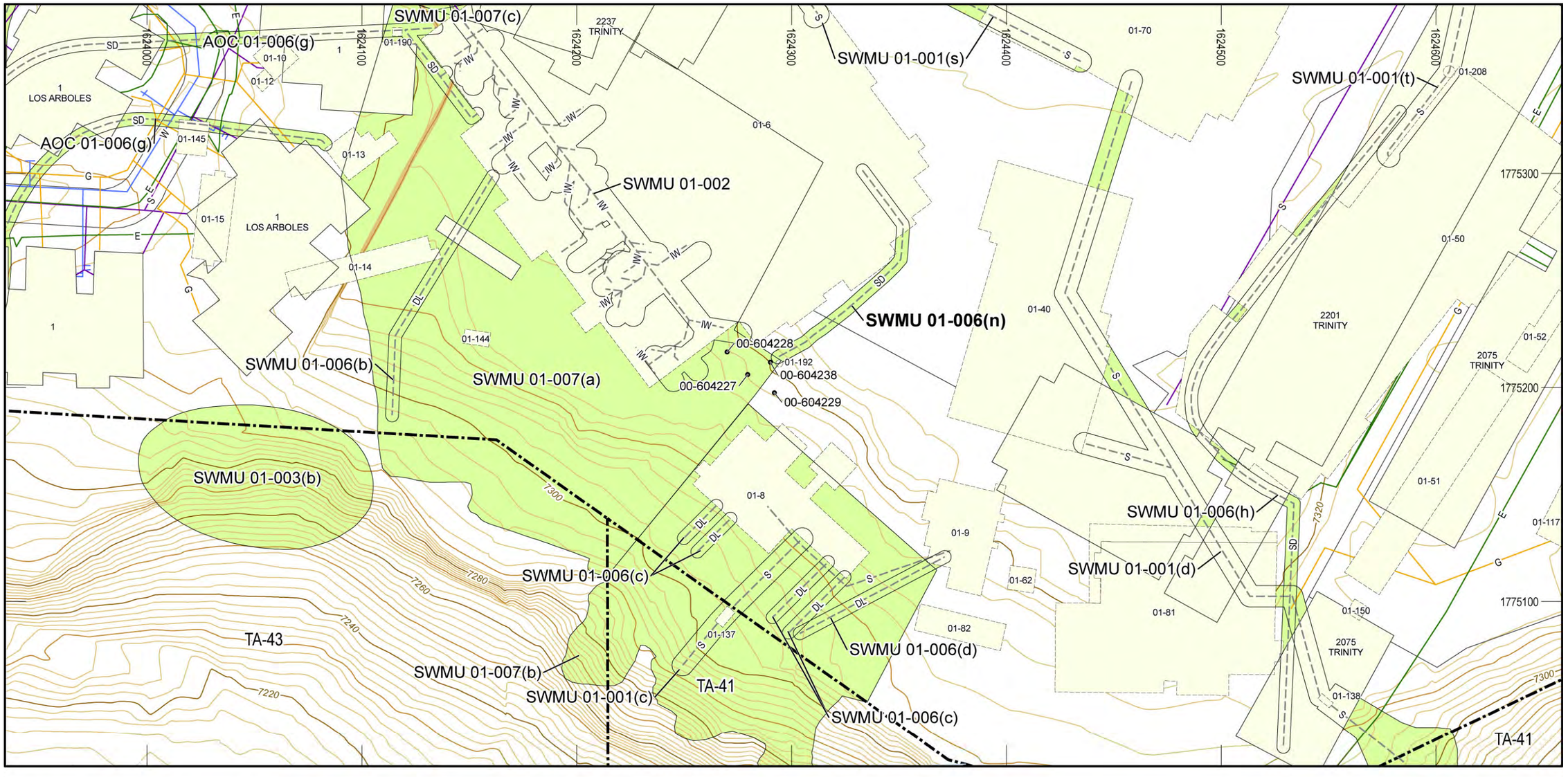


Figure 6.26-1 SWMU 01-006(n) site map and sampling locations

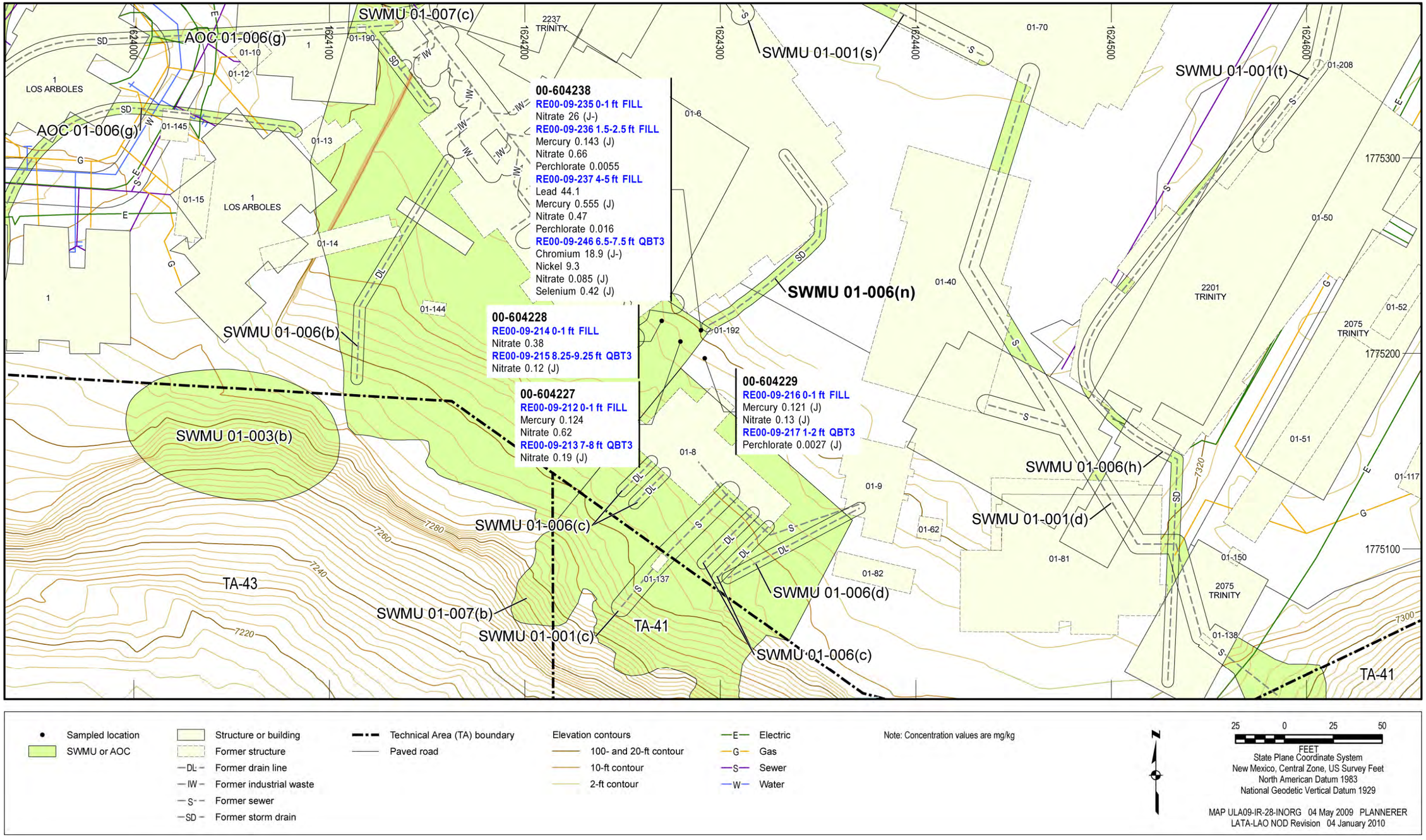


Figure 6.26-2 Inorganic COPCs detected or detected above BVs at SWMU 01-006(n)

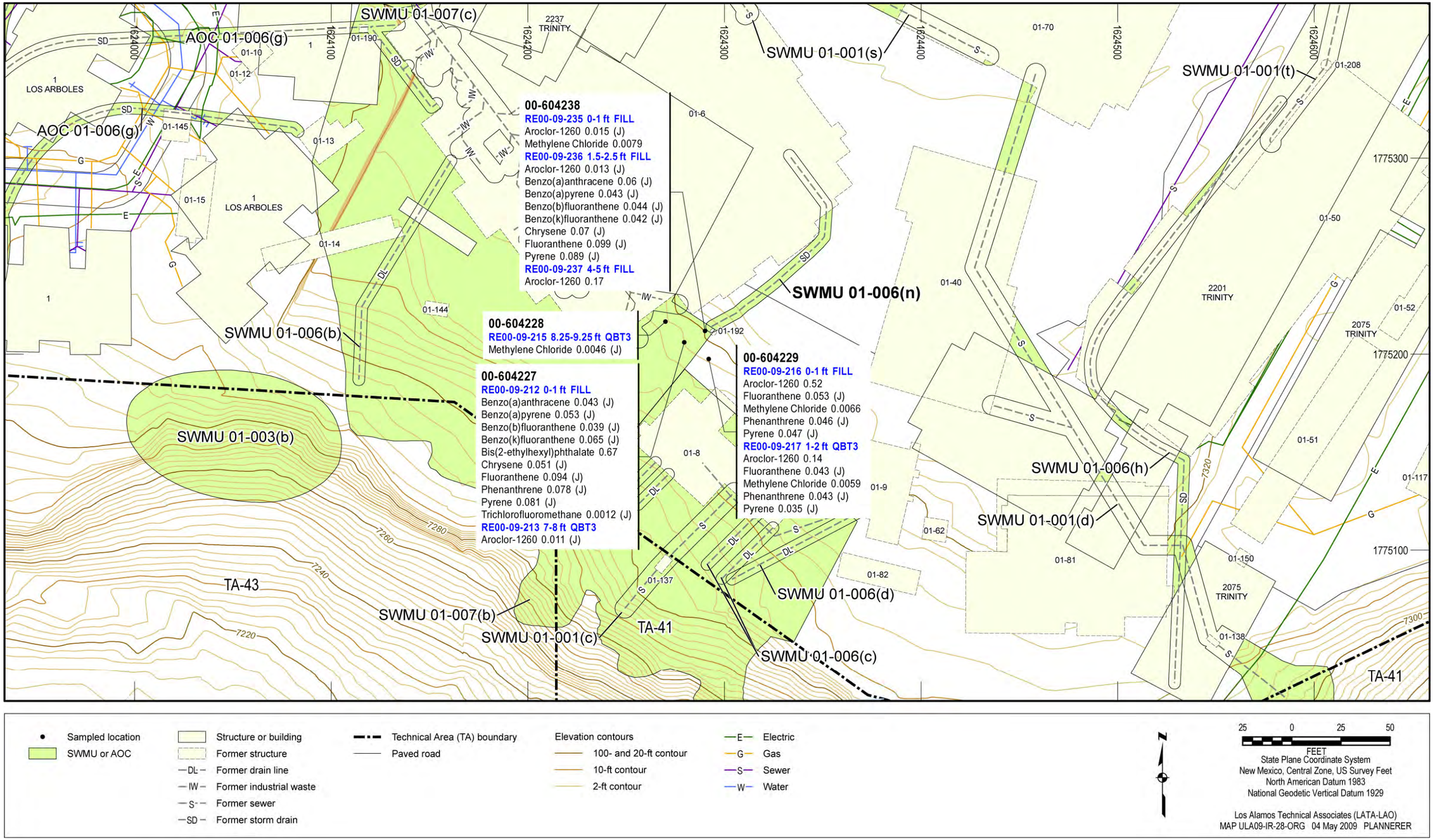


Figure 6.26-3 Organic COPCs detected at SWMU 01-006(n)

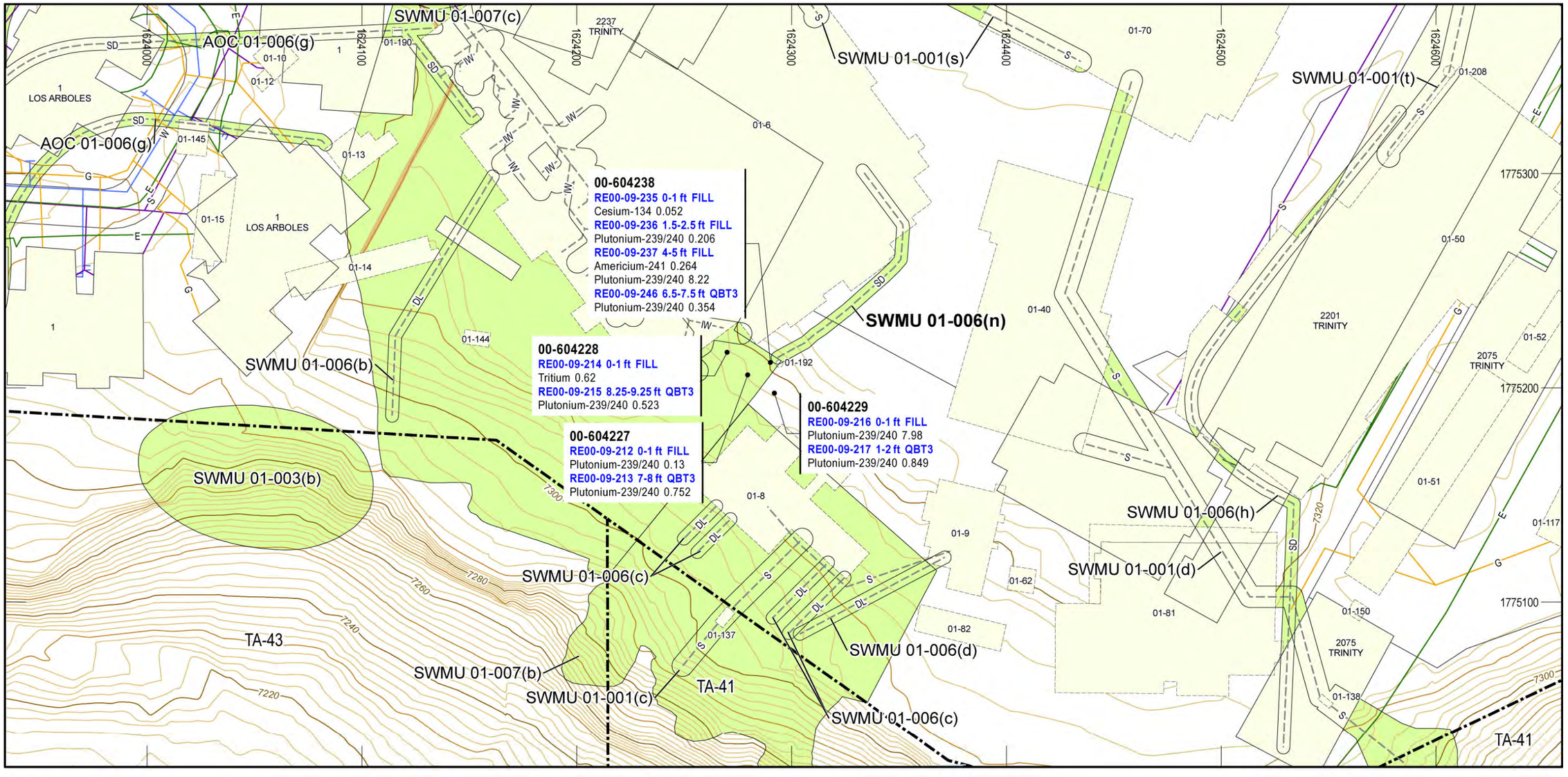


Figure 6.26-4 Radionuclide COPC COPCs detected or detected above BVs/FVs at SWMU 01-006(n)

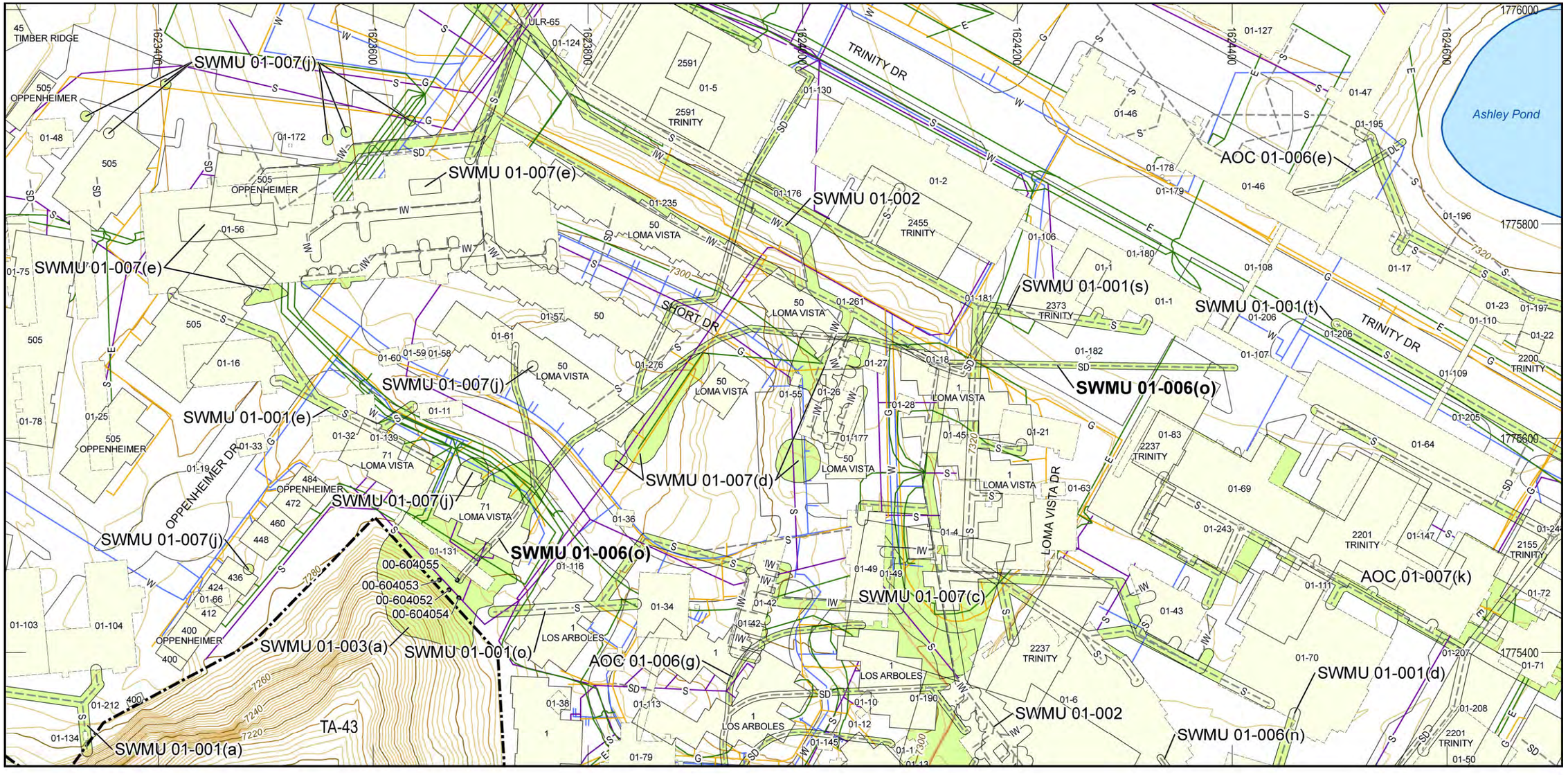


Figure 6.27-1 SWMU 01-006(o) site map and sampling locations

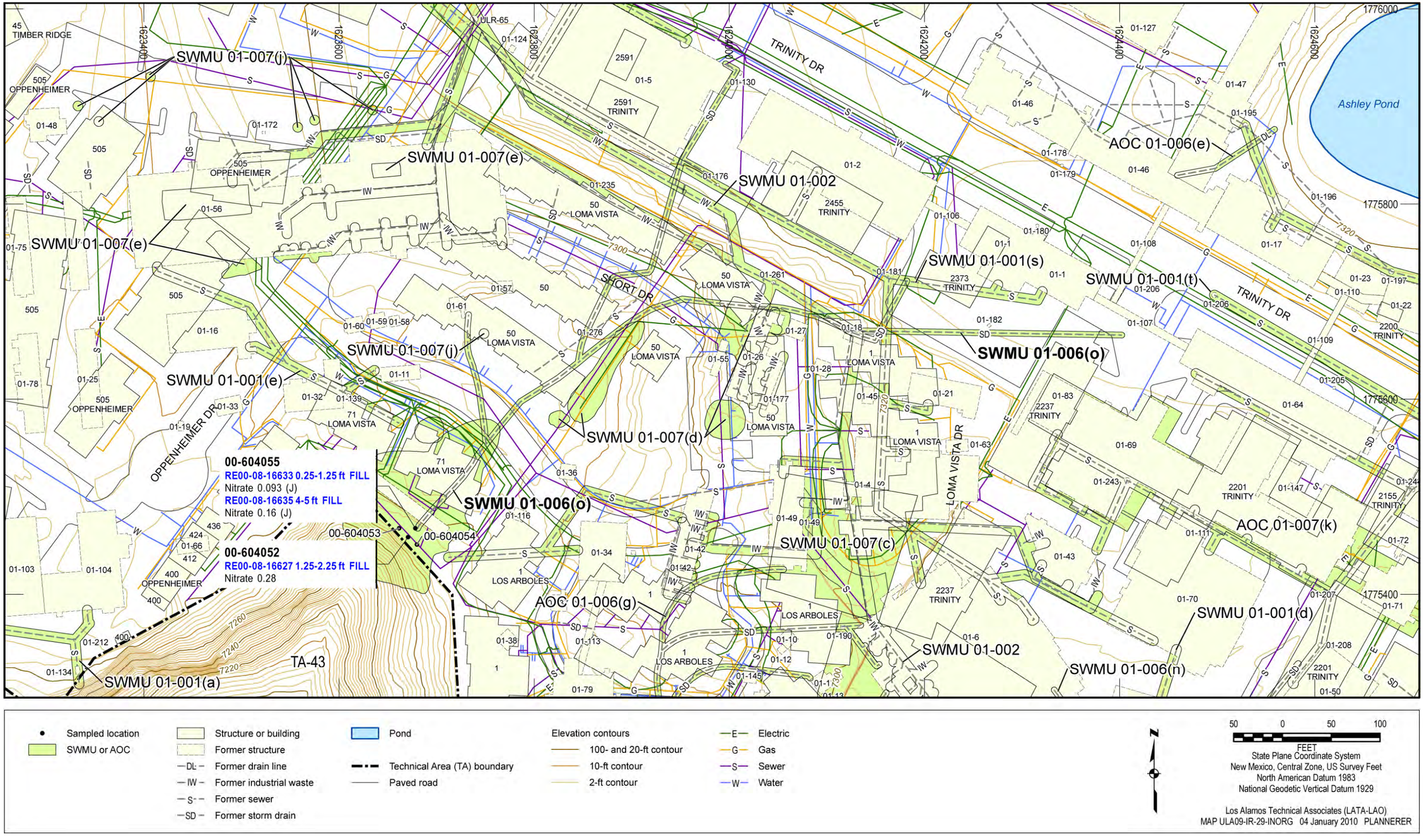


Figure 6.27-2 Inorganic COPCs detected or detected above BVs at SWMU 01-006(o)

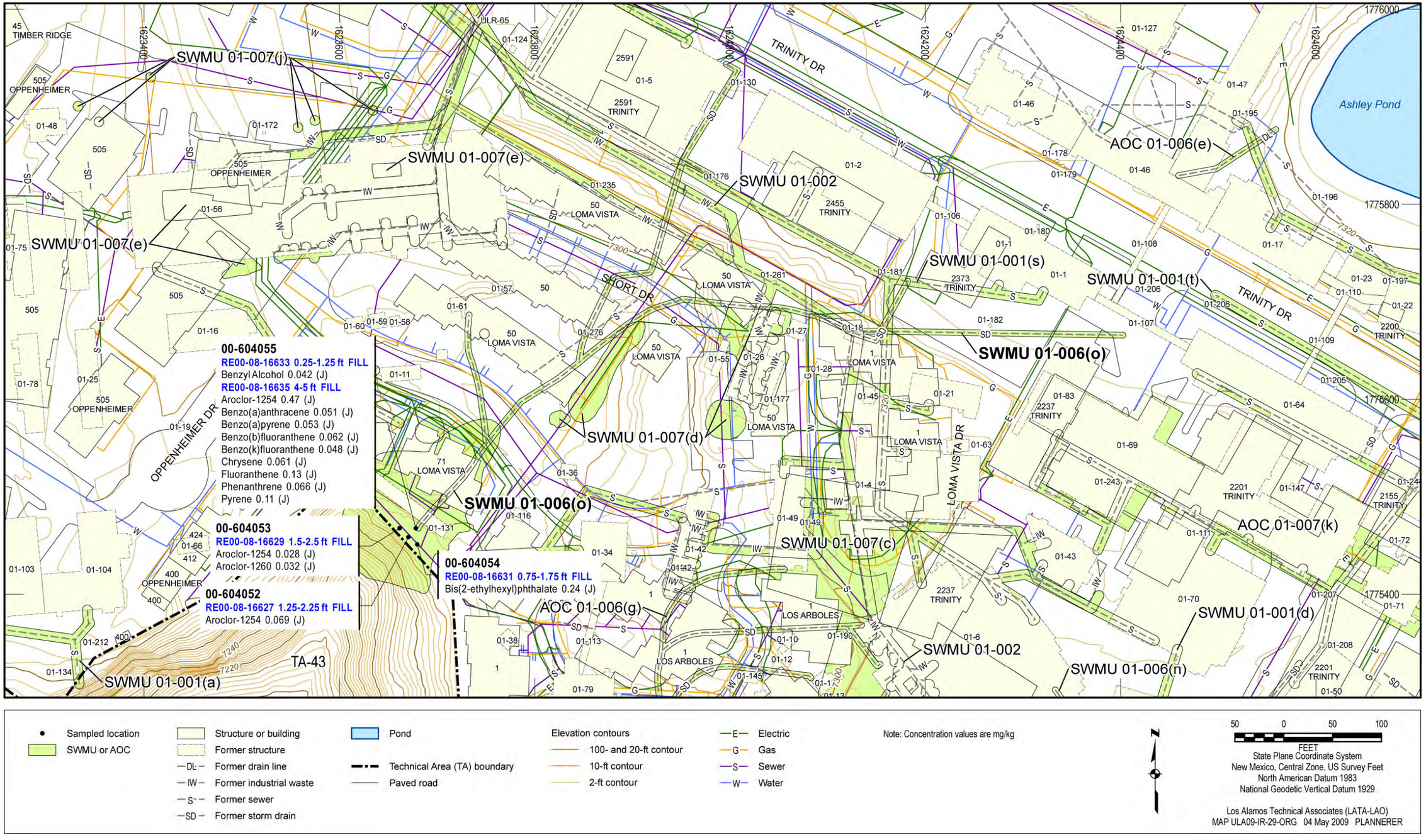


Figure 6.27-3 Organic COPCs detected at SWMU 01-006(o)

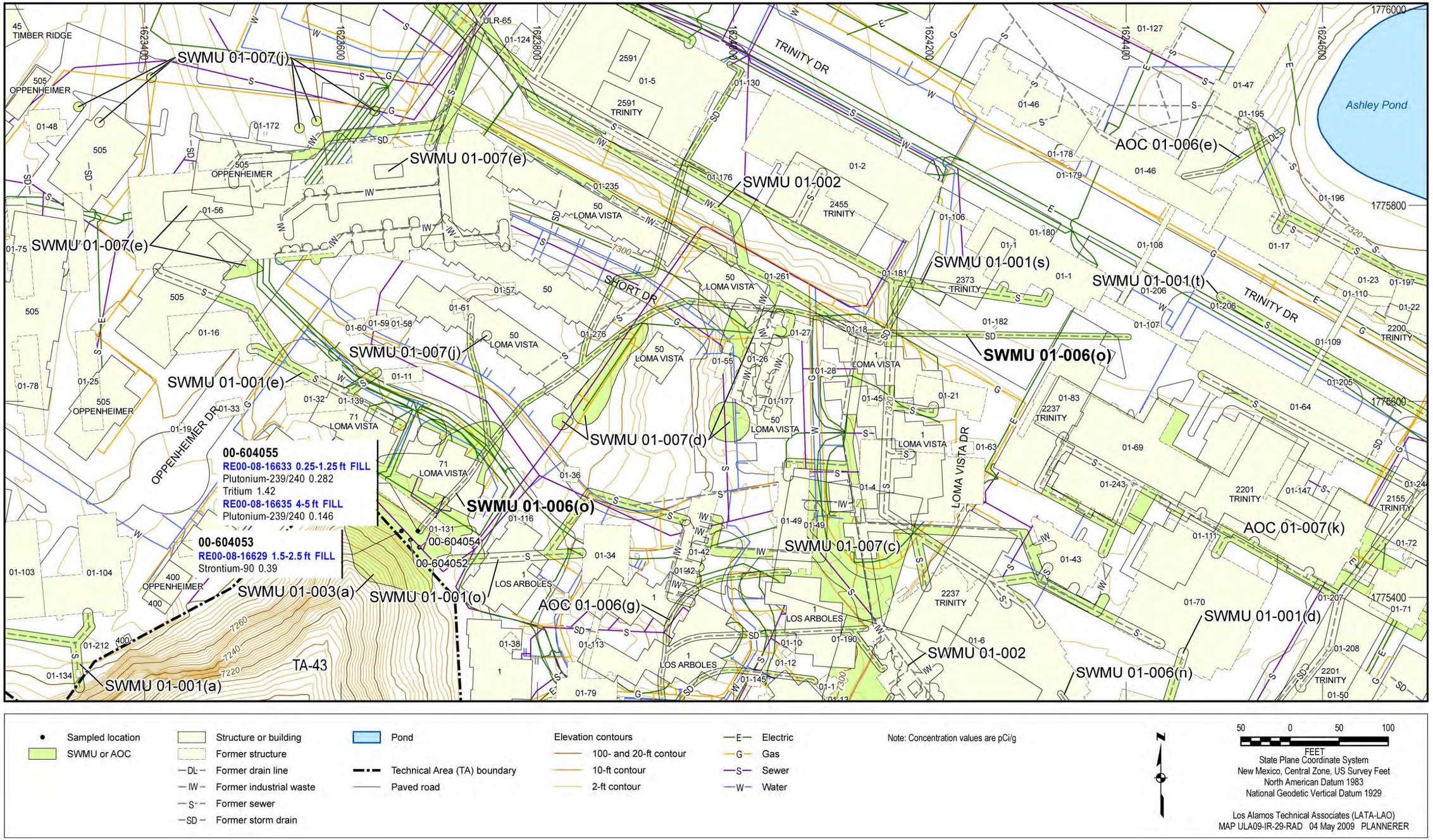


Figure 6.27-4 Radionuclide COPCs detected or detected above BVs/FVs at SWMU 01-006(o)

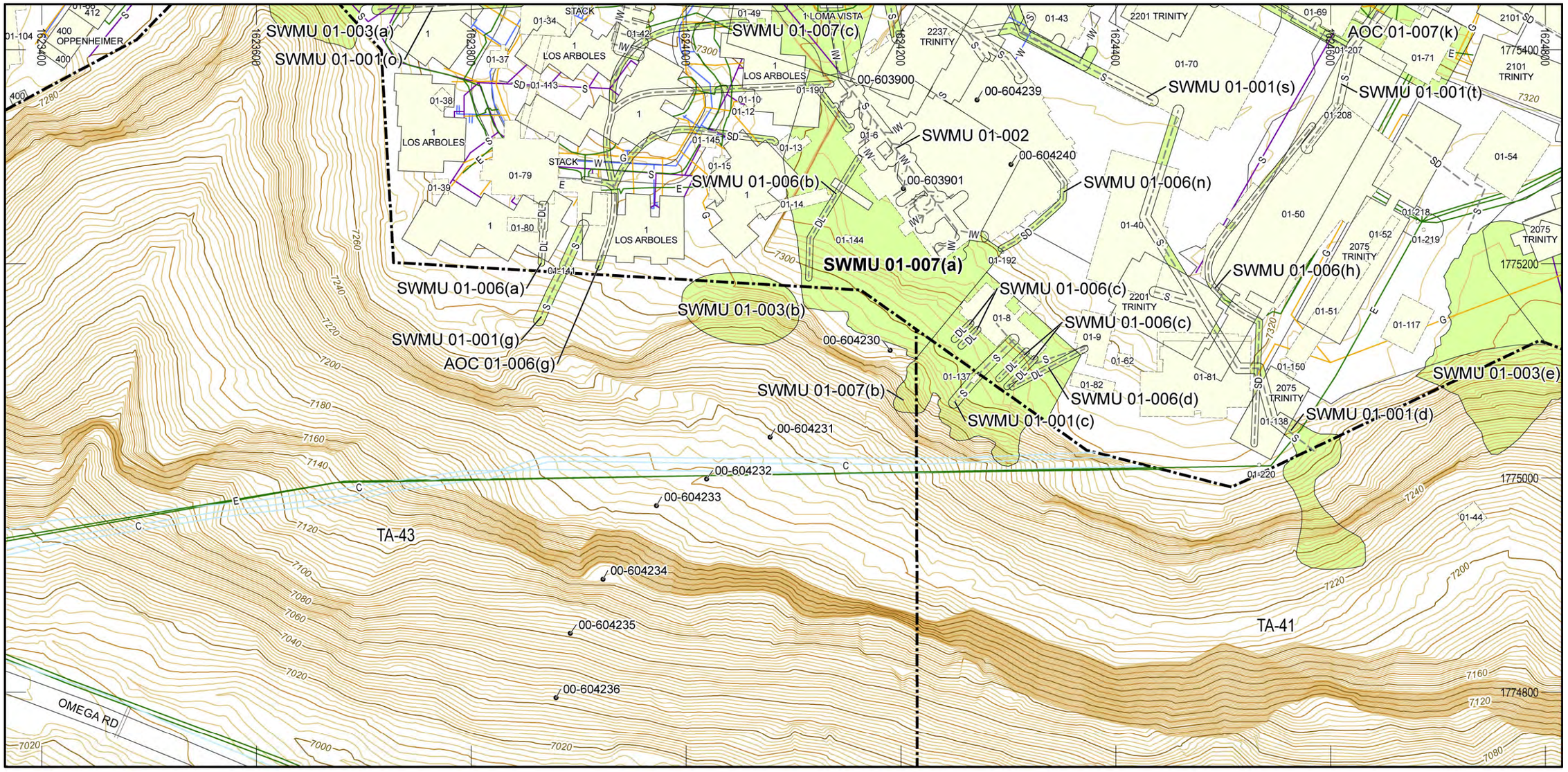


Figure 6.28-1 SWMU 01-007(a) site map and sampling locations

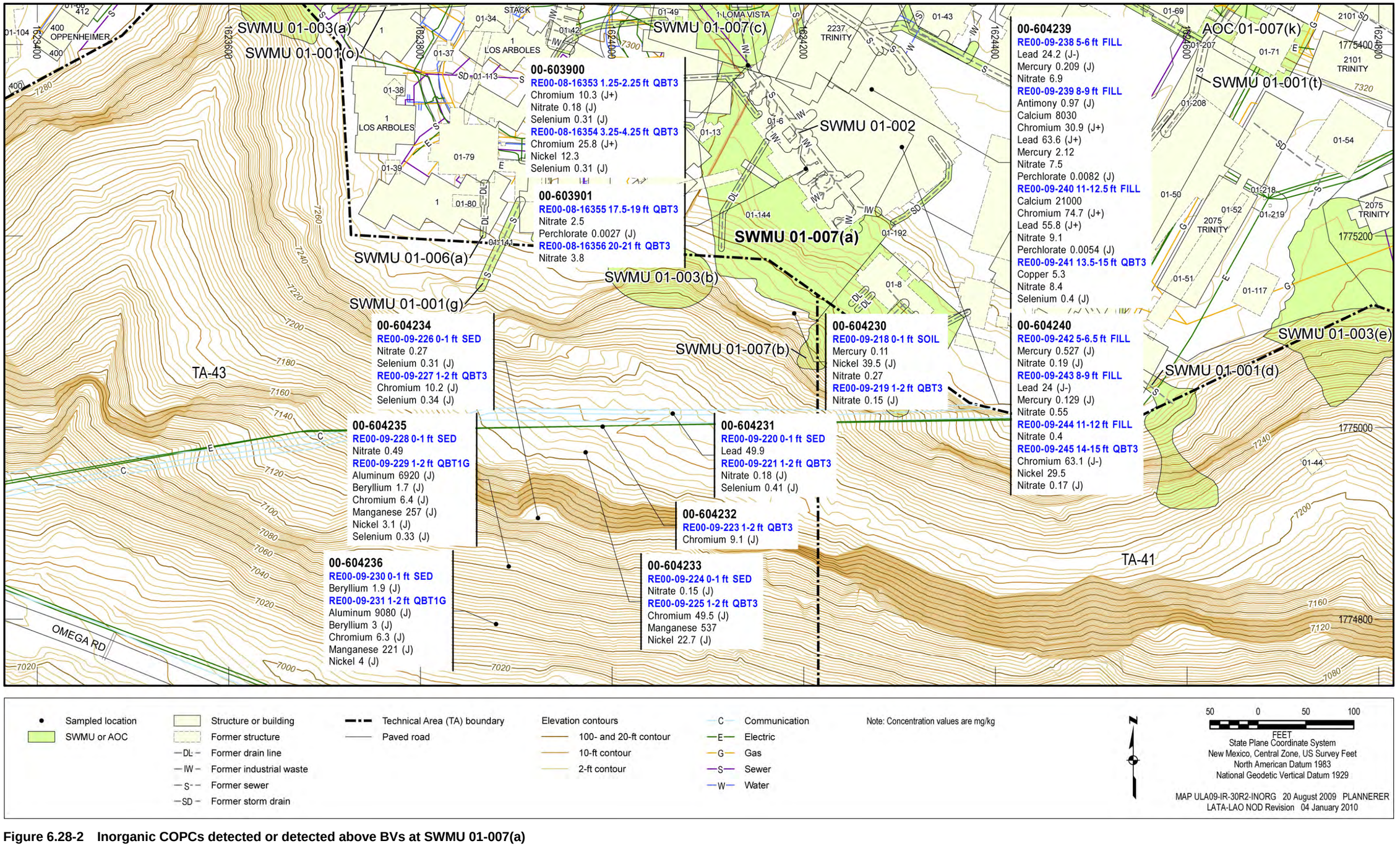


Figure 6.28-2 Inorganic COPCs detected or detected above BVs at SWMU 01-007(a)

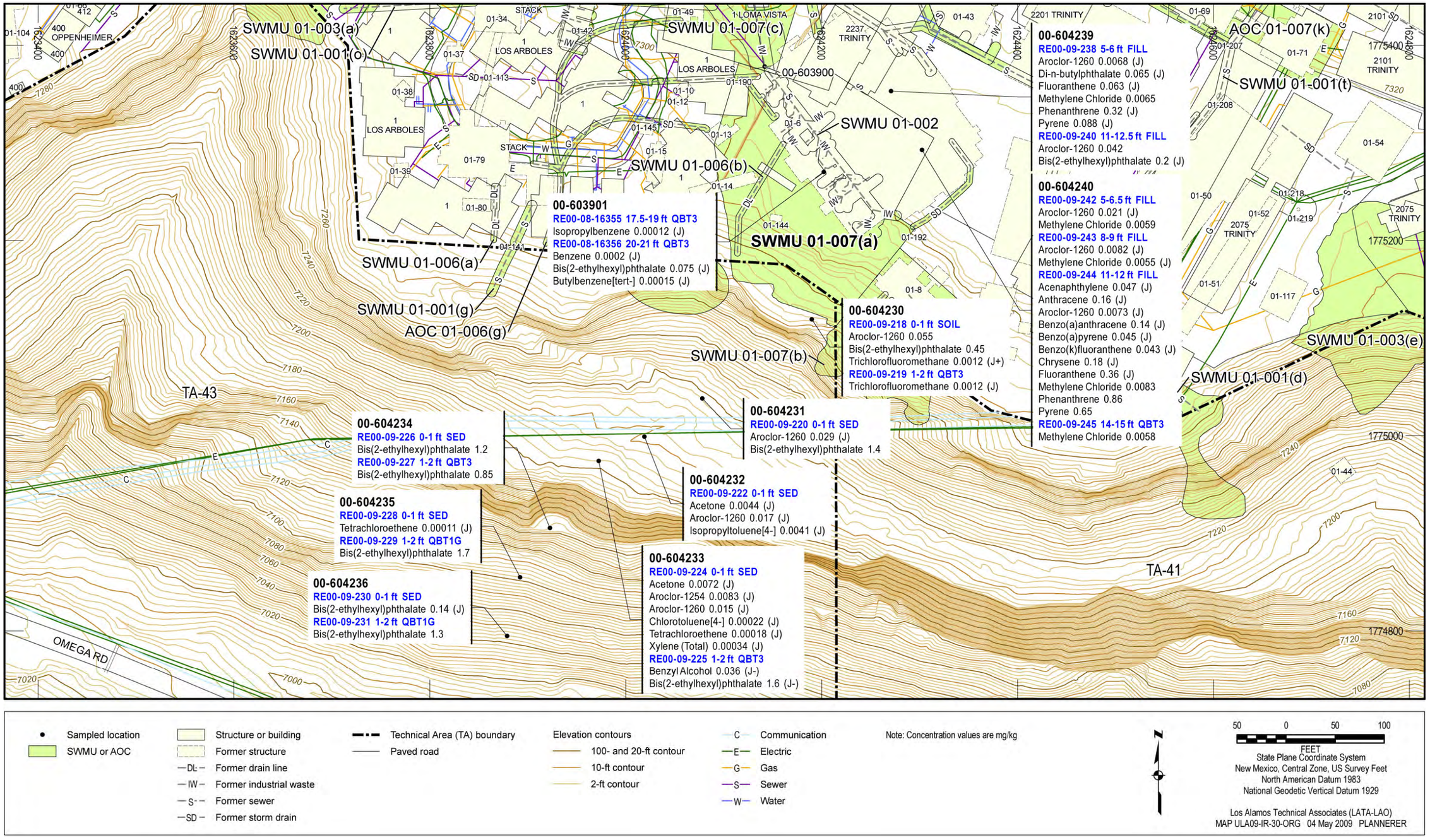


Figure 6.28-3 Organic COPCs detected at SWMU 01-007(a)

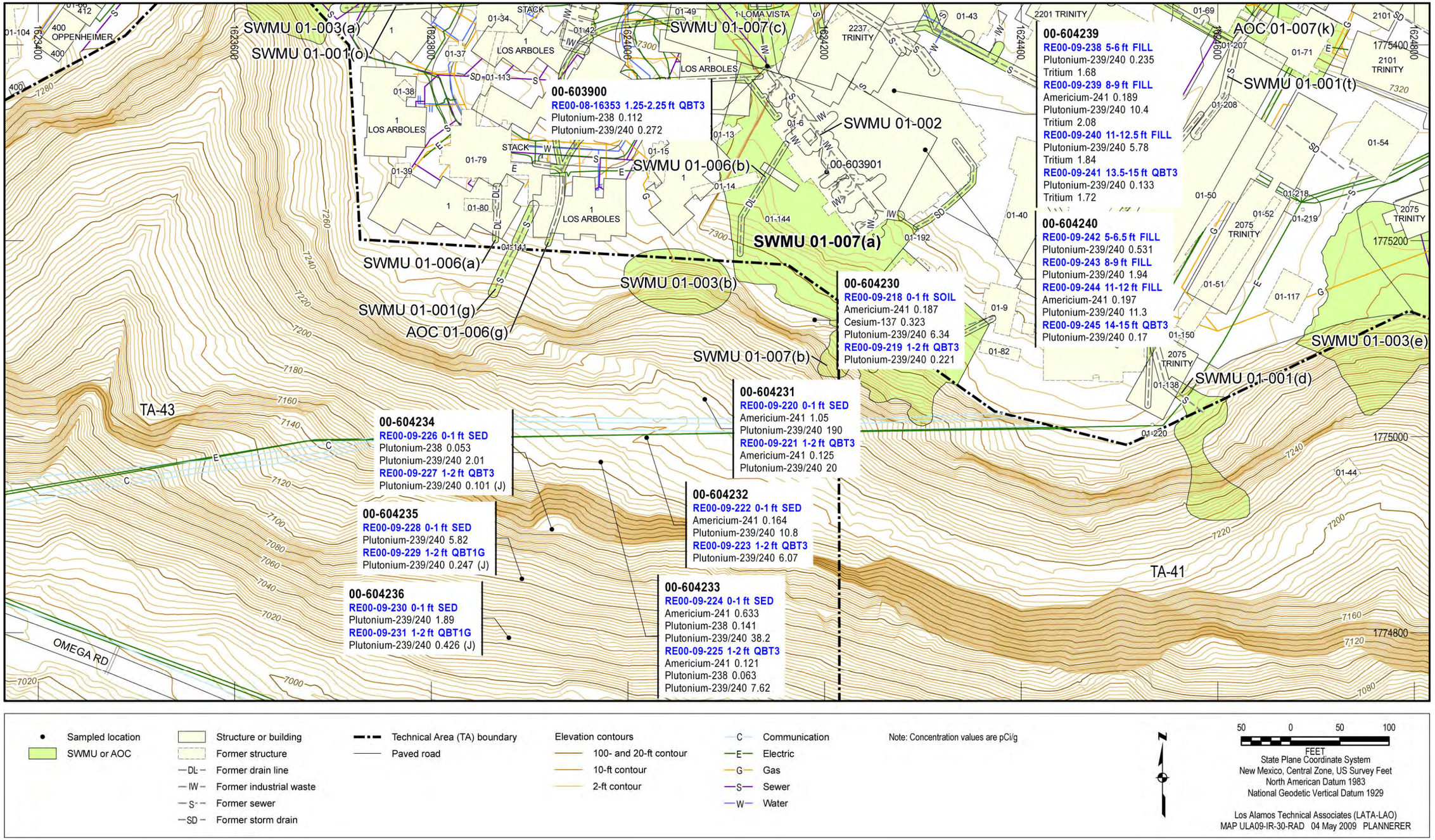


Figure 6.28-4 Radionuclide COPCs detected or detected above BVs/FVs at SWMU 01-007(a)

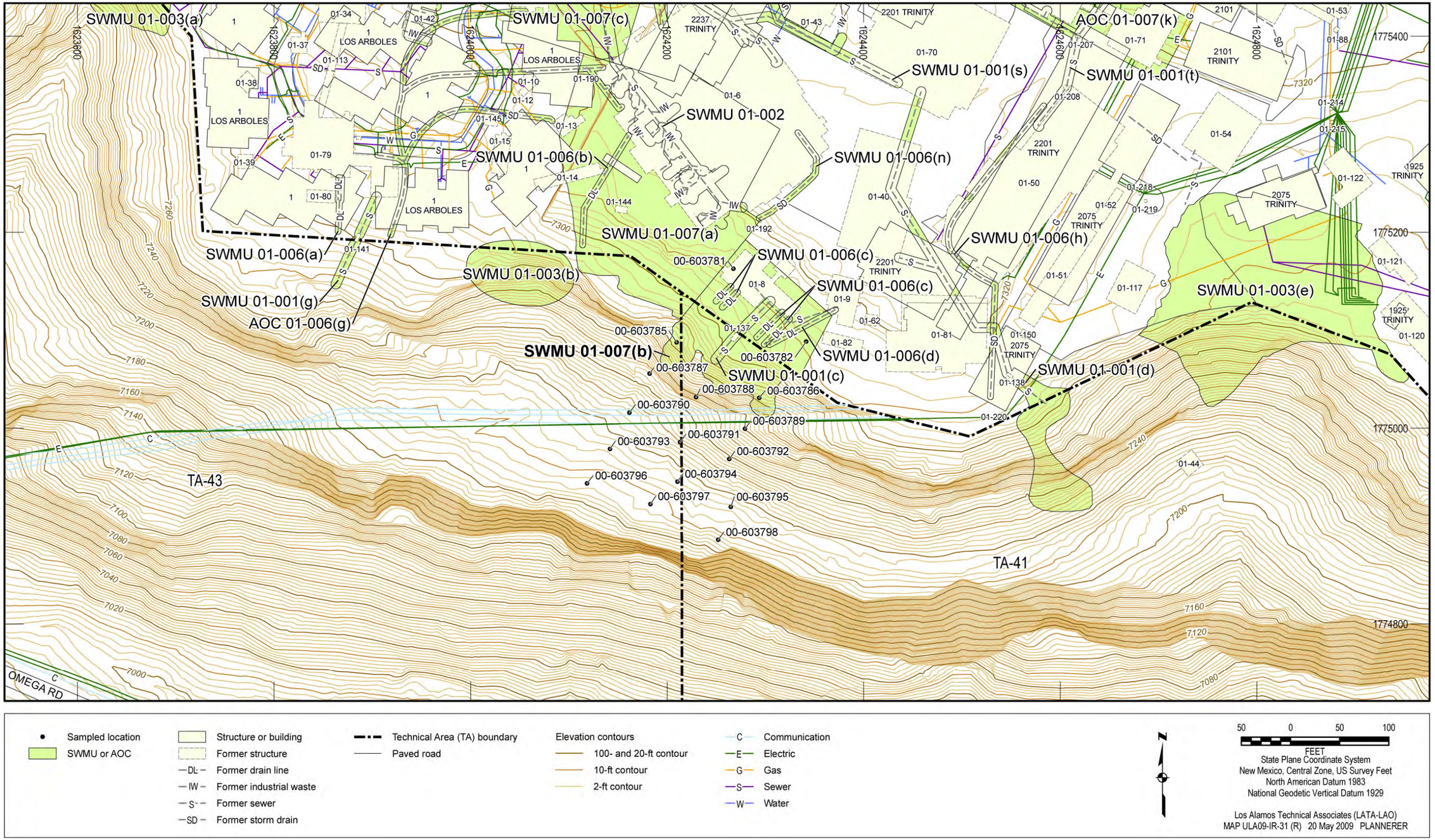


Figure 6.29-1 SWMU 01-007(b) site map and sampling locations

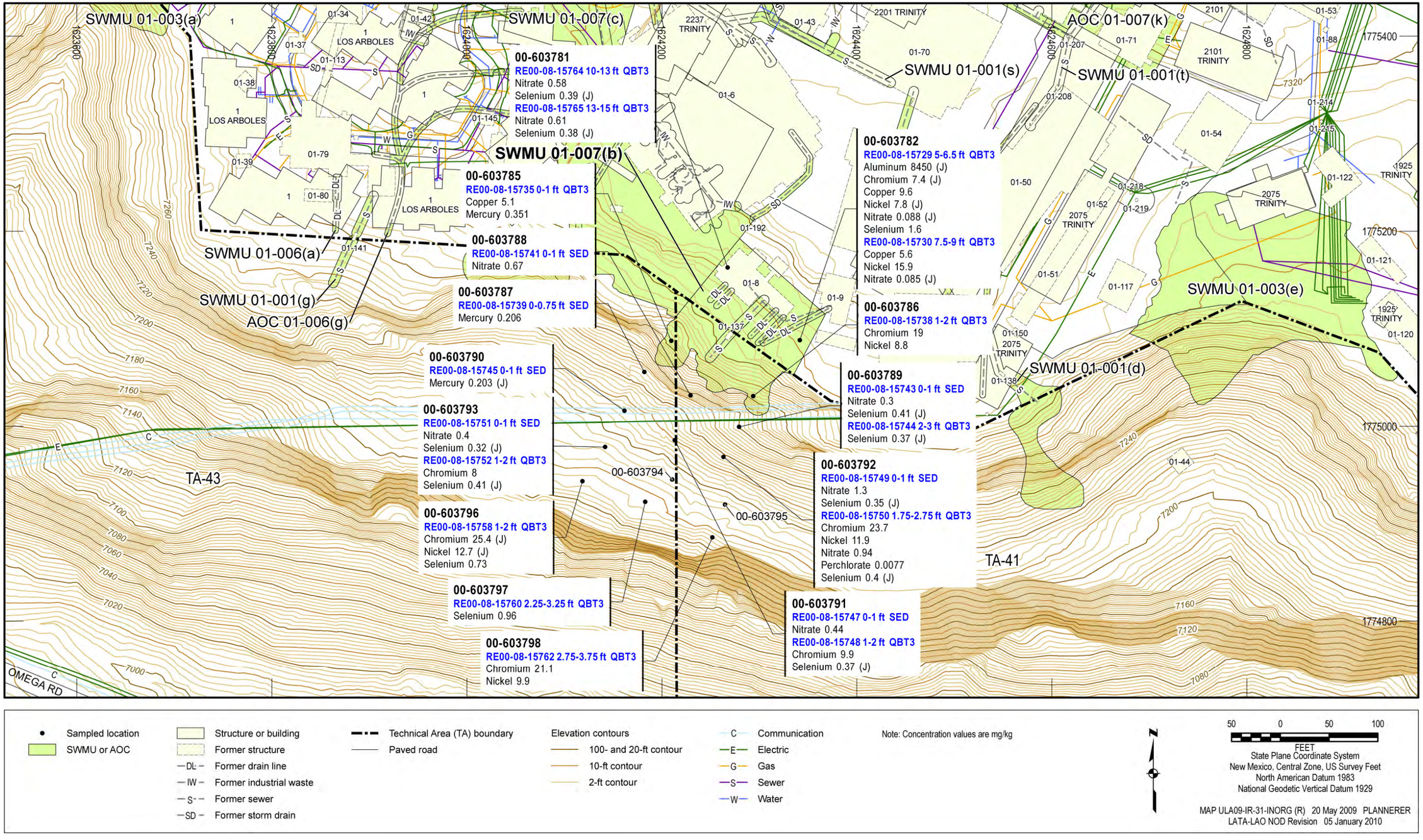


Figure 6.29-2 Inorganic COPCs detected or detected above BVs at SWMU 01-007(b)

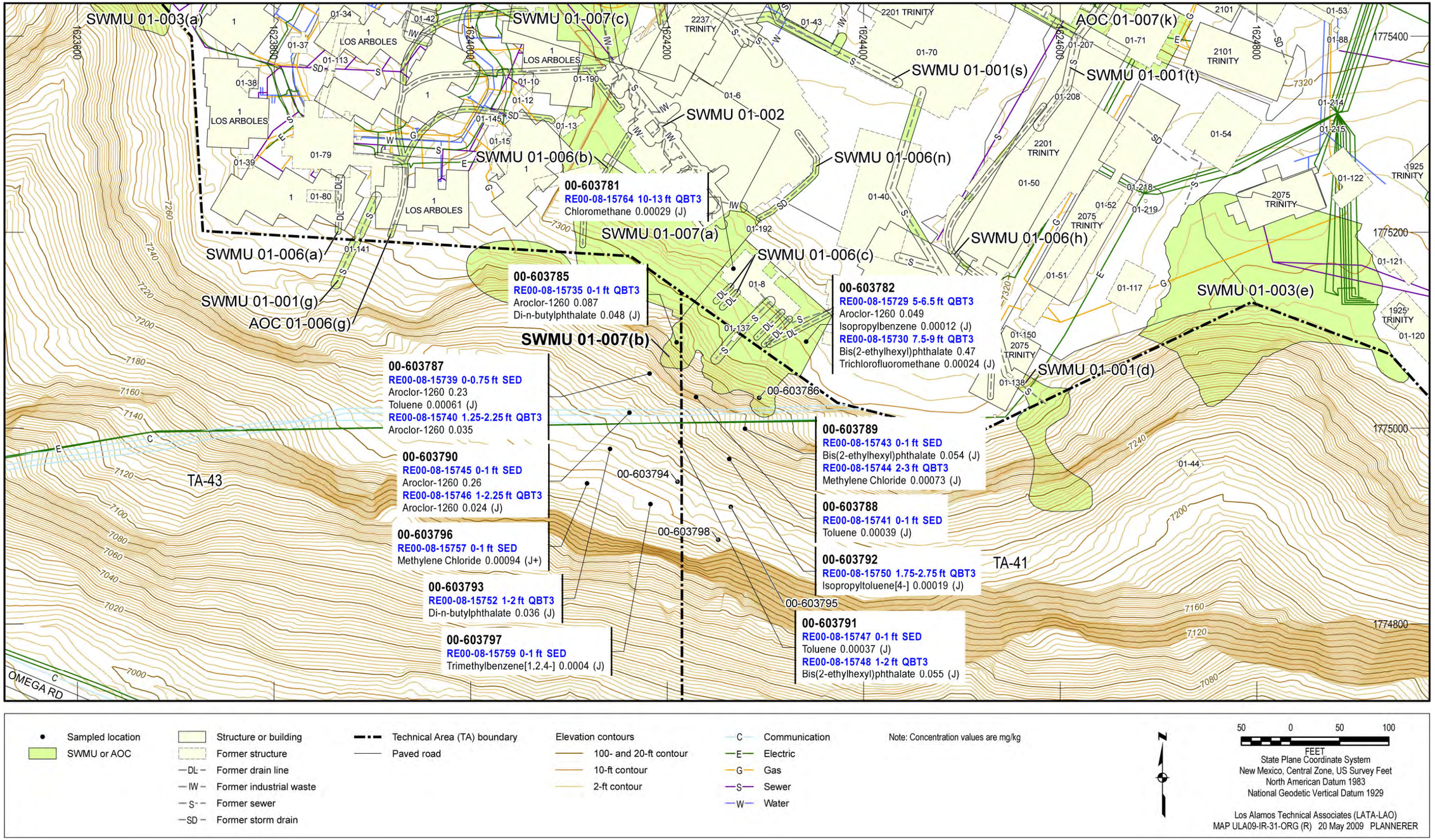


Figure 6.29-3 Organic COPCs detected at SWMU 01-007(b)

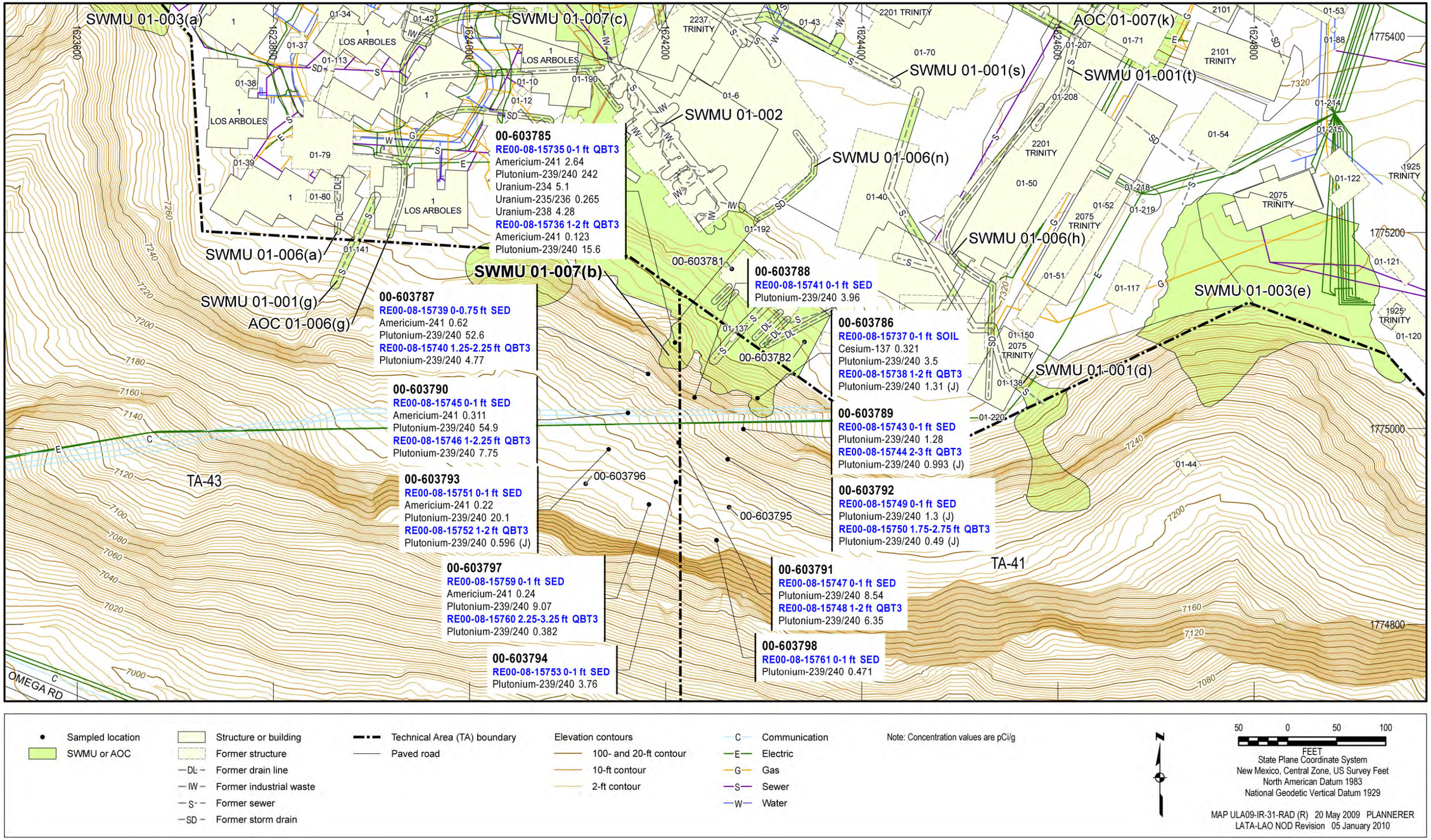


Figure 6.29-4 Radionuclide COPCs detected or detected above BVs/FVs at SWMU 01-007(b)

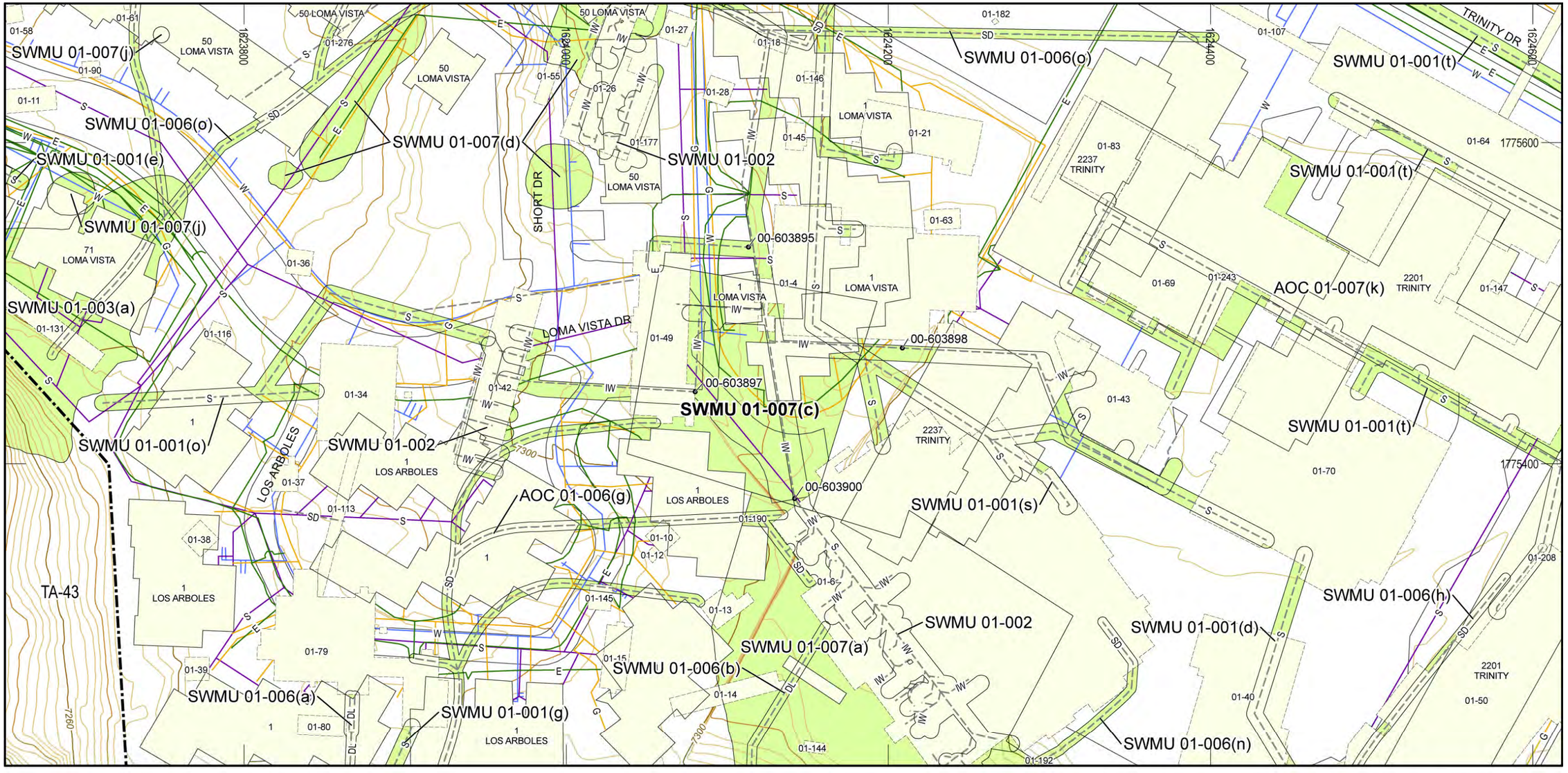


Figure 6.30-1 SWMU 01-007(c) site map and sampling locations

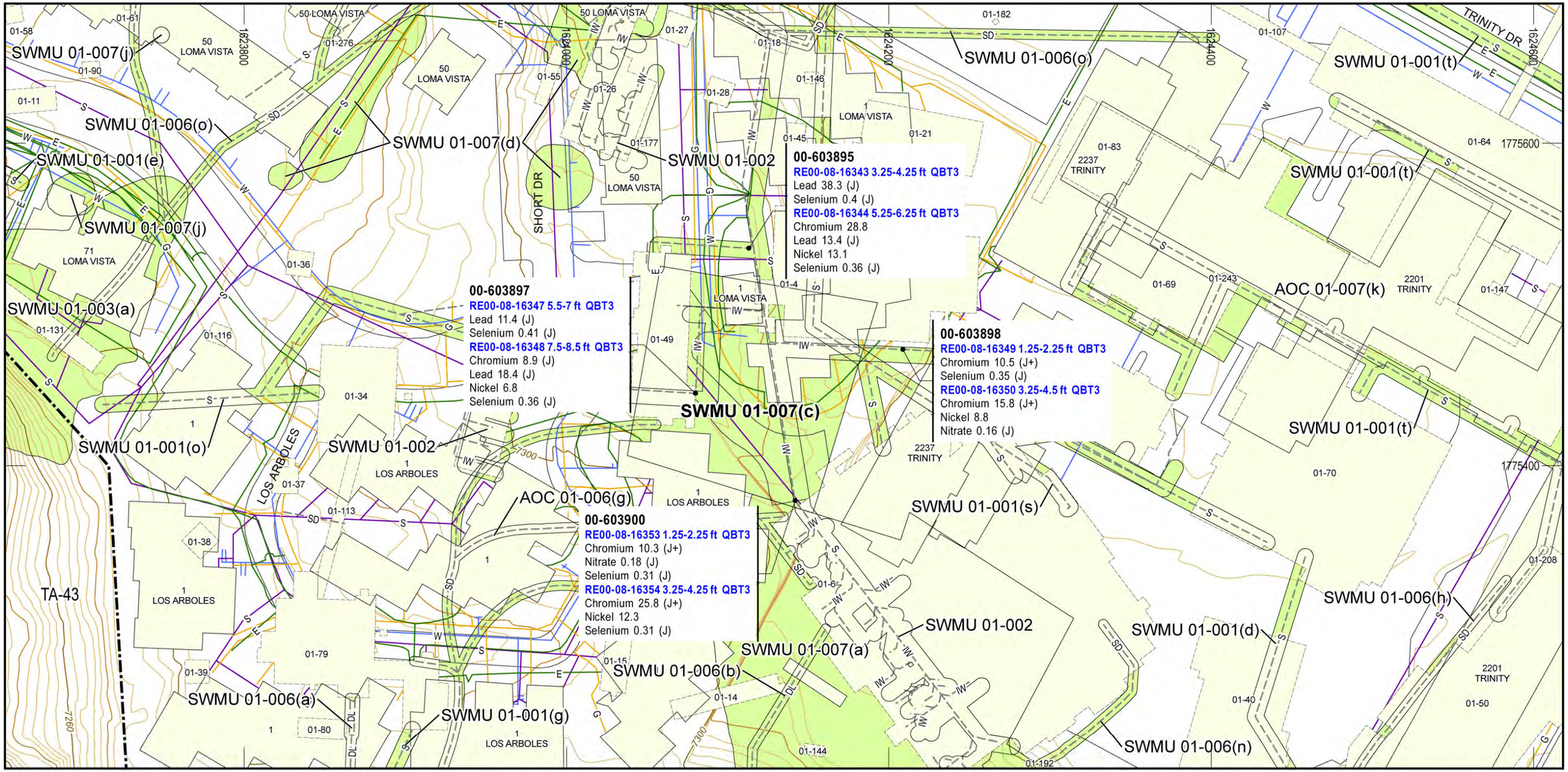
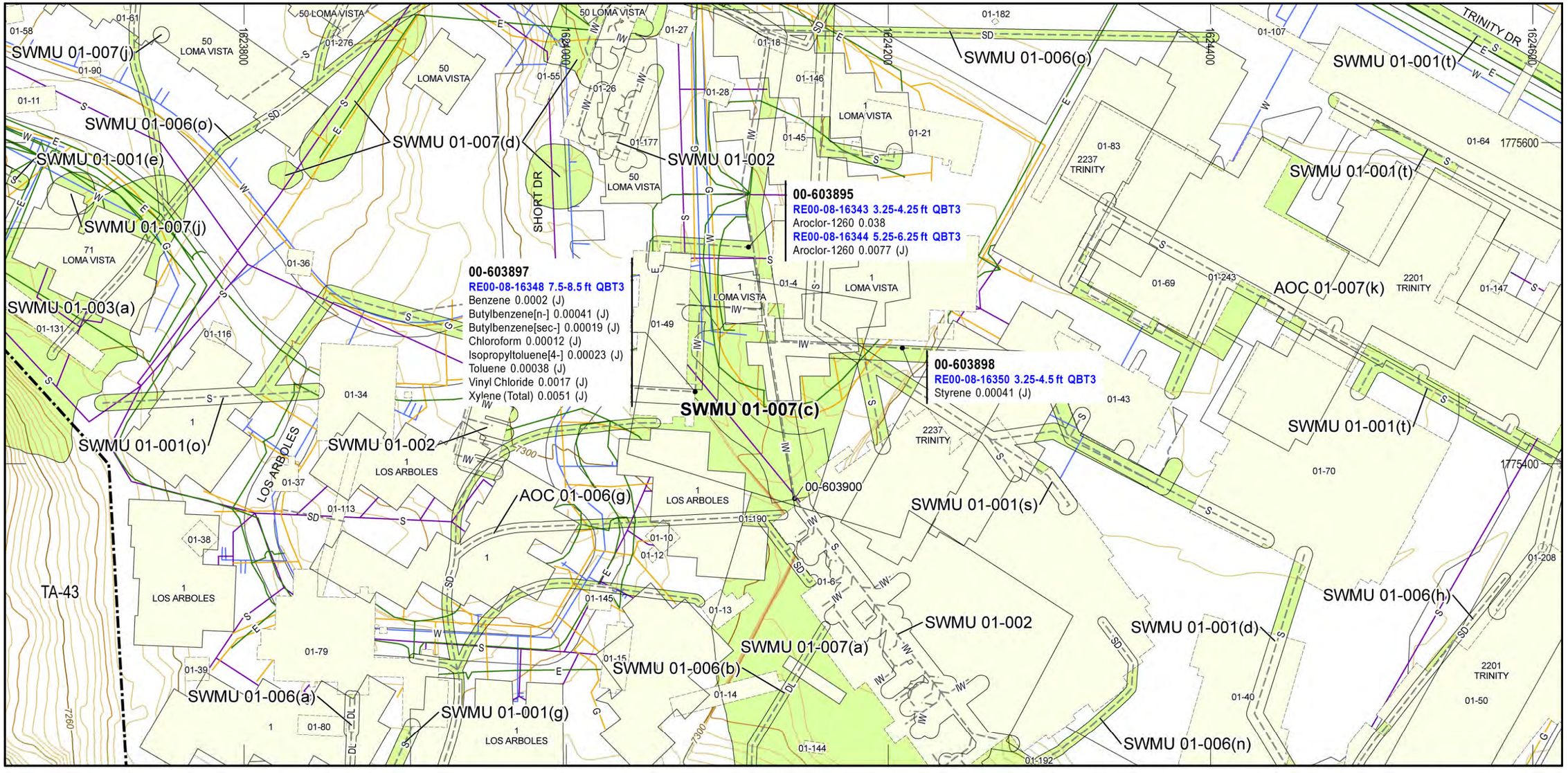


Figure 6.30-2 Inorganic COPCs detected or detected above BVs at SWMU 01-007(c)



Sampled location
SWMU or AOC
Structure or building
Former structure
Former drain line
Former industrial waste
Former sewer
Former storm drain
Technical Area (TA) boundary
Paved road
Elevation contours
100- and 20-ft contour
10-ft contour
2-ft contour
Electric
Gas
Sewer
Water

Note: Concentration values are mg/kg

25 0 25 50 75
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 ULA09-IR-32-ORG 05 May 2009 PLANNERER

Figure 6.30-3 Organic COPCs detected at SWMU 01-007(c)

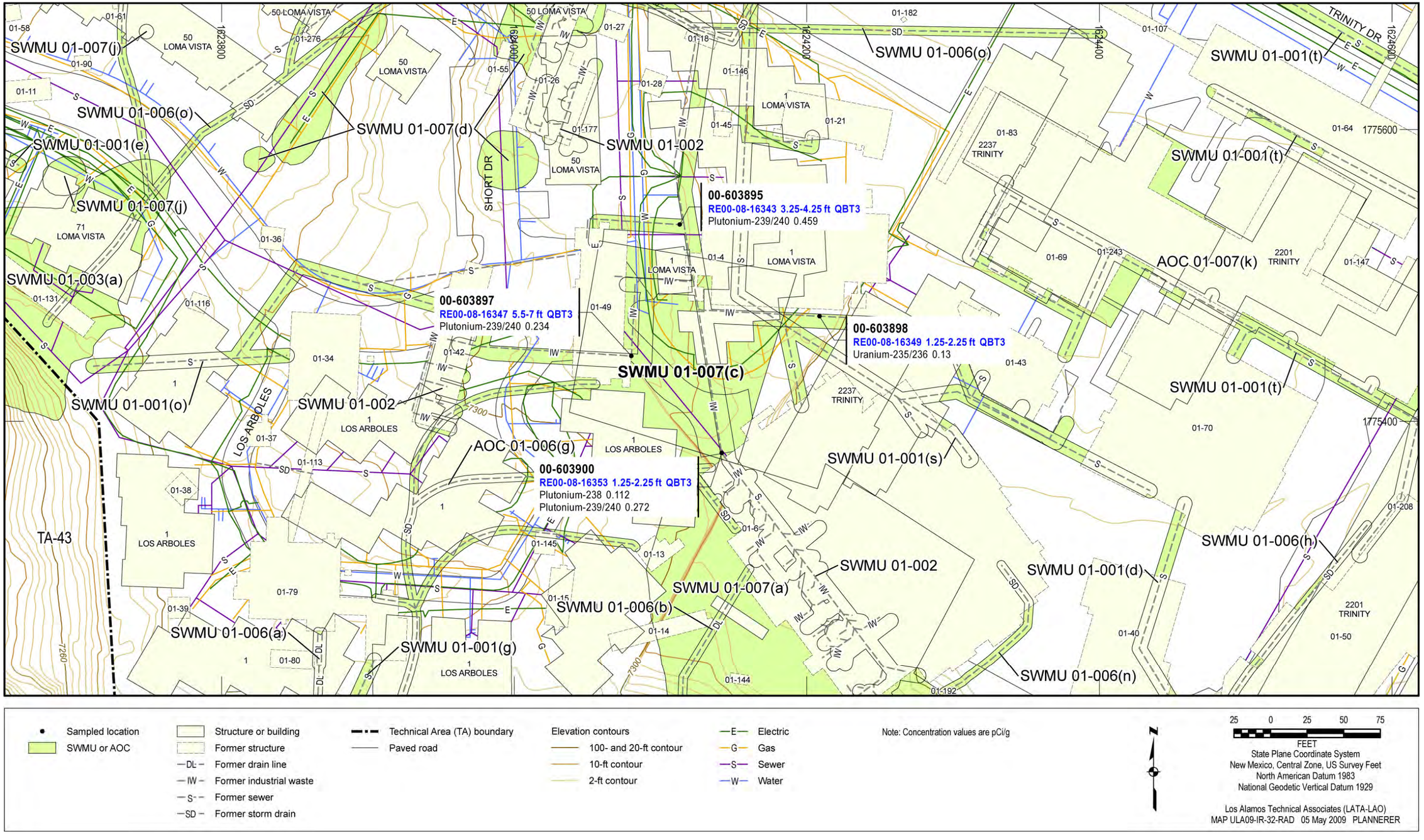


Figure 6.30-4 Radionuclide COPCs detected or detected above BVs/FVs at SWMU 01-007(c)

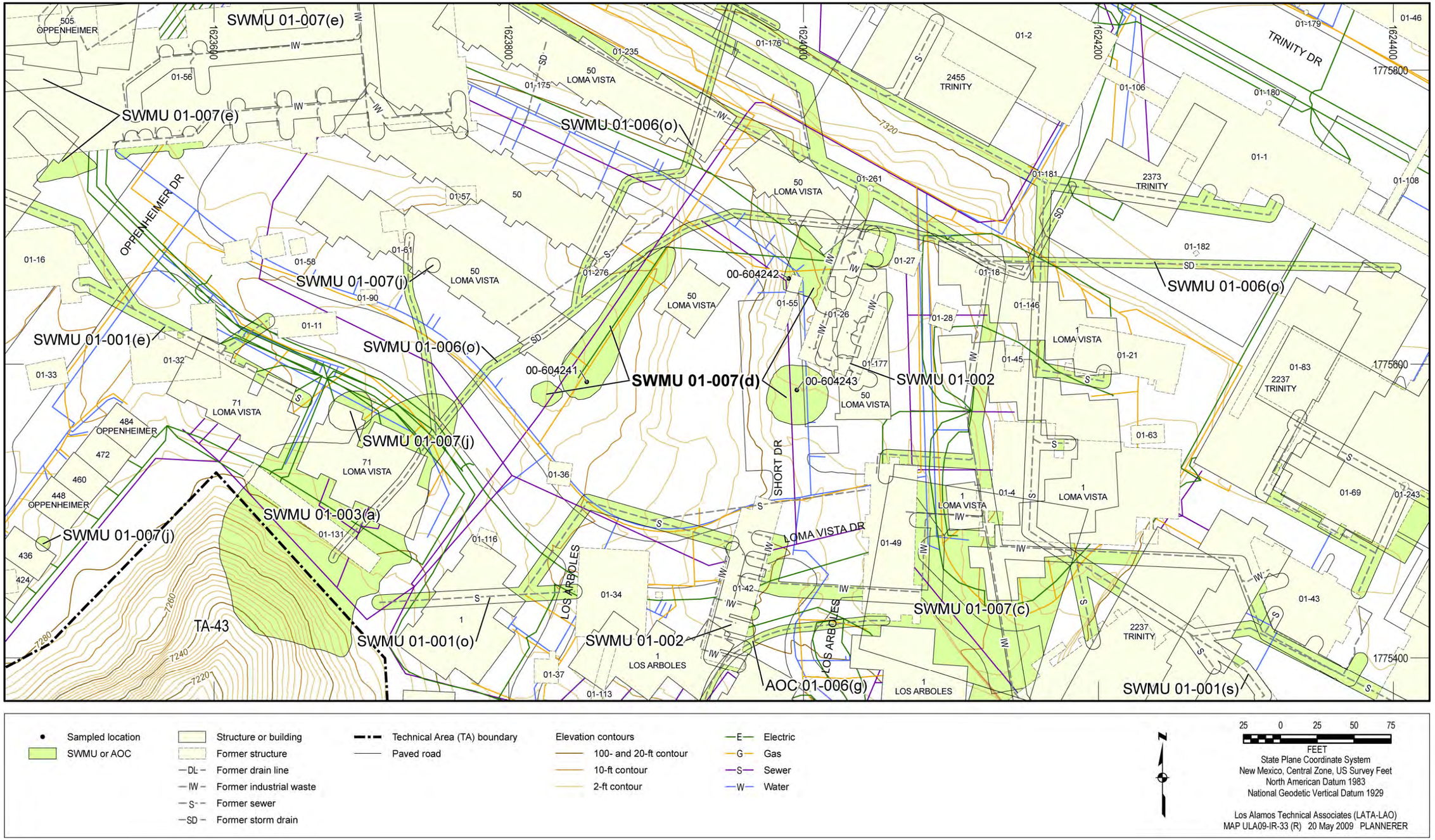


Figure 6.31-1 SWMU 01-007(d) site map and sampling locations

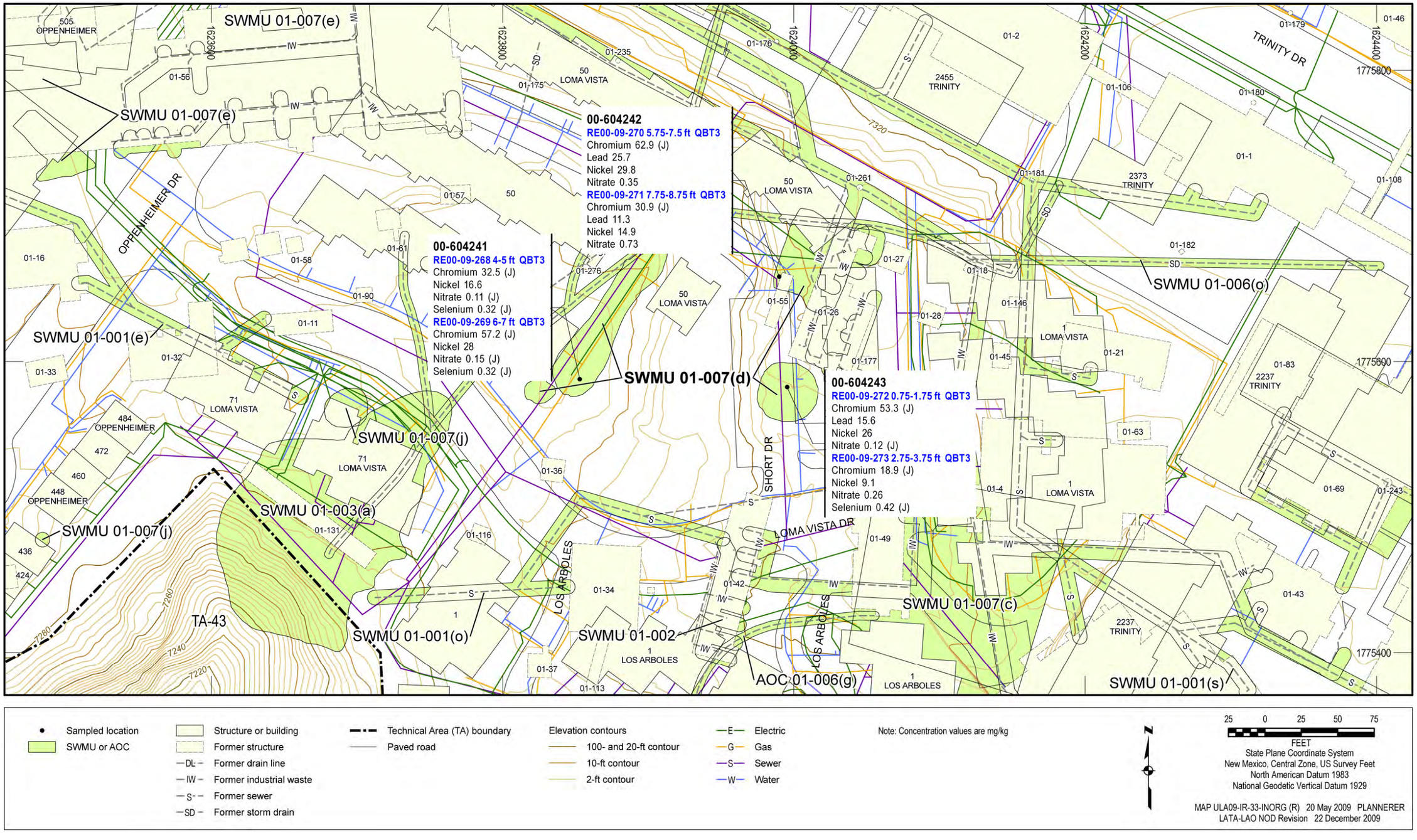


Figure 6.31-2 Inorganic COPCs detected or detected above BVs at SWMU 01-007(d)

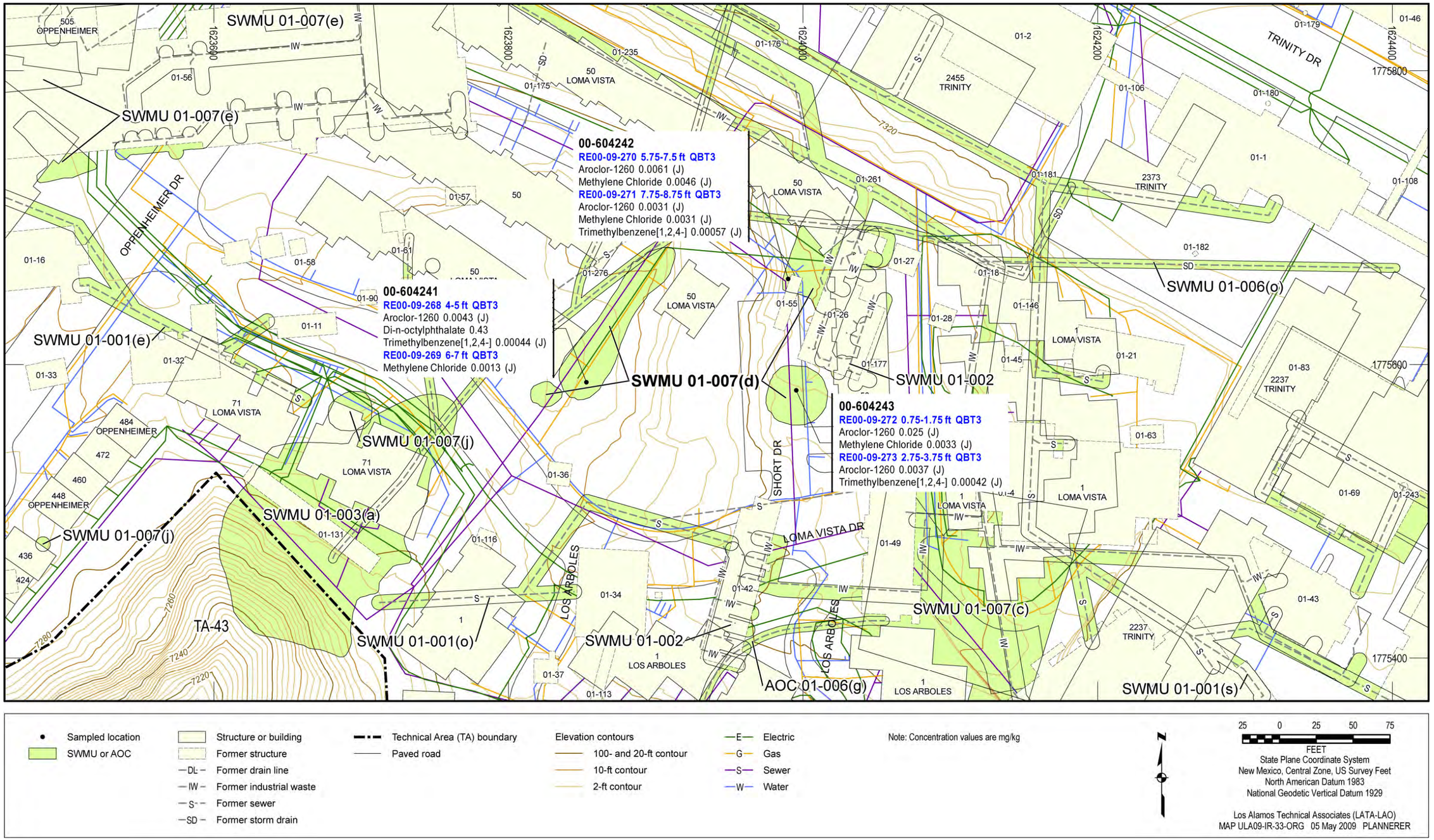


Figure 6.31-3 Organic COPCs detected at SWMU 01-007(d)

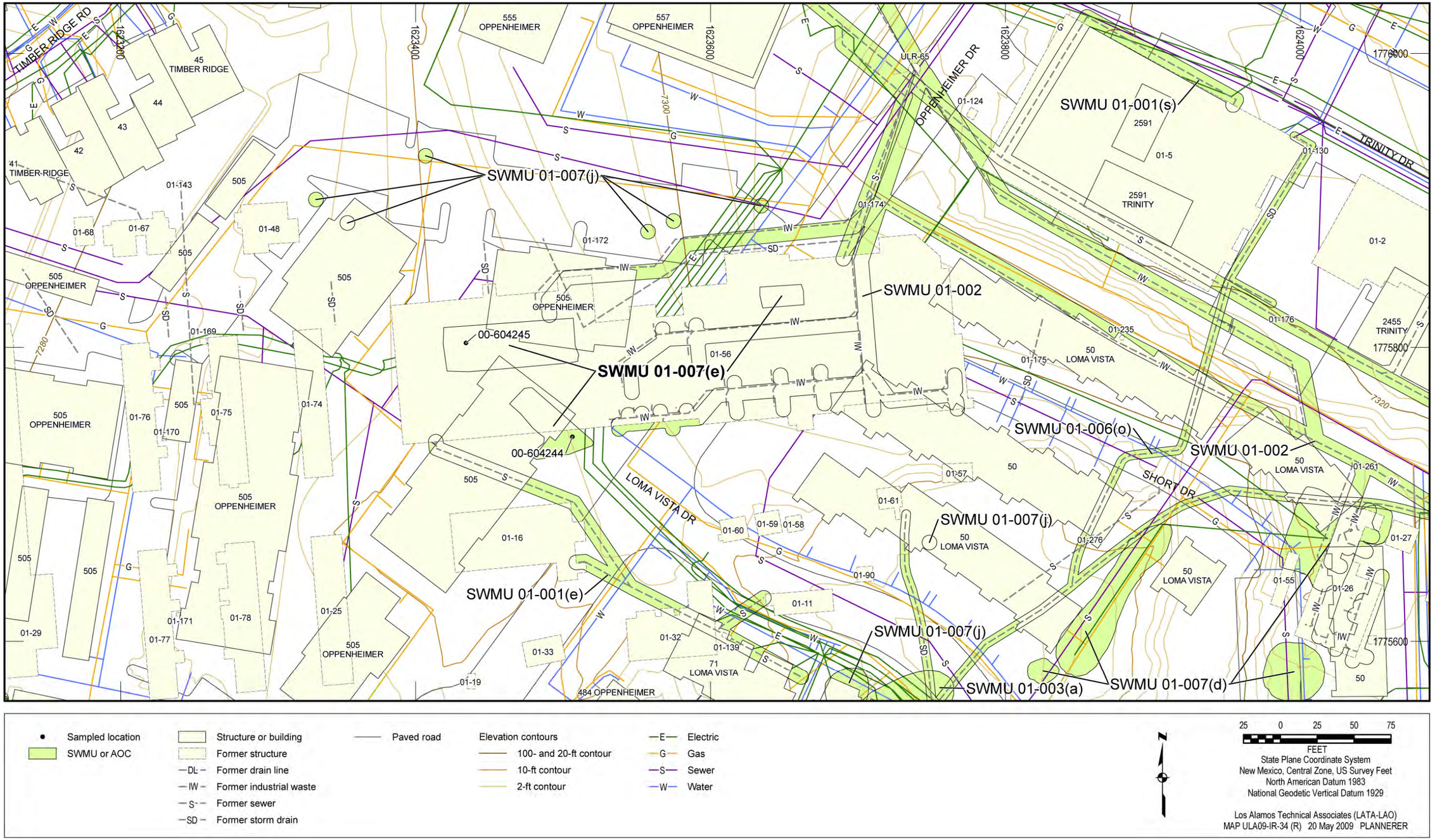


Figure 6.32-1 SWMU 01-007(e) site map and sampling locations

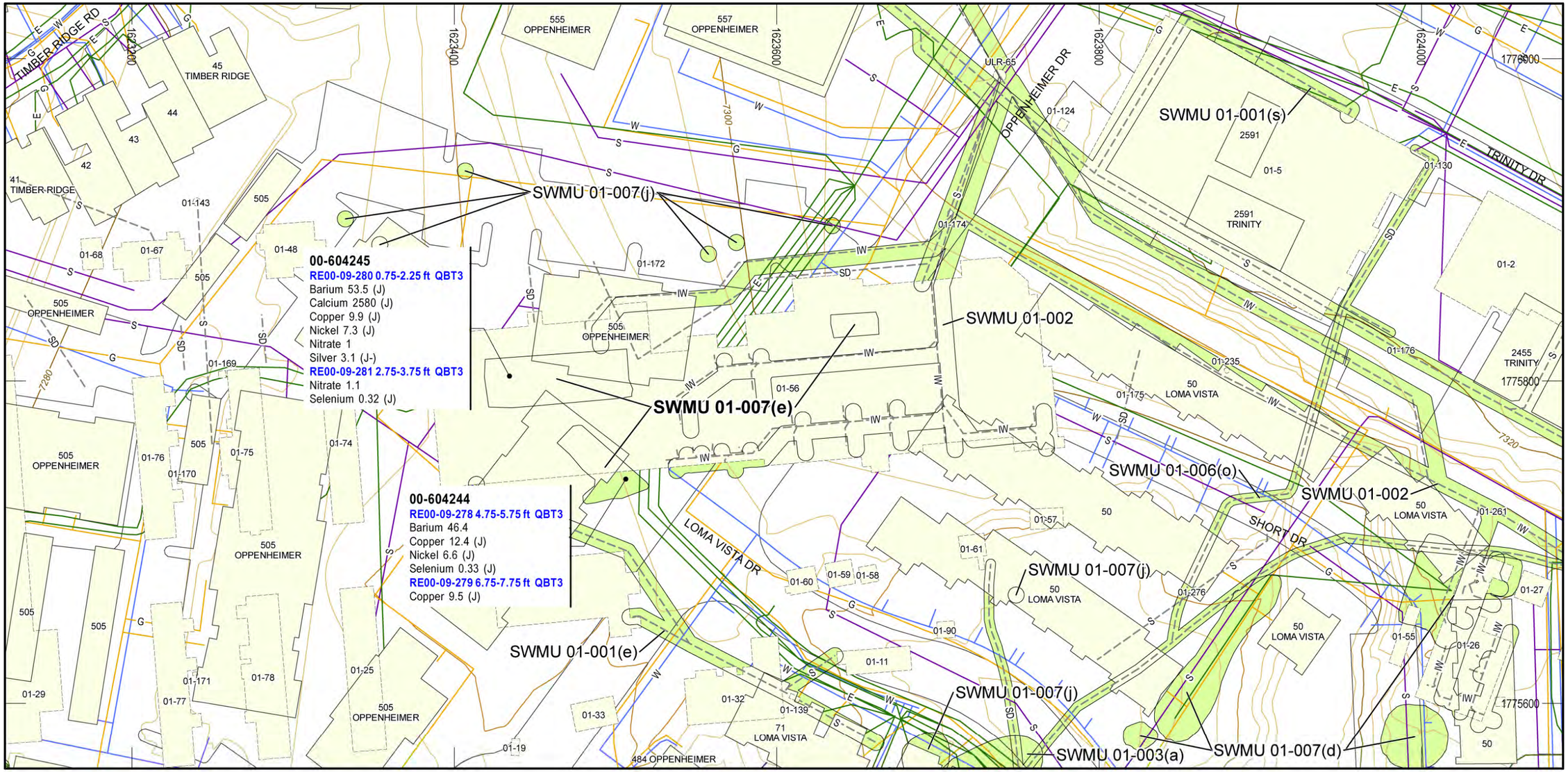


Figure 6.32-2 Inorganic COPCs detected or detected above BVs at SWMU 01-007(e)

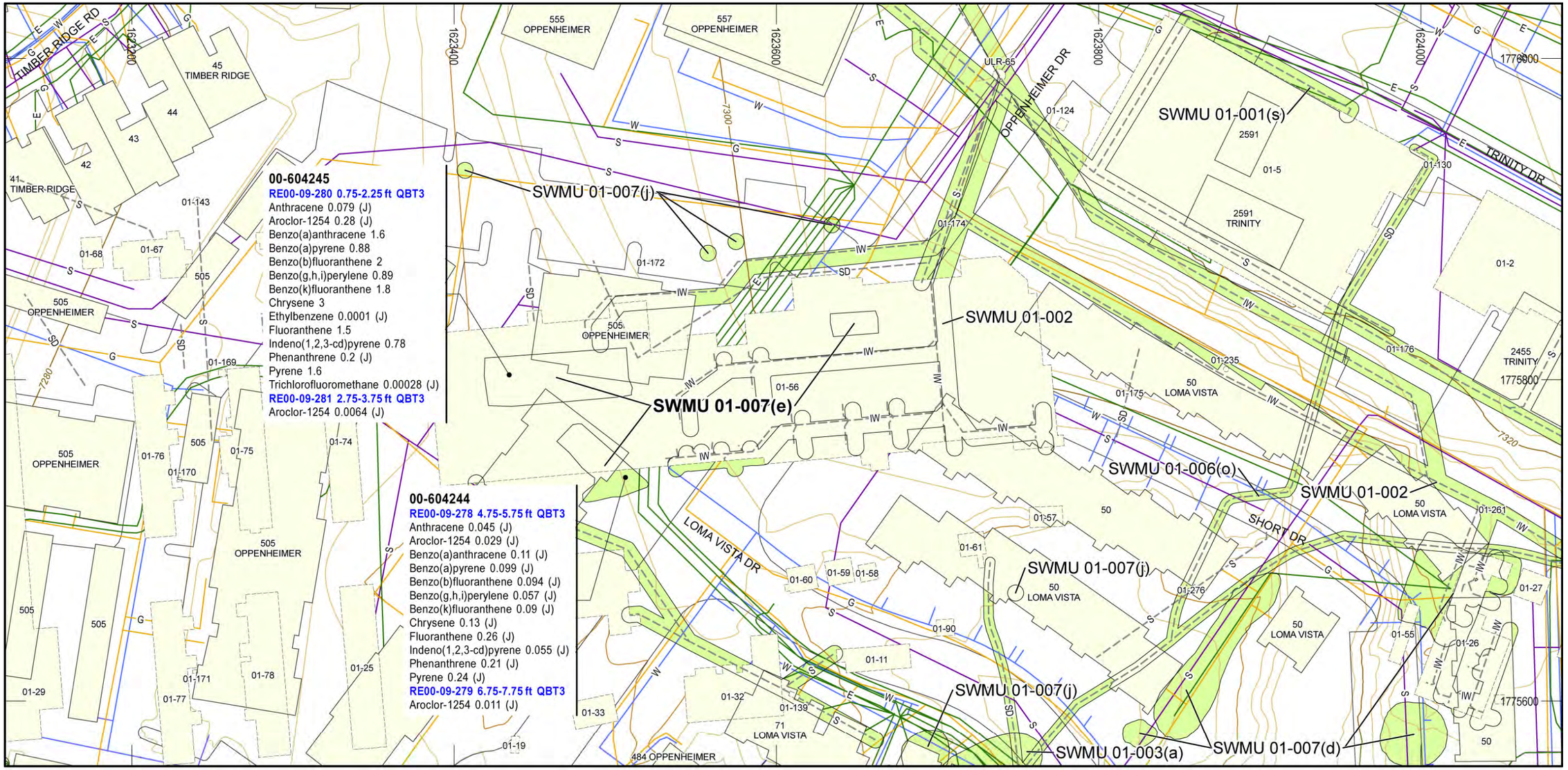


Figure 6.32-3 Organic COPCs detected at SWMU 01-007(e)

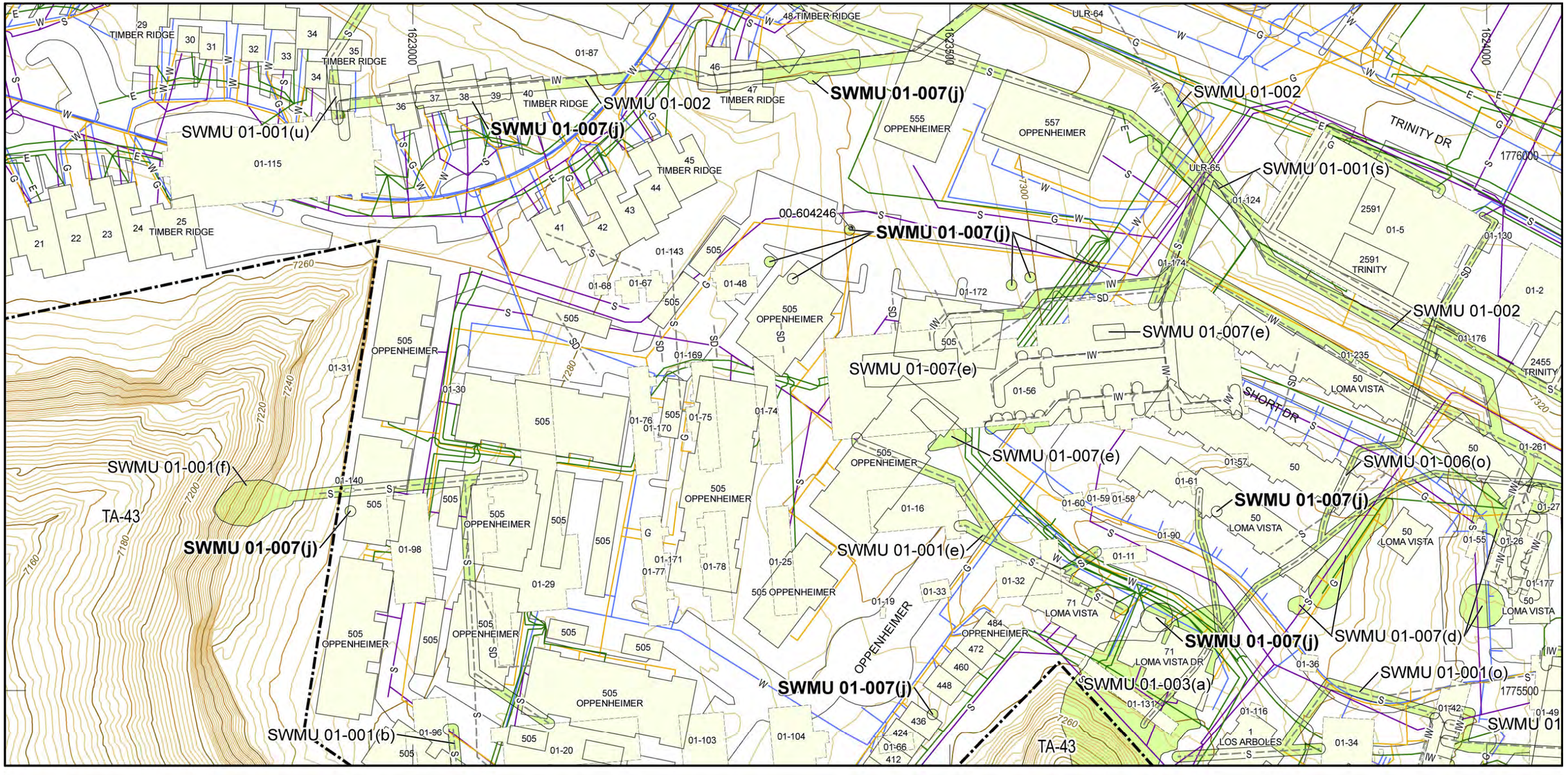


Figure 6.33-1 SWMU 01-007(j) site map and sampling locations

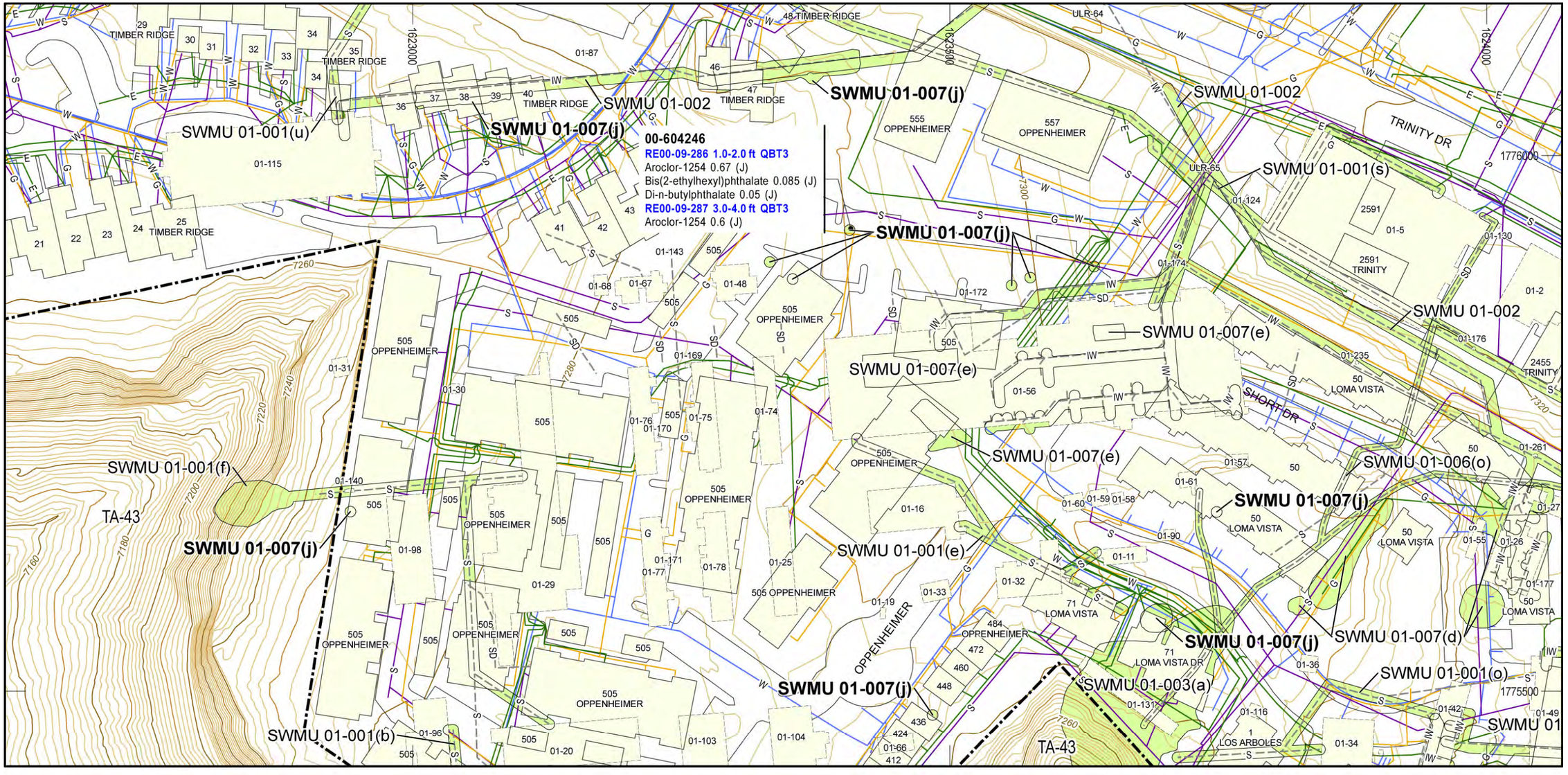


Figure 6.33-2 Organic COPCs detected at SWMU 01-007(j)

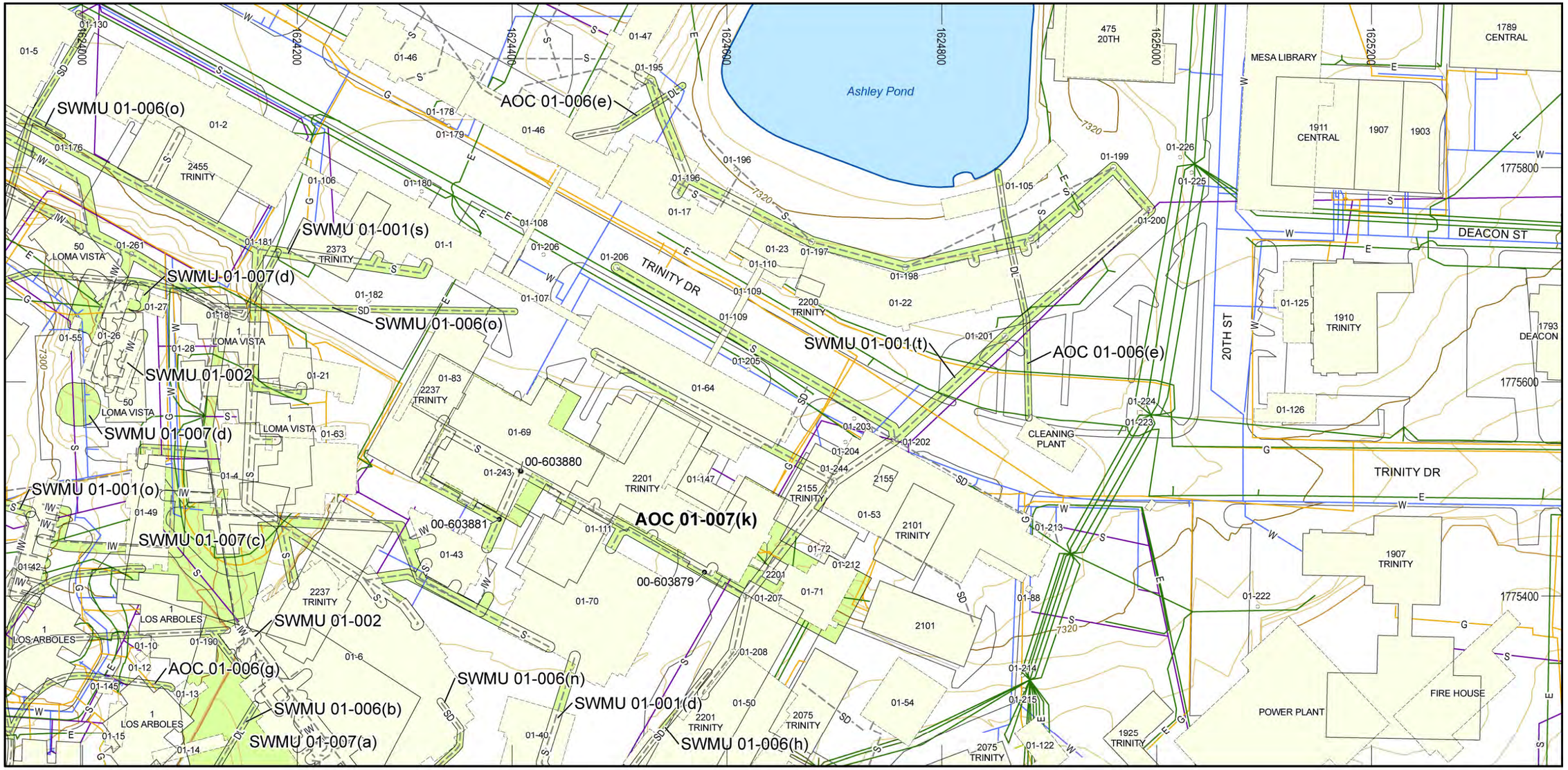


Figure 6.34-1 AOC 01-007(k) site map and sampling locations

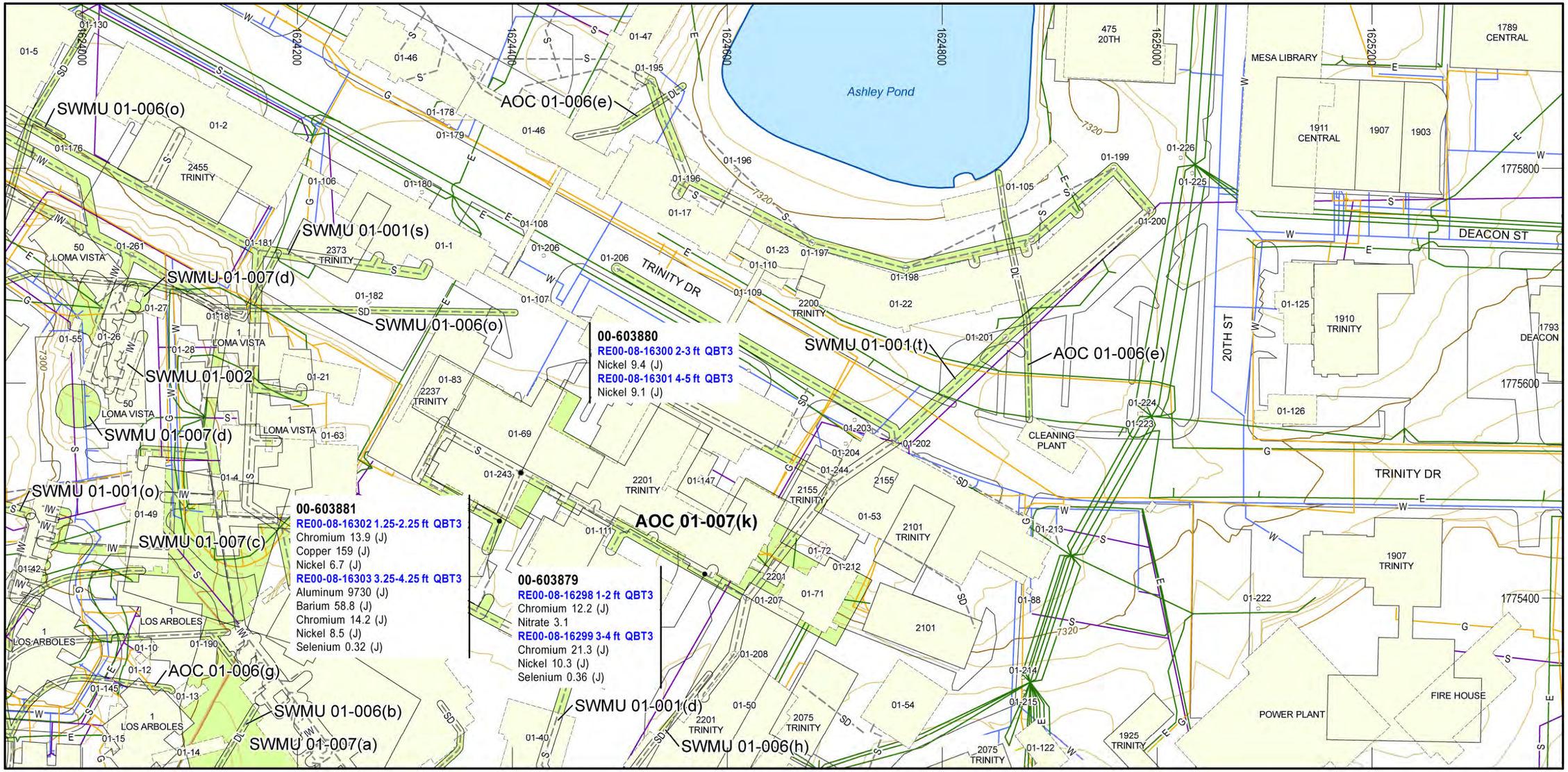


Figure 6.34-2 Inorganic COPCs detected or detected above BVs at AOC 01-007(k)

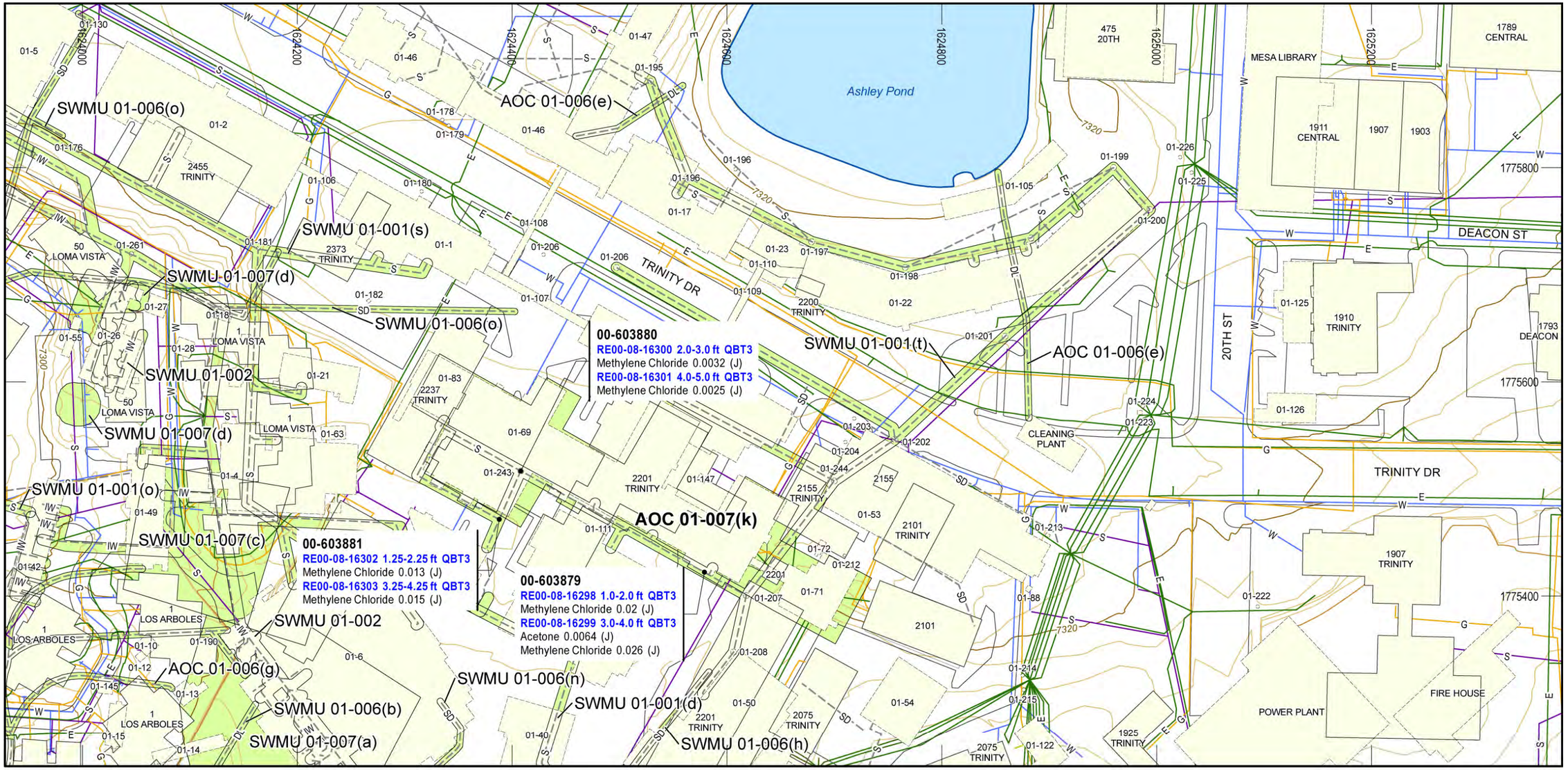


Figure 6.34-3 Organic COPCs detected at AOC 01-007(k)

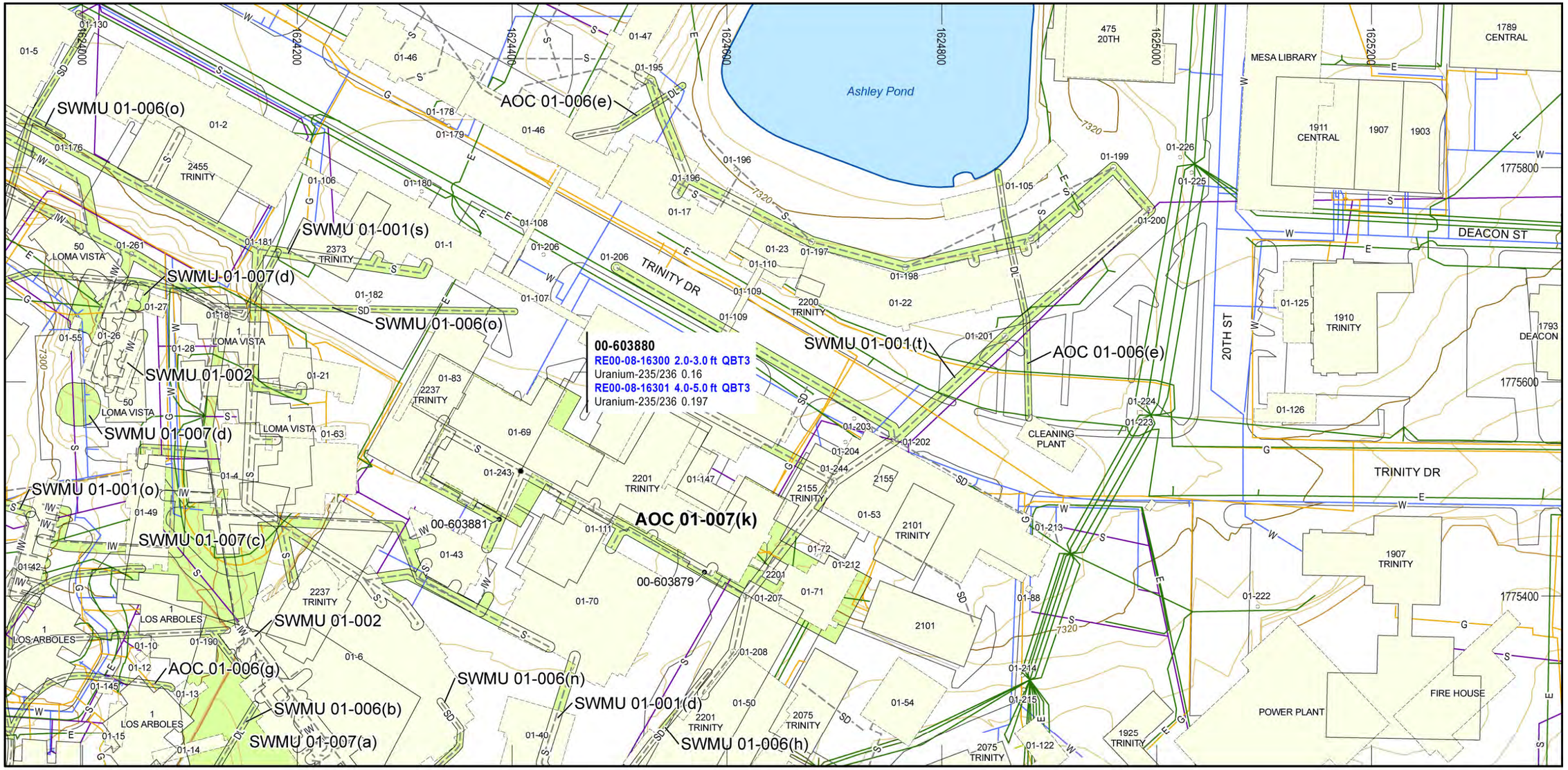


Figure 6.34-4 Radionuclide COPCs detected or detected above BVs/FVs at AOC 01-007(k)

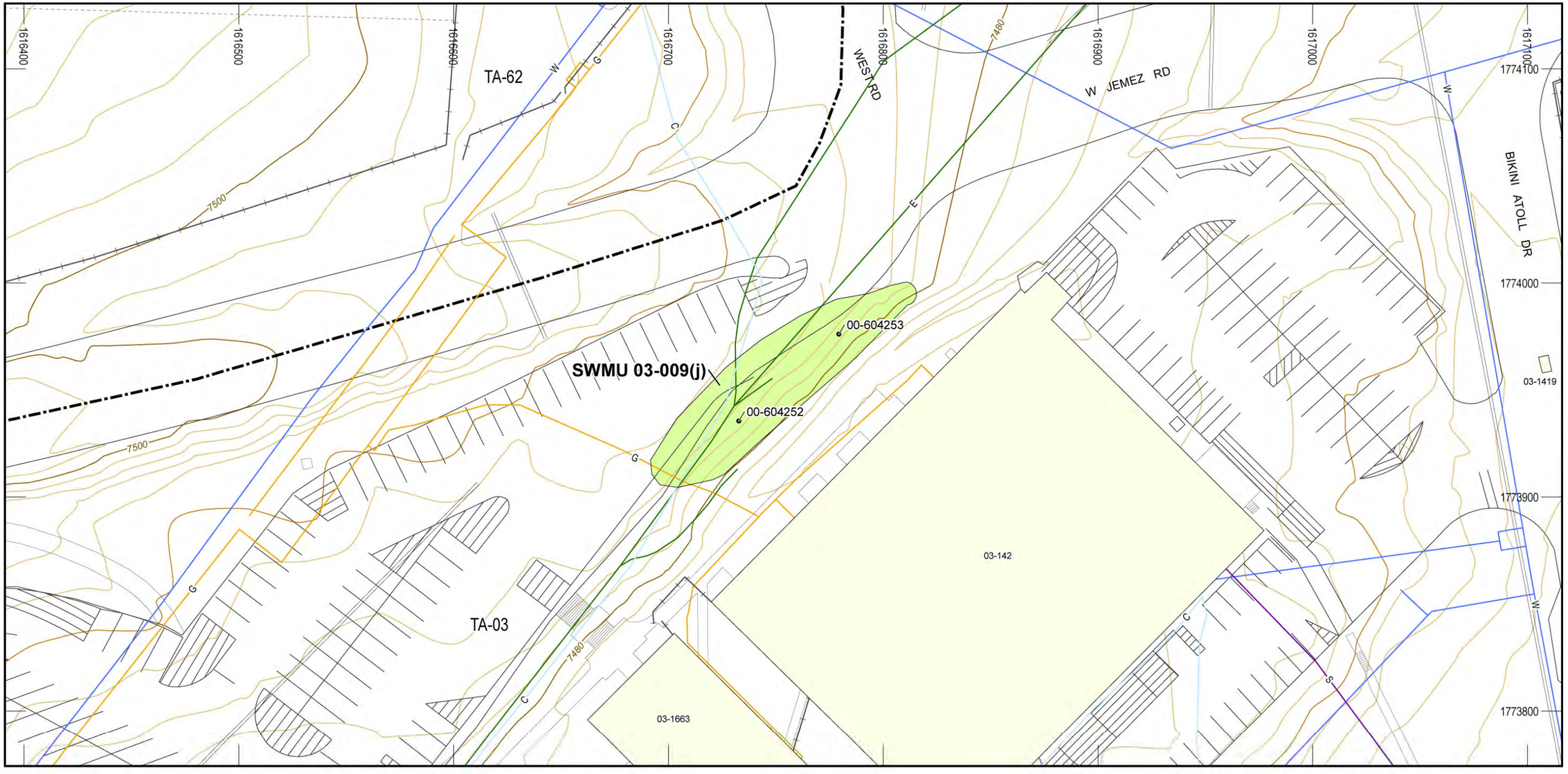


Figure 7.3-1 SWMU 03-009(j) site map and sampling locations

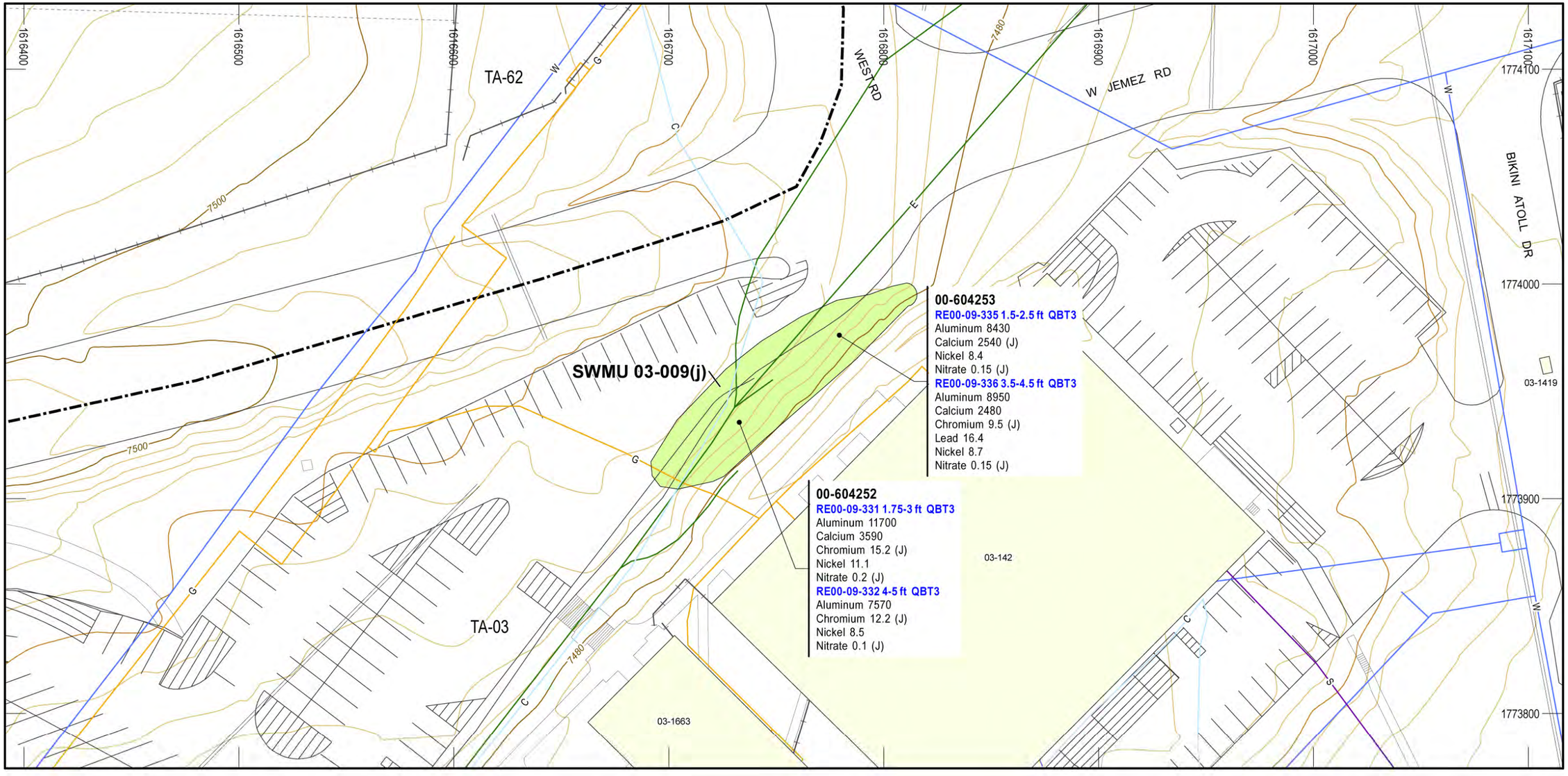


Figure 7.3-2 Inorganic COPCs detected or detected above BVs at SWMU 03-009(j)

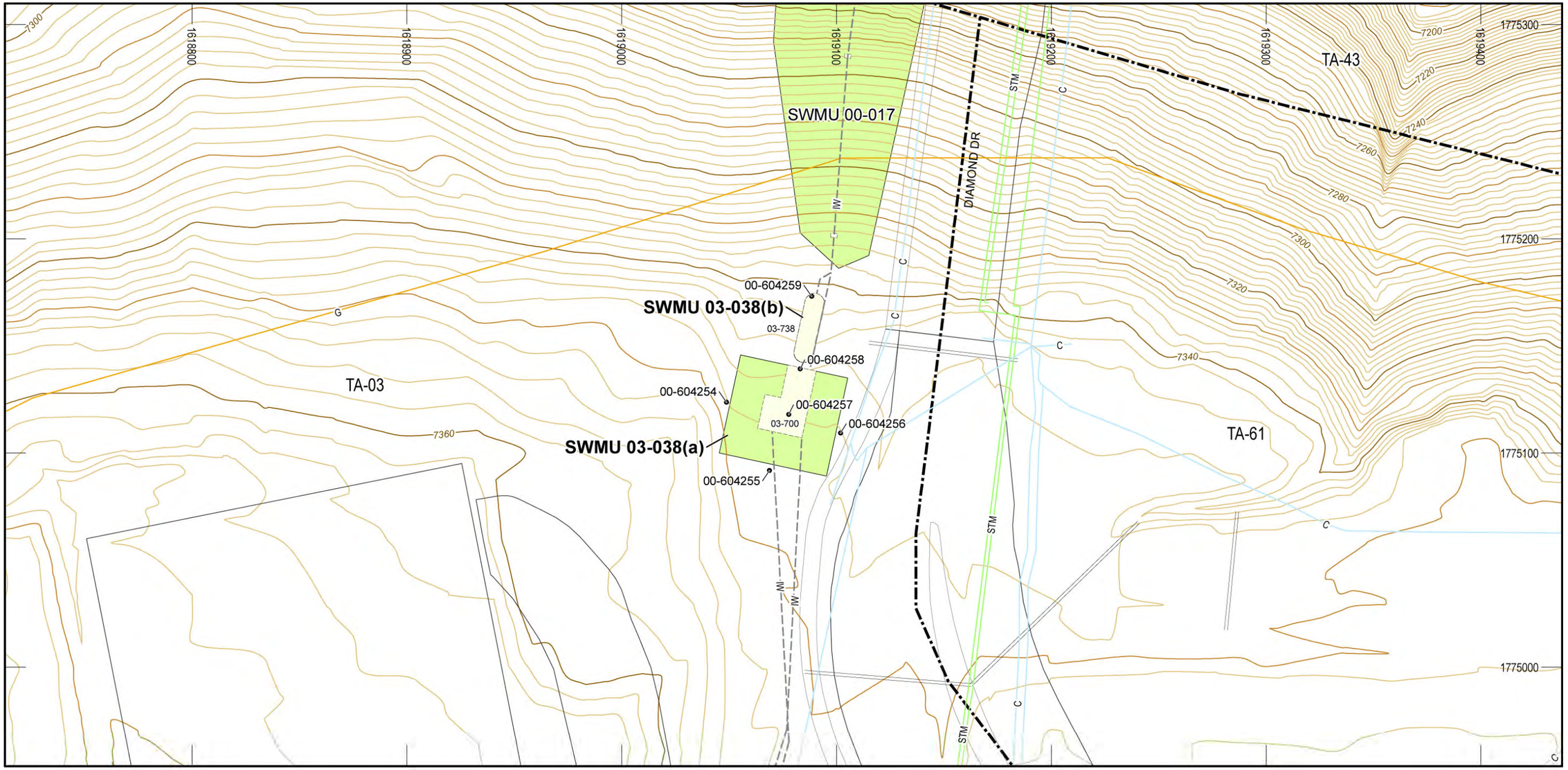


Figure 7.4-1 SWMUs 03-038(a,b) site map and sampling locations

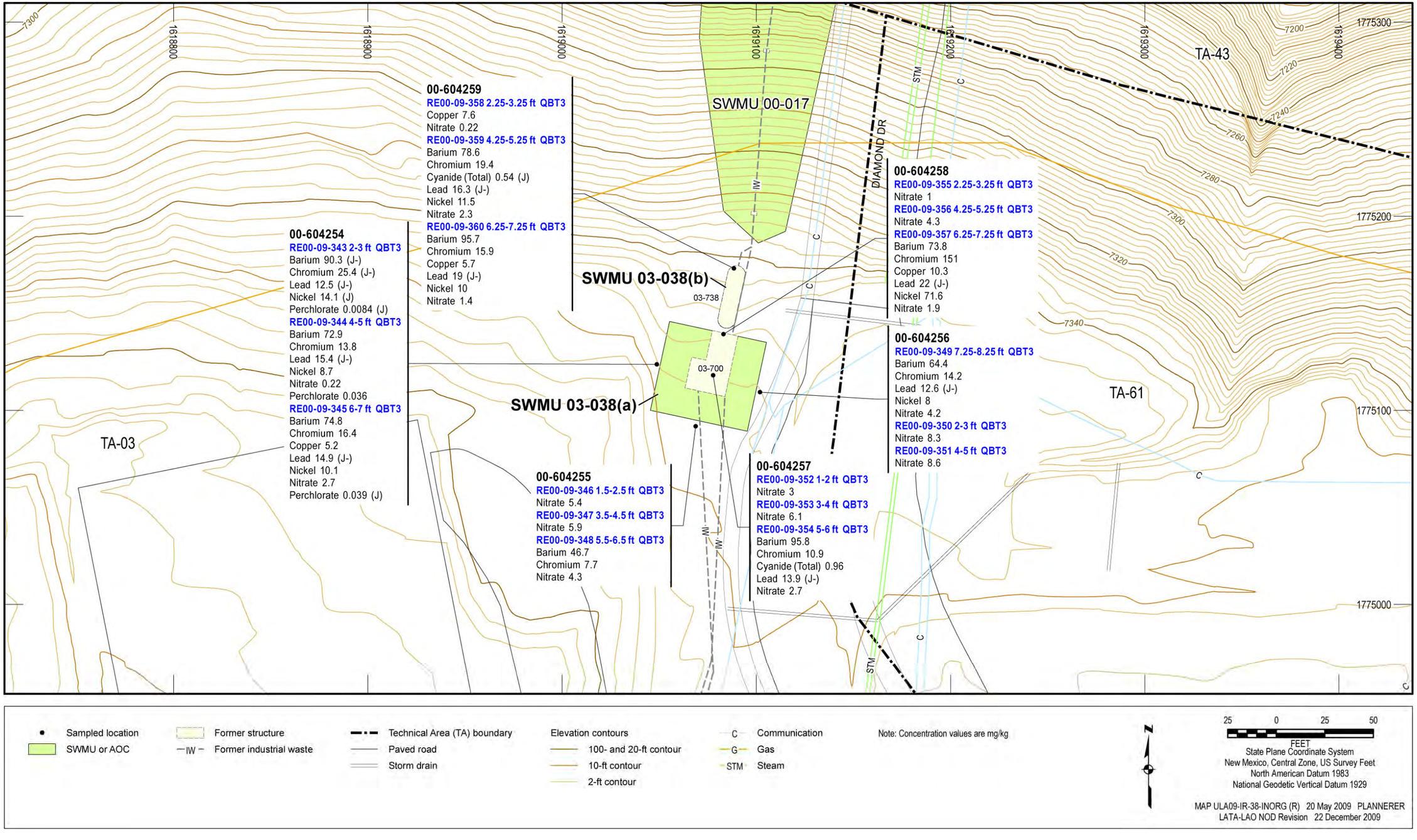


Figure 7.4-2 Inorganic COPCs detected or detected above BVs at SWMUs 03-038(a,b)

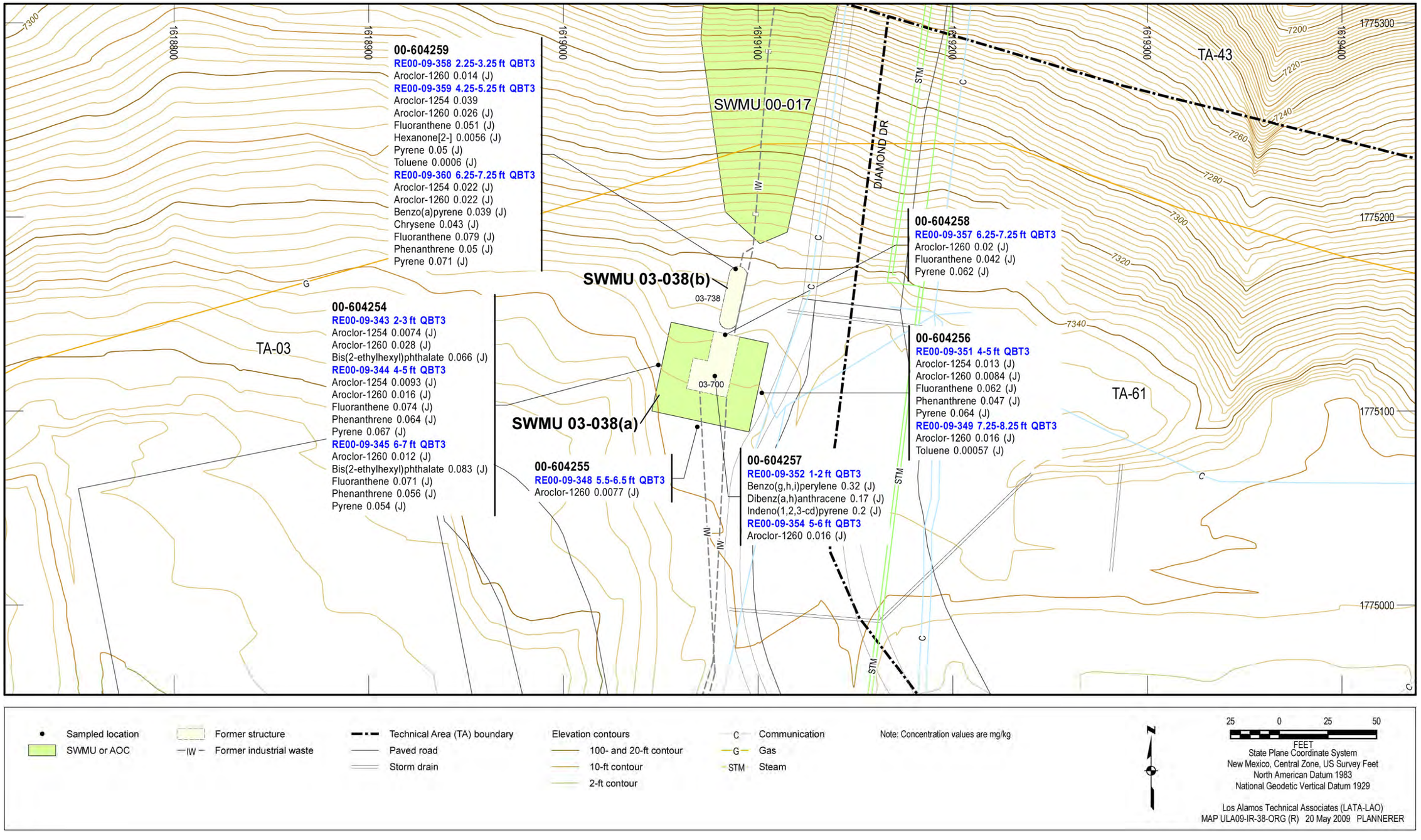


Figure 7.4-3 Organic COPCs detected at SWMUs 03-038(a,b)

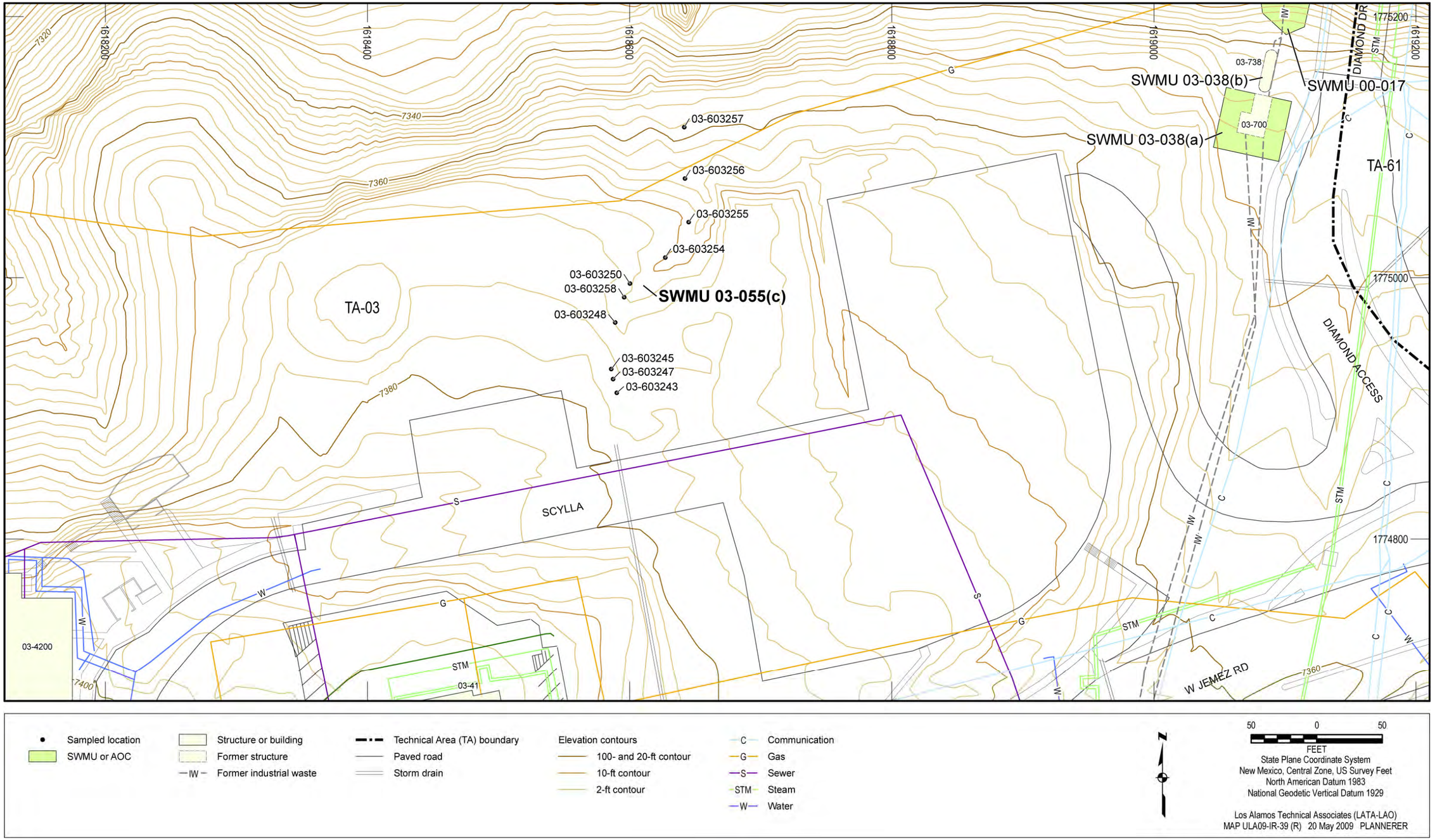


Figure 7.5-1 SWMU 03-055(c) site map and sampling locations

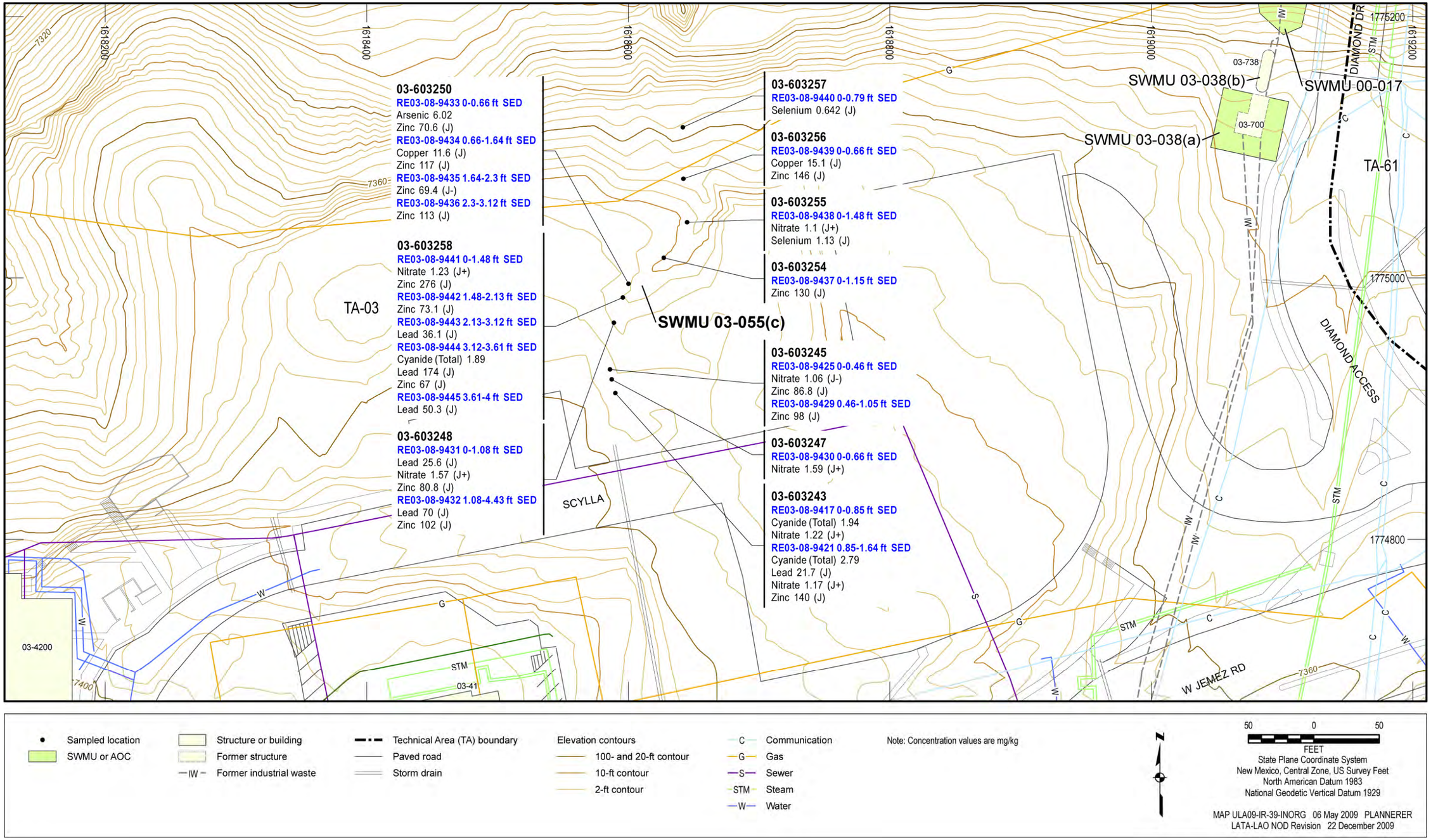


Figure 7.5-2 Inorganic COPCs detected or detected above BVs at SWMU 03-055(c)

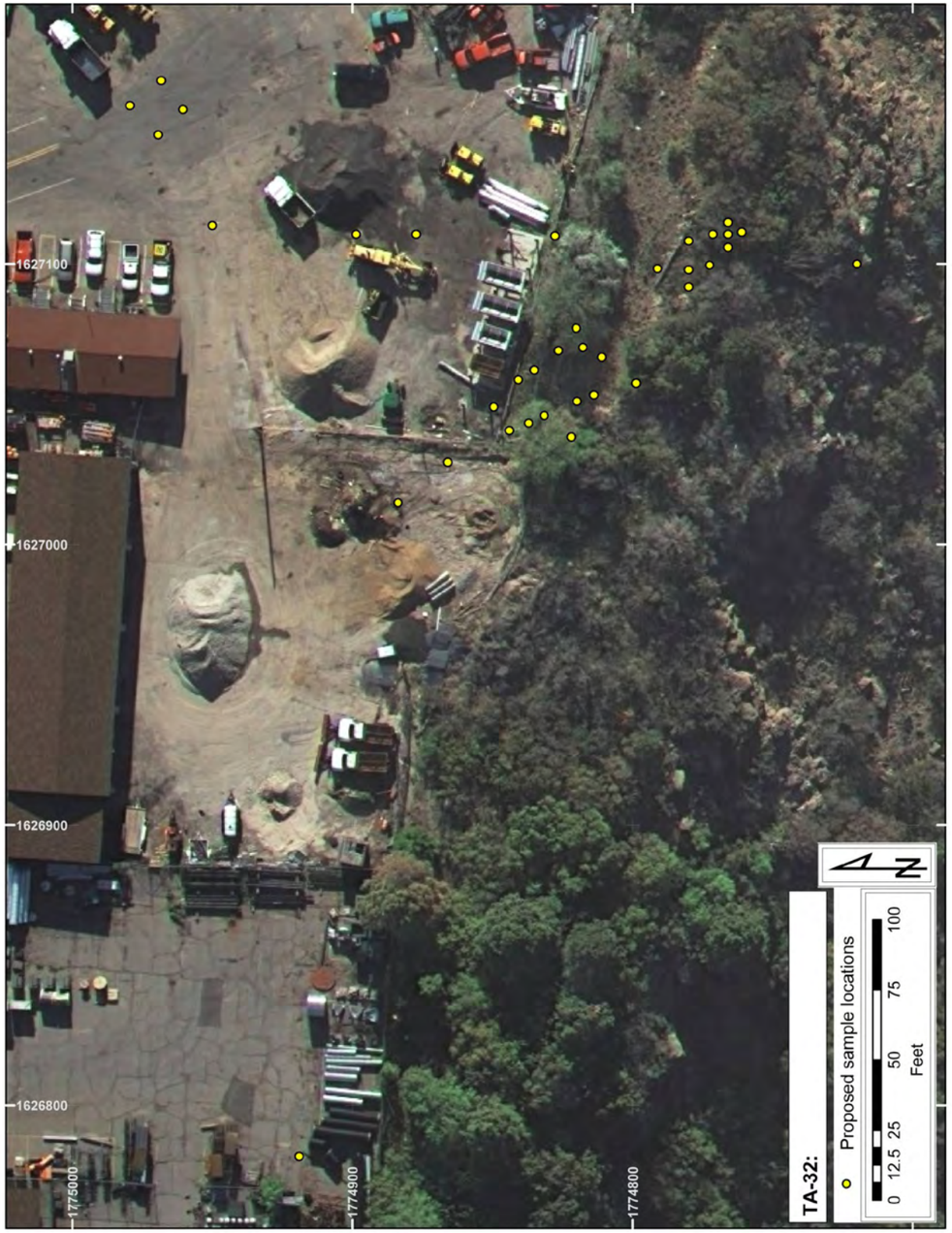


Figure 8.1-1 Los Alamos County materials staging at former TA-32

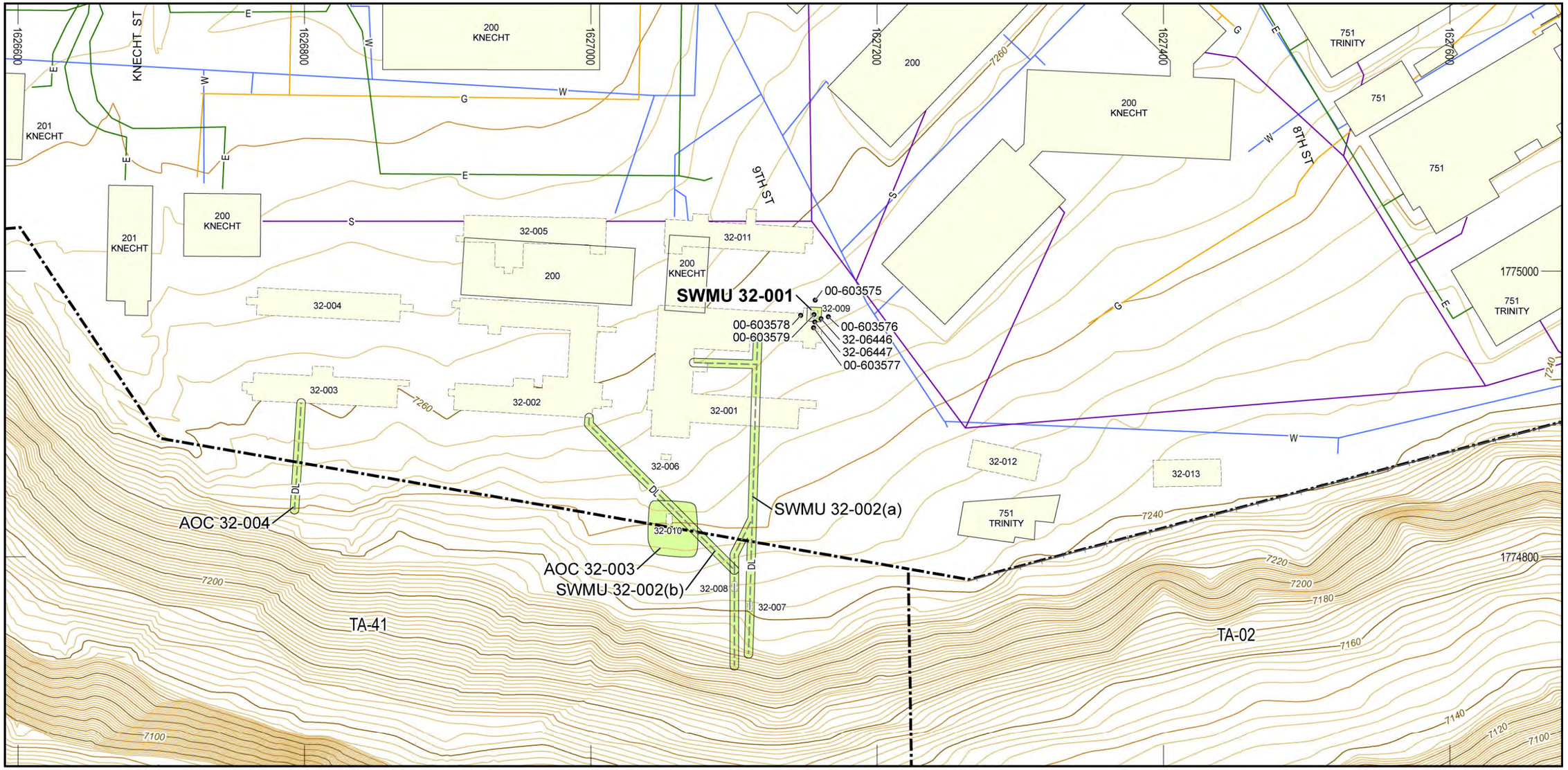


Figure 8.3-1 SWMU 32-001 site map and sampling locations

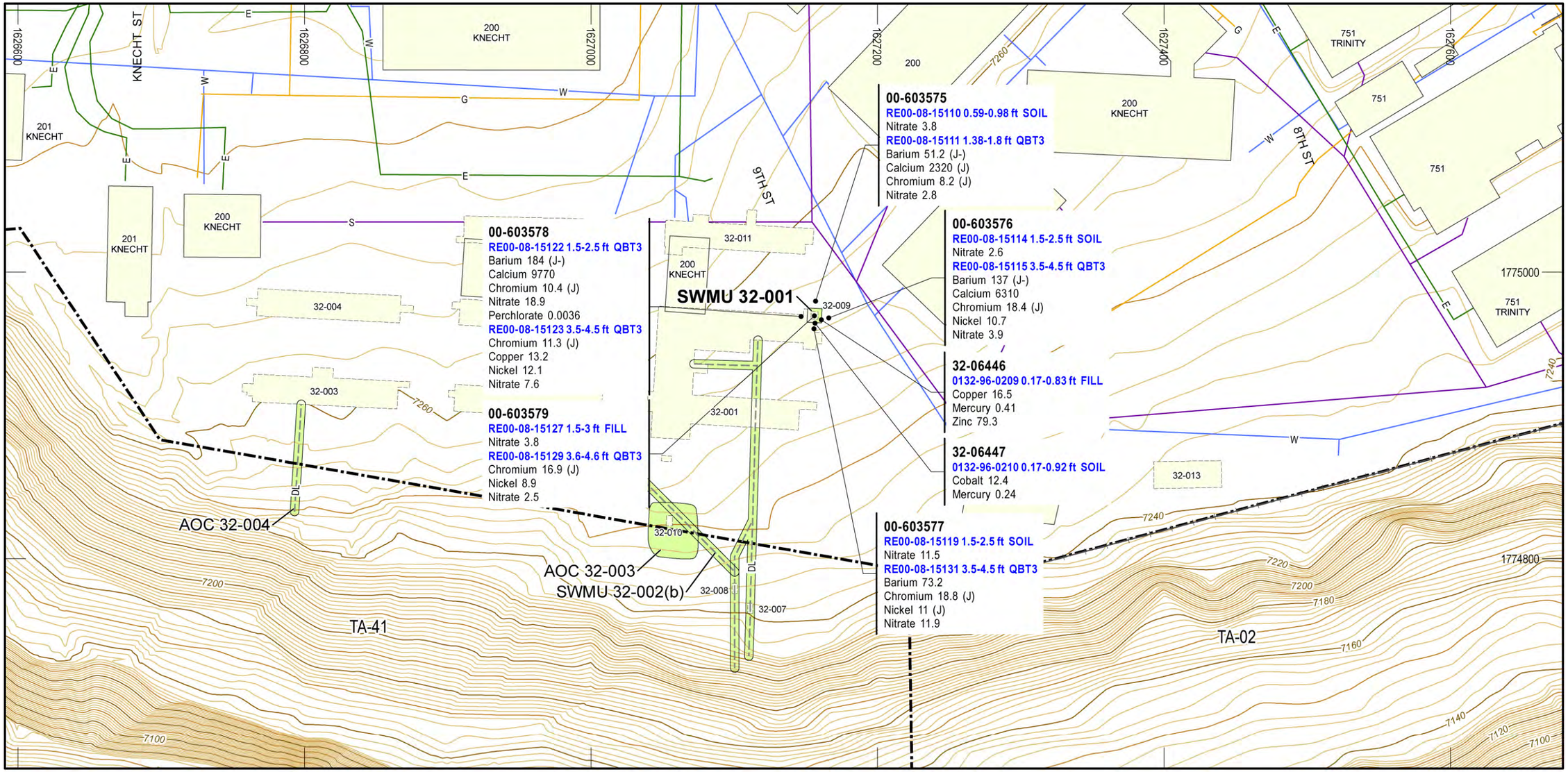


Figure 8.3-2 Inorganic COPCs detected or detected above BVs at SWMU 32-001

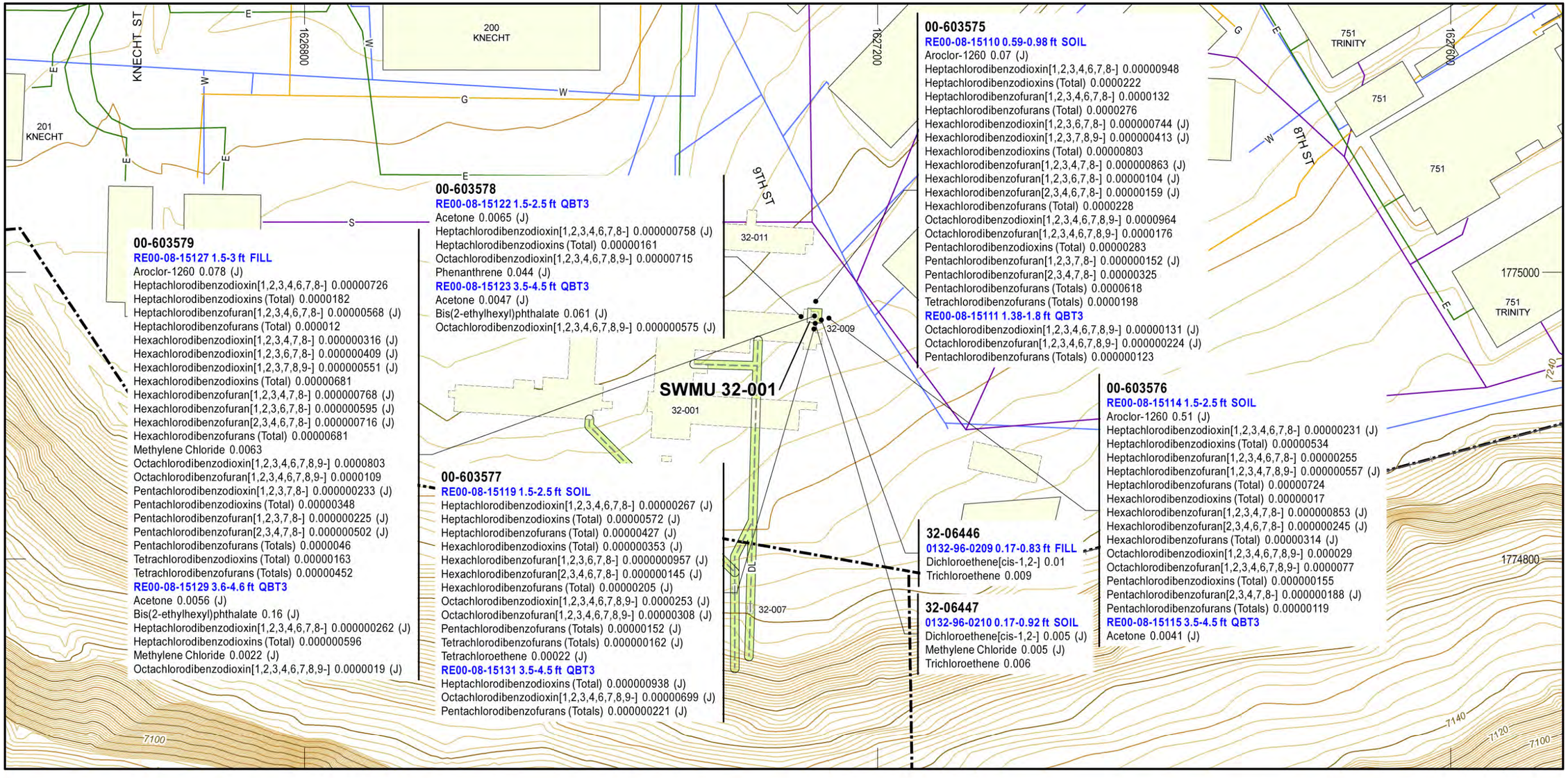


Figure 8.3-3 Organic COPCs detected at SWMU 32-001

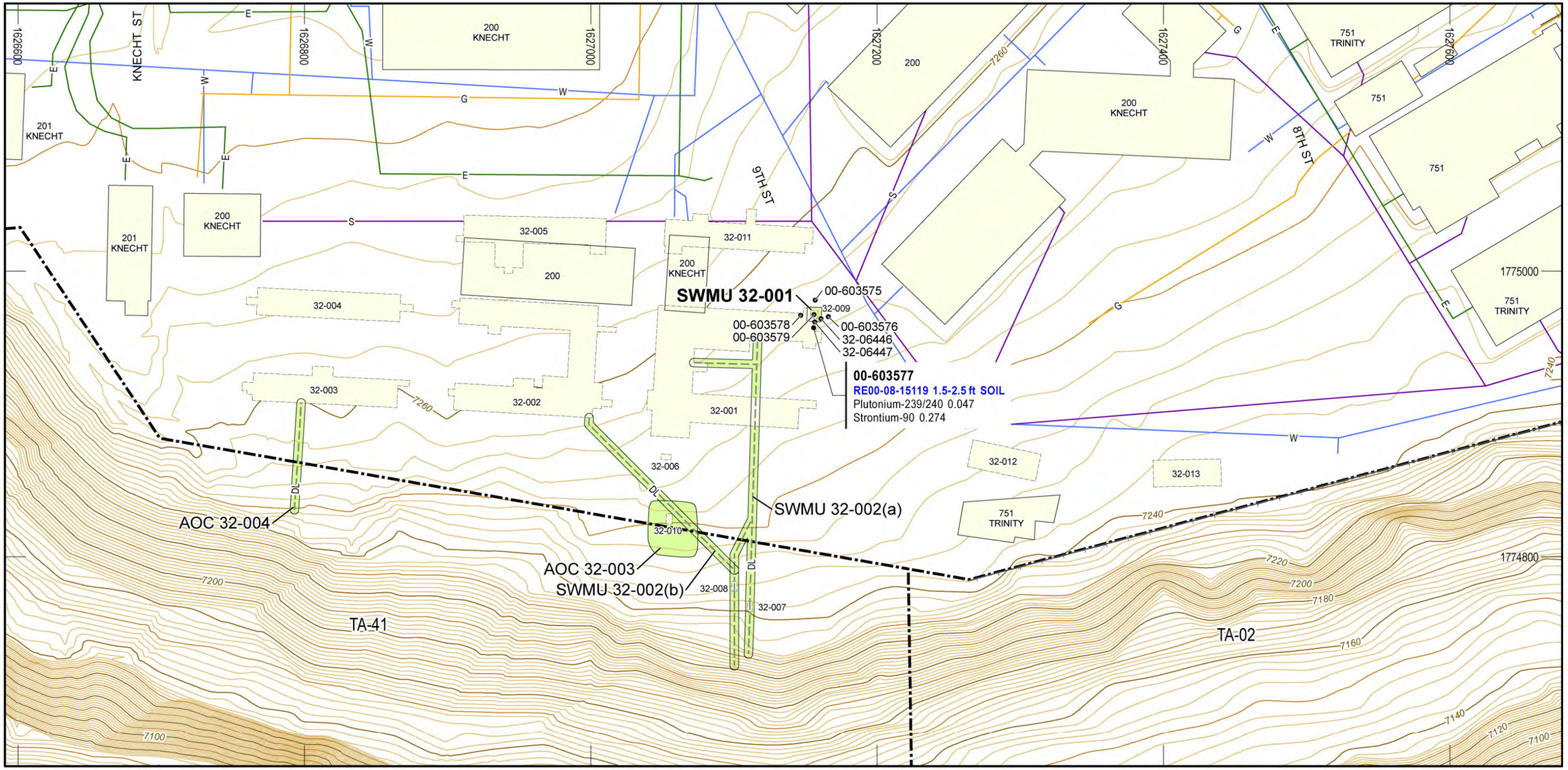


Figure 8.3-4 Radionuclide COPCs detected or detected above BVs/FVs at SWMU 32-001

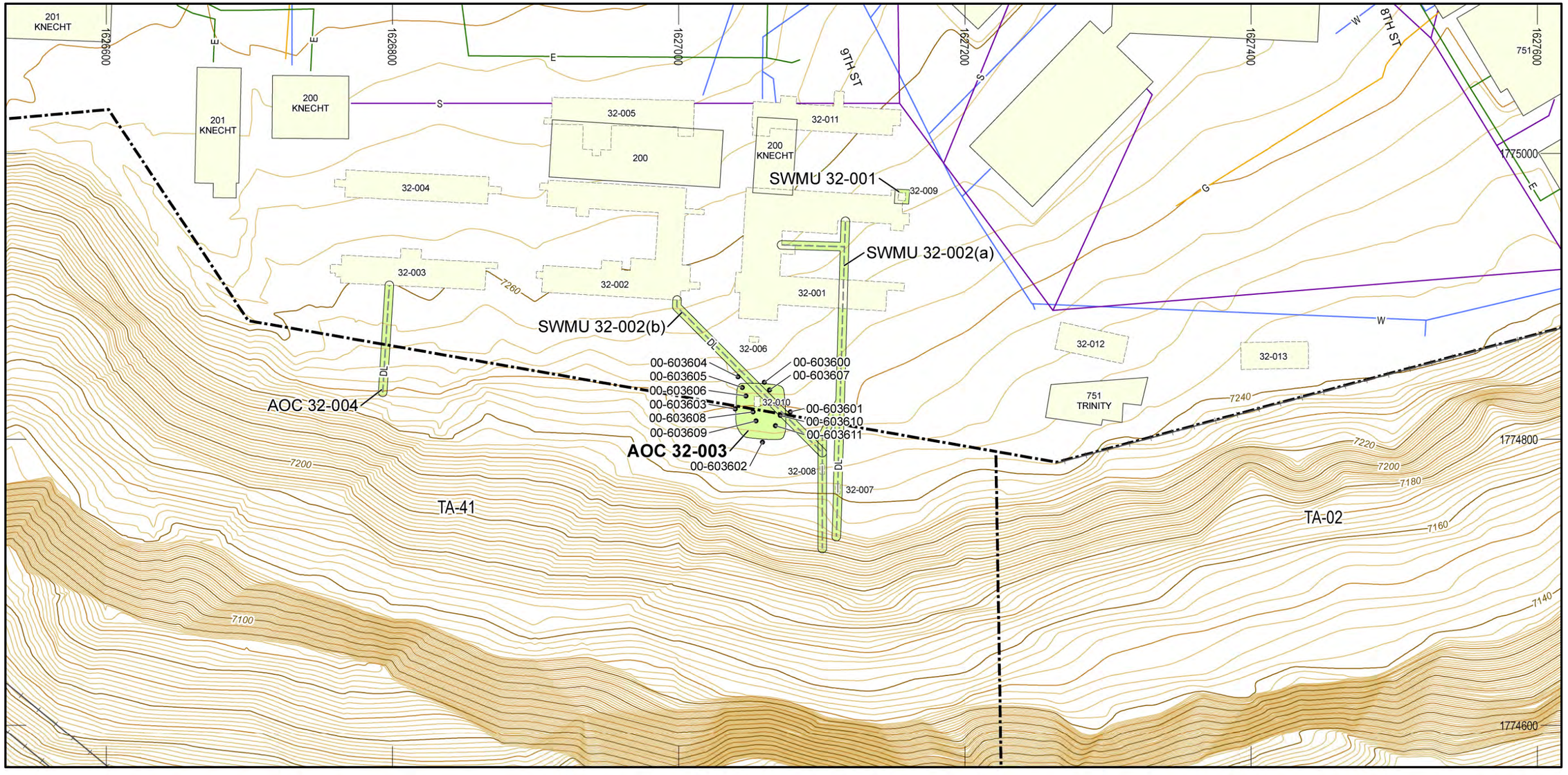


Figure 8.6-1 AOC 32-003 site map and sampling locations

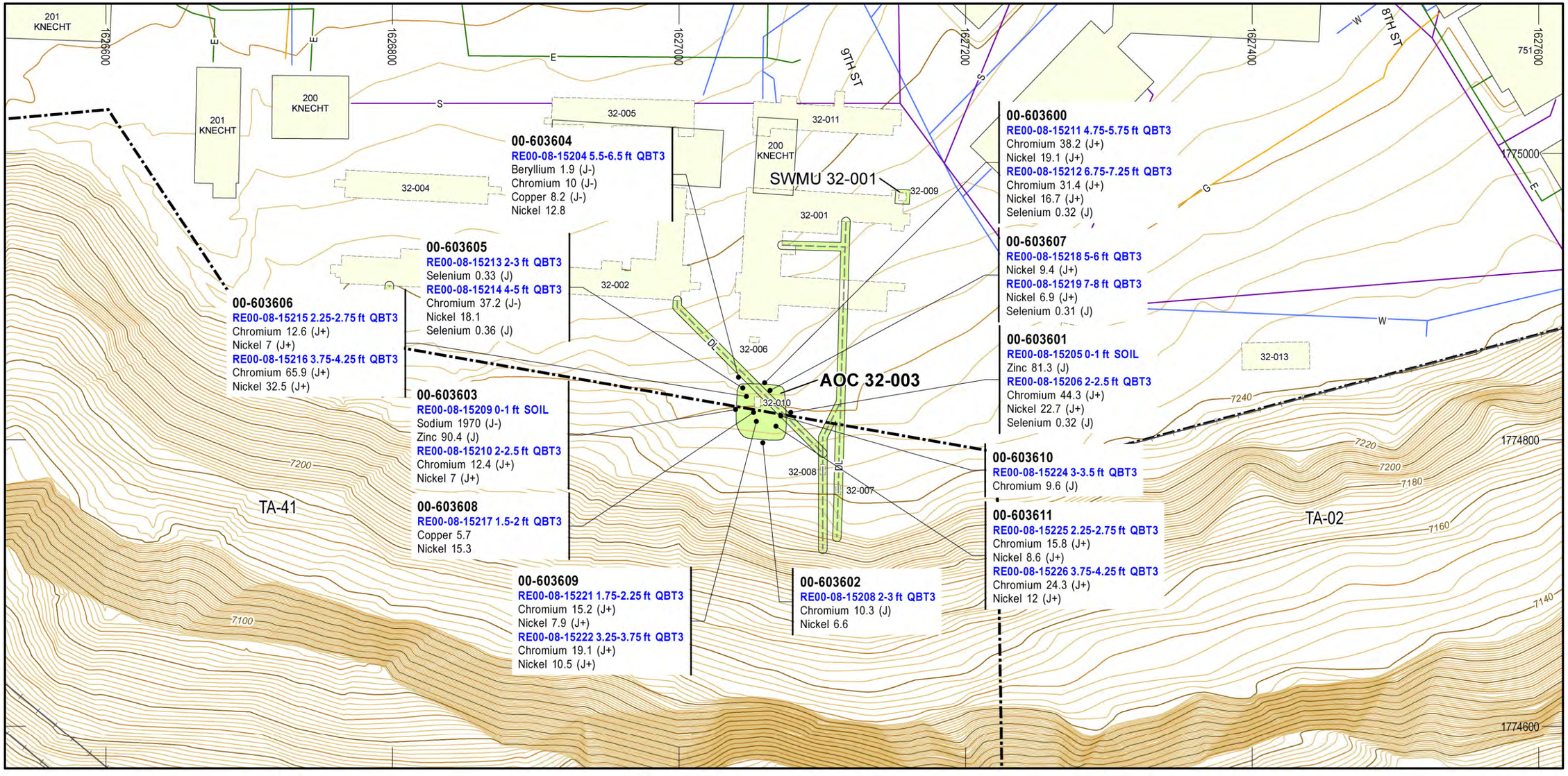


Figure 8.6-2 Inorganic COPCs detected or detected above BVs at AOC 32-003

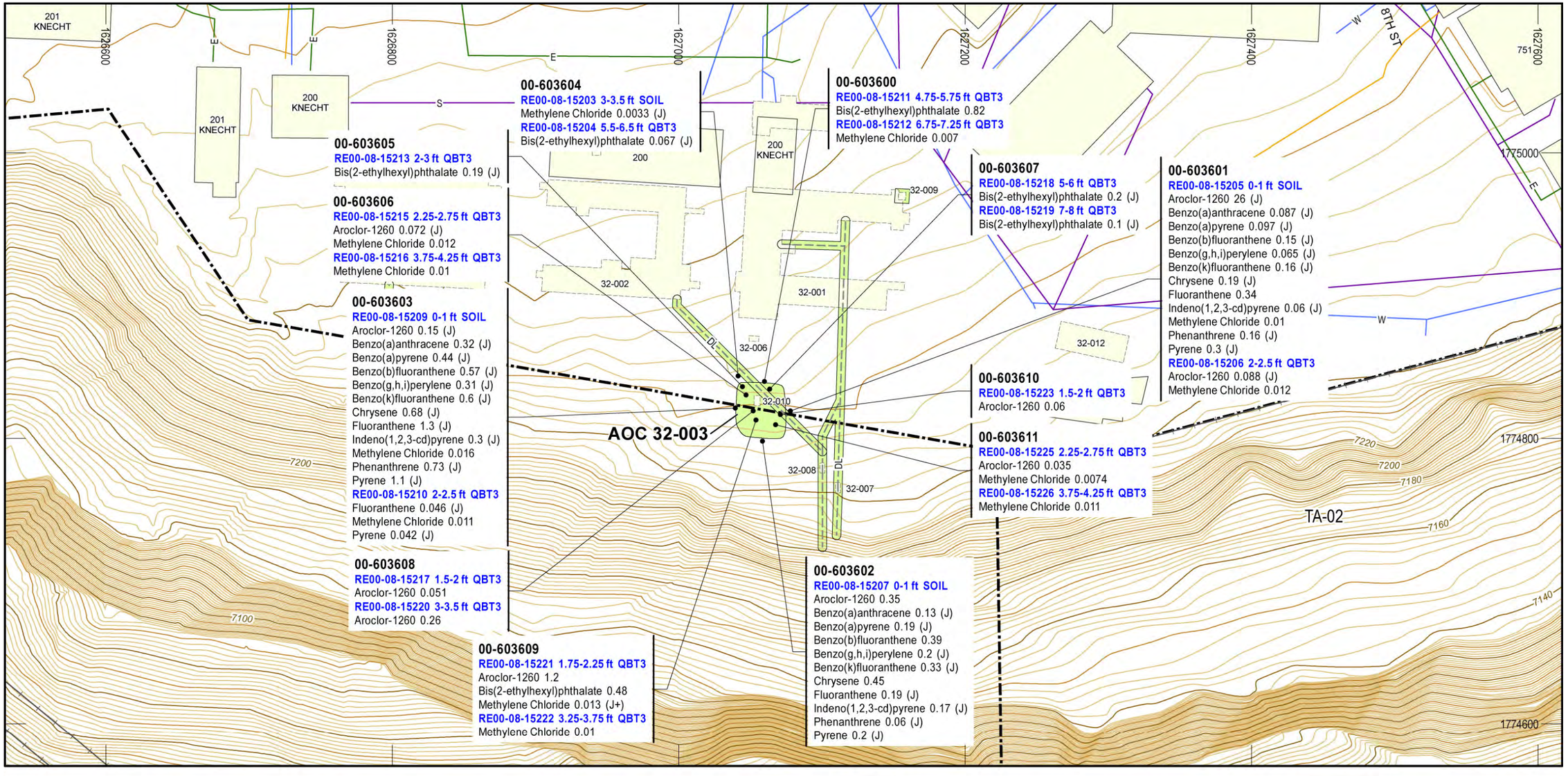


Figure 8.6-3 Organic COPCs detected at AOC 32-003

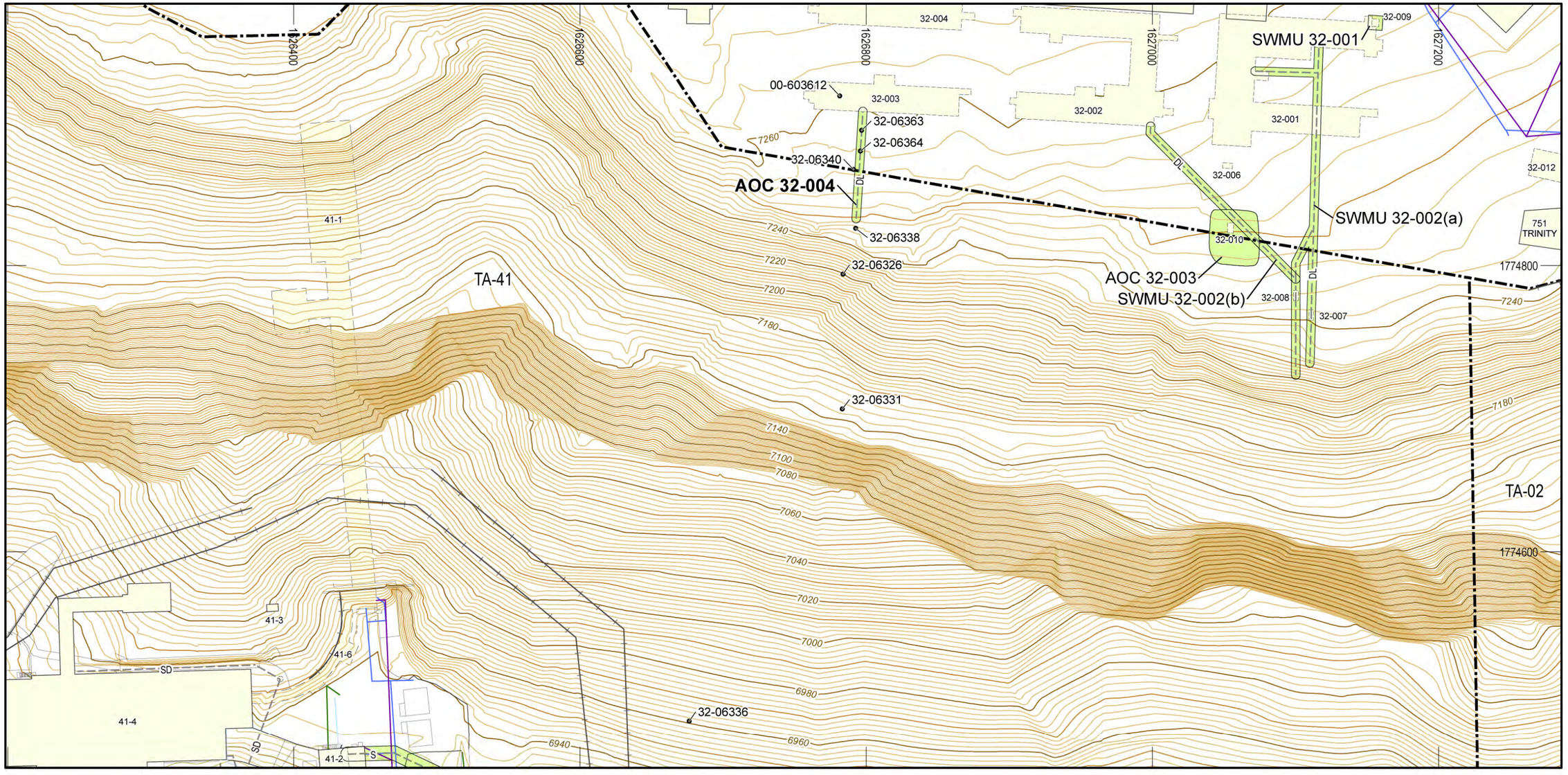


Figure 8.7-1 AOC 32-004 site map and sampling locations

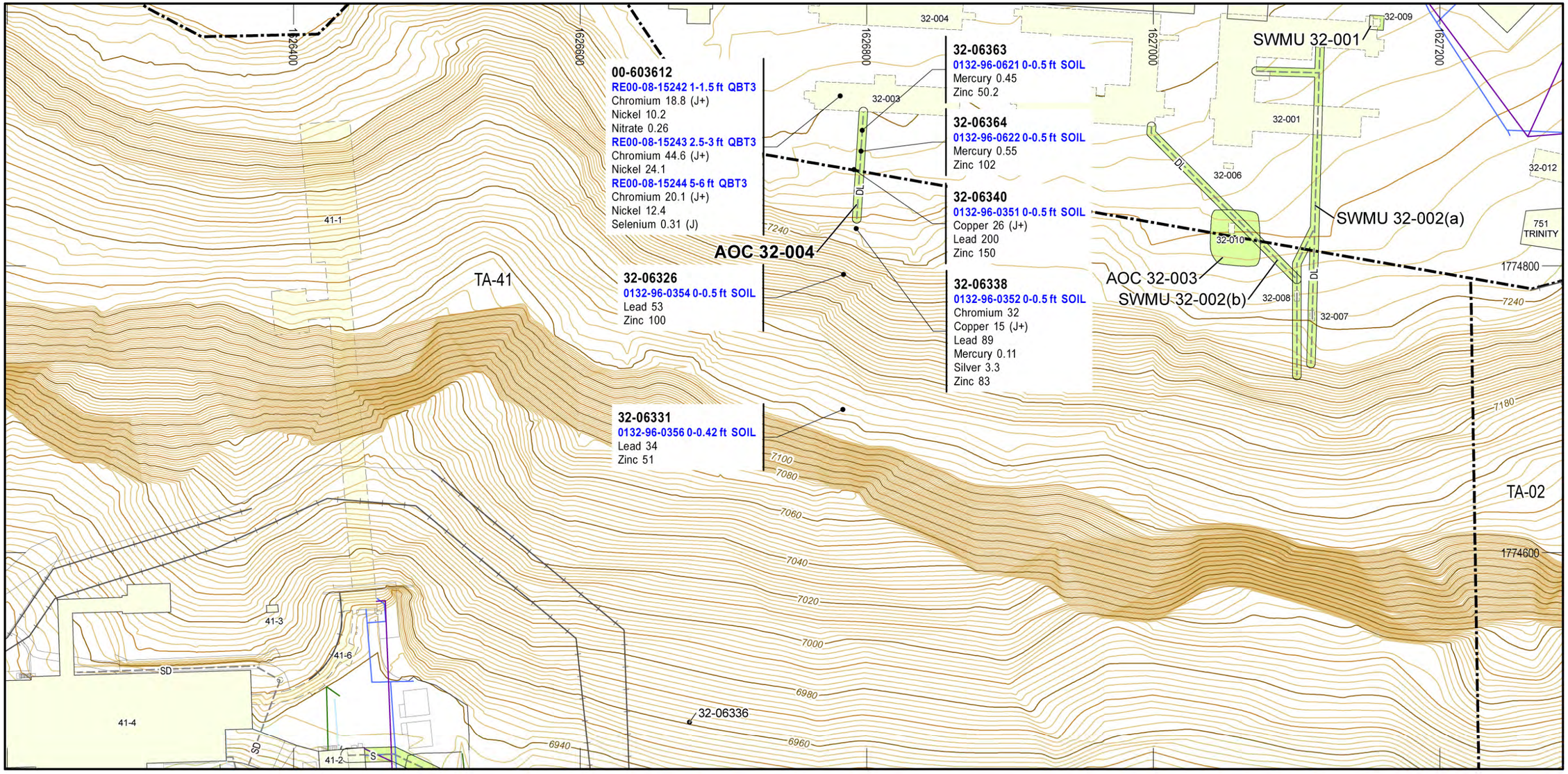


Figure 8.7-2 Inorganic COPCs detected or detected above BVs at AOC 32-004

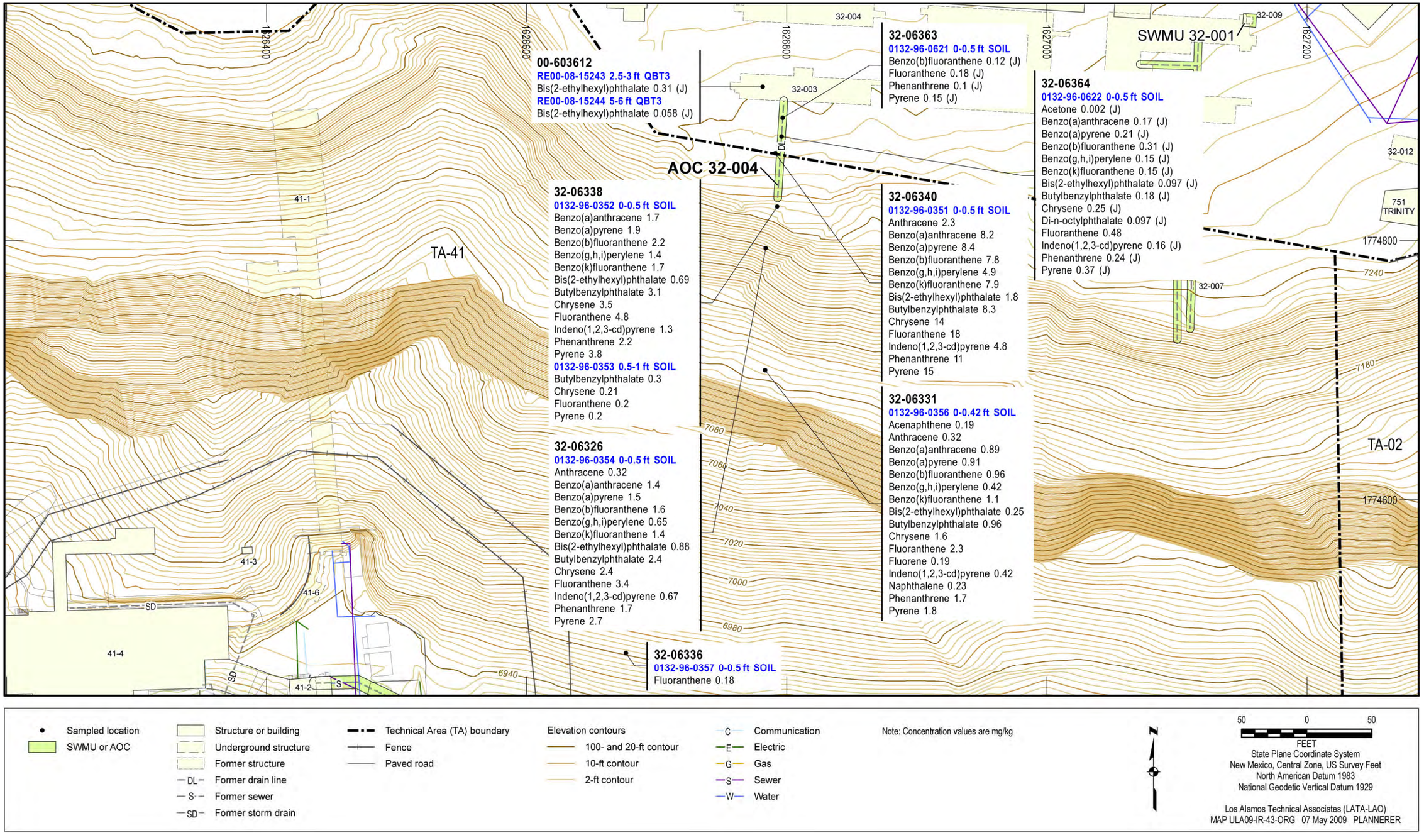


Figure 8.7-3 Organic COPCs detected at AOC 32-004

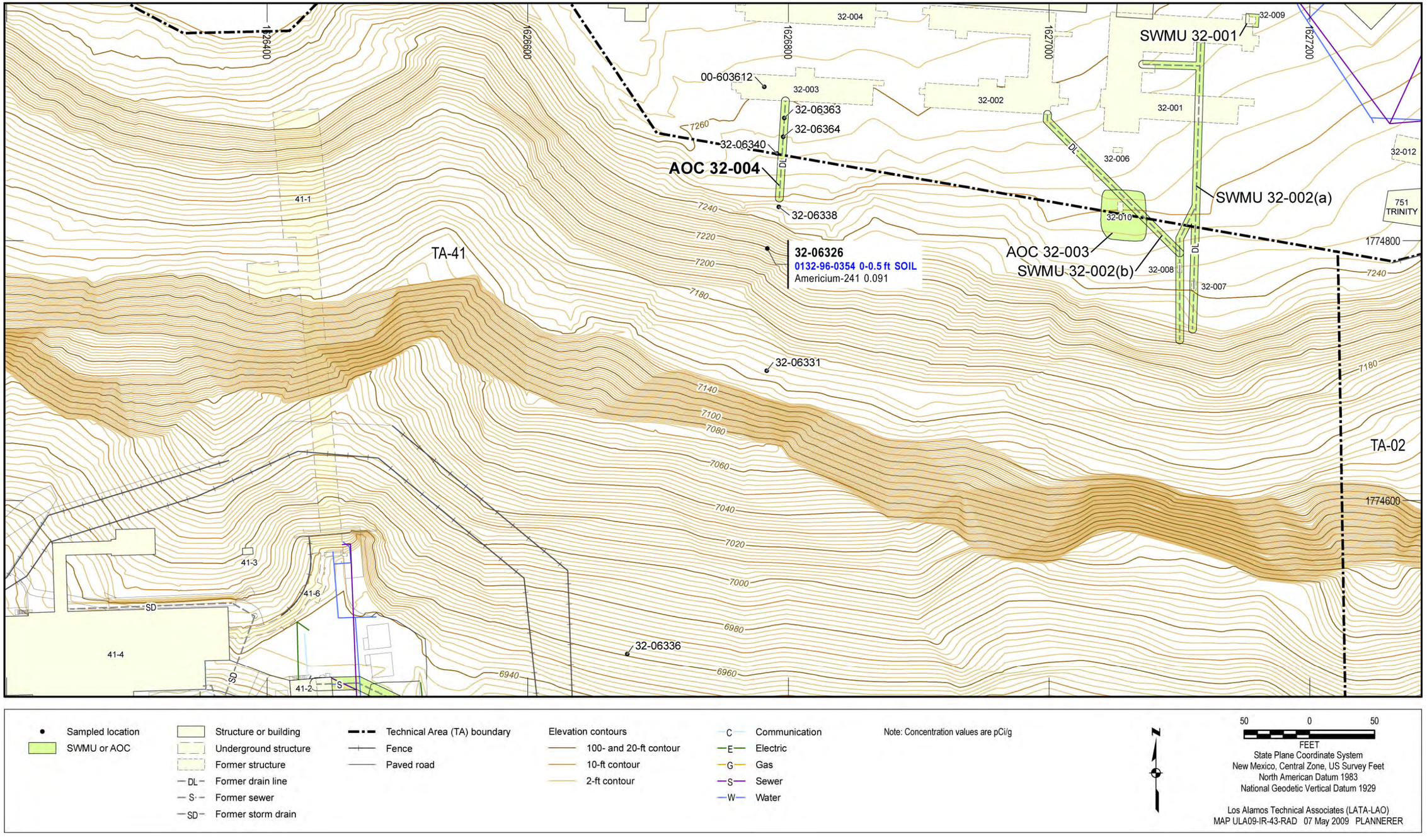


Figure 8.7-4 Radionuclide COPCs detected or detected above BVs/FVs at AOC 32-004

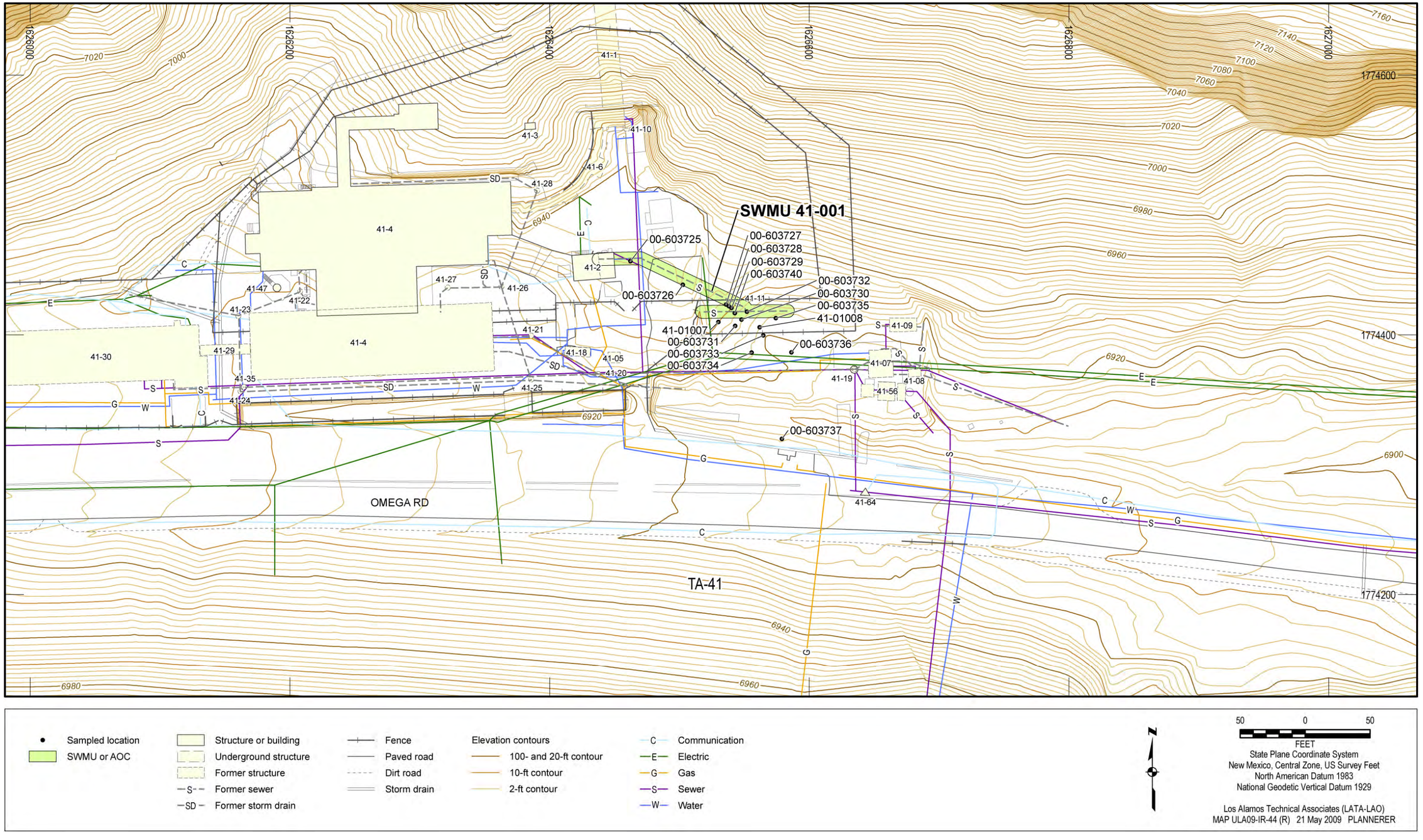


Figure 9.3-1 SWMU 41-001 site map and sampling locations

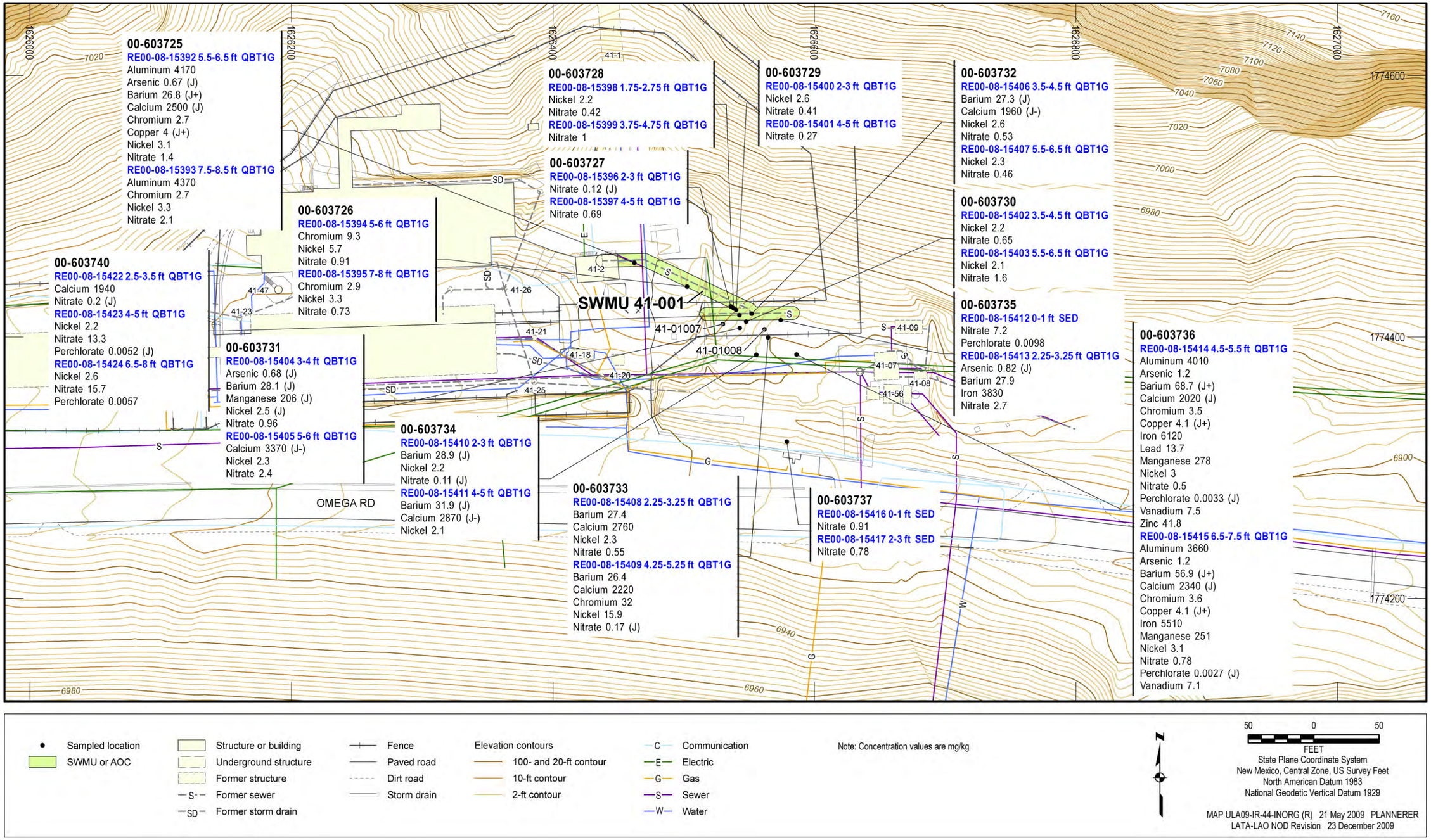


Figure 9.3-2 Inorganic COPCs detected or detected above BVs at SWMU 41-001

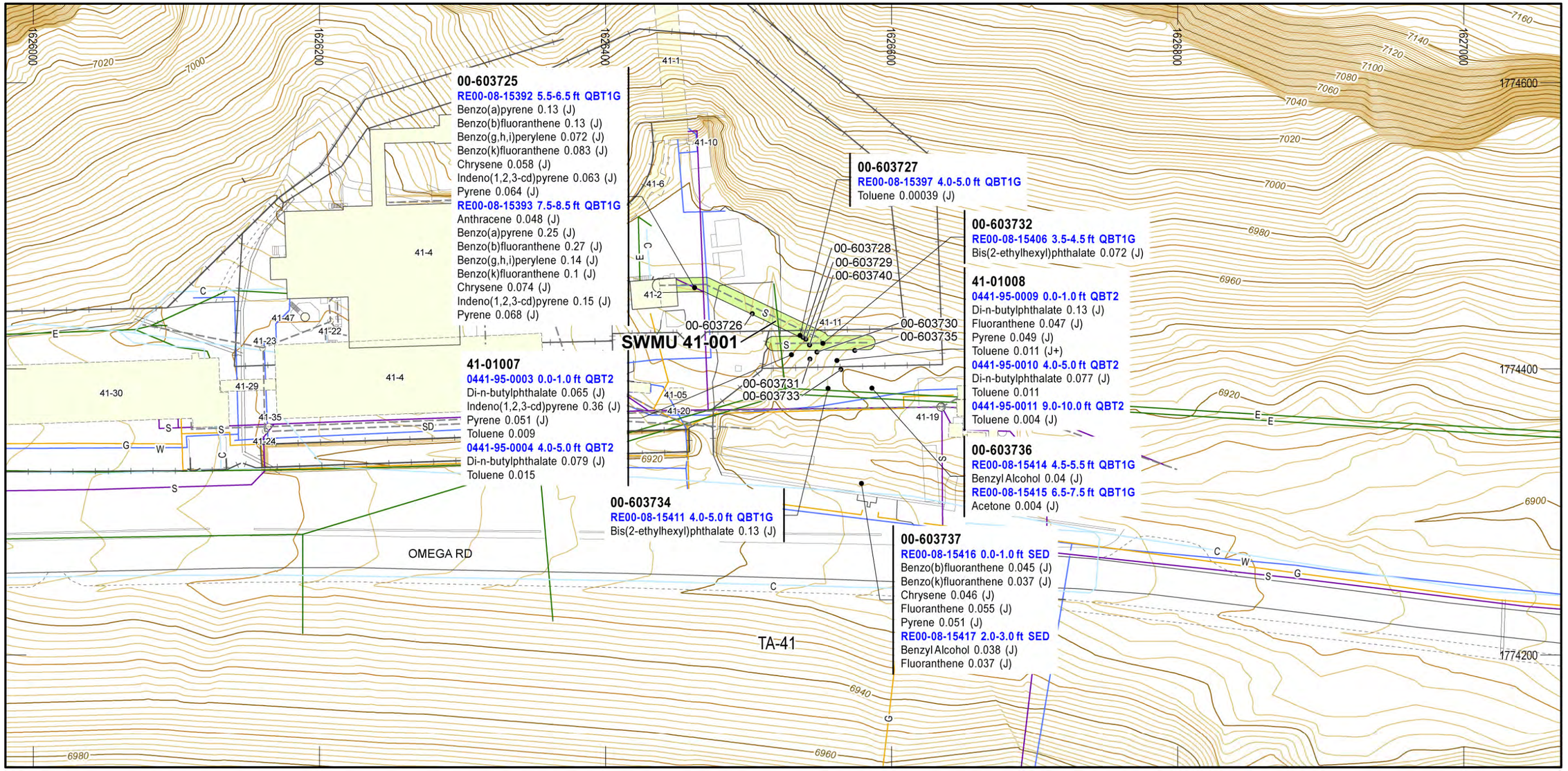


Figure 9.3-3 Organic COPCs detected at SWMU 41-001

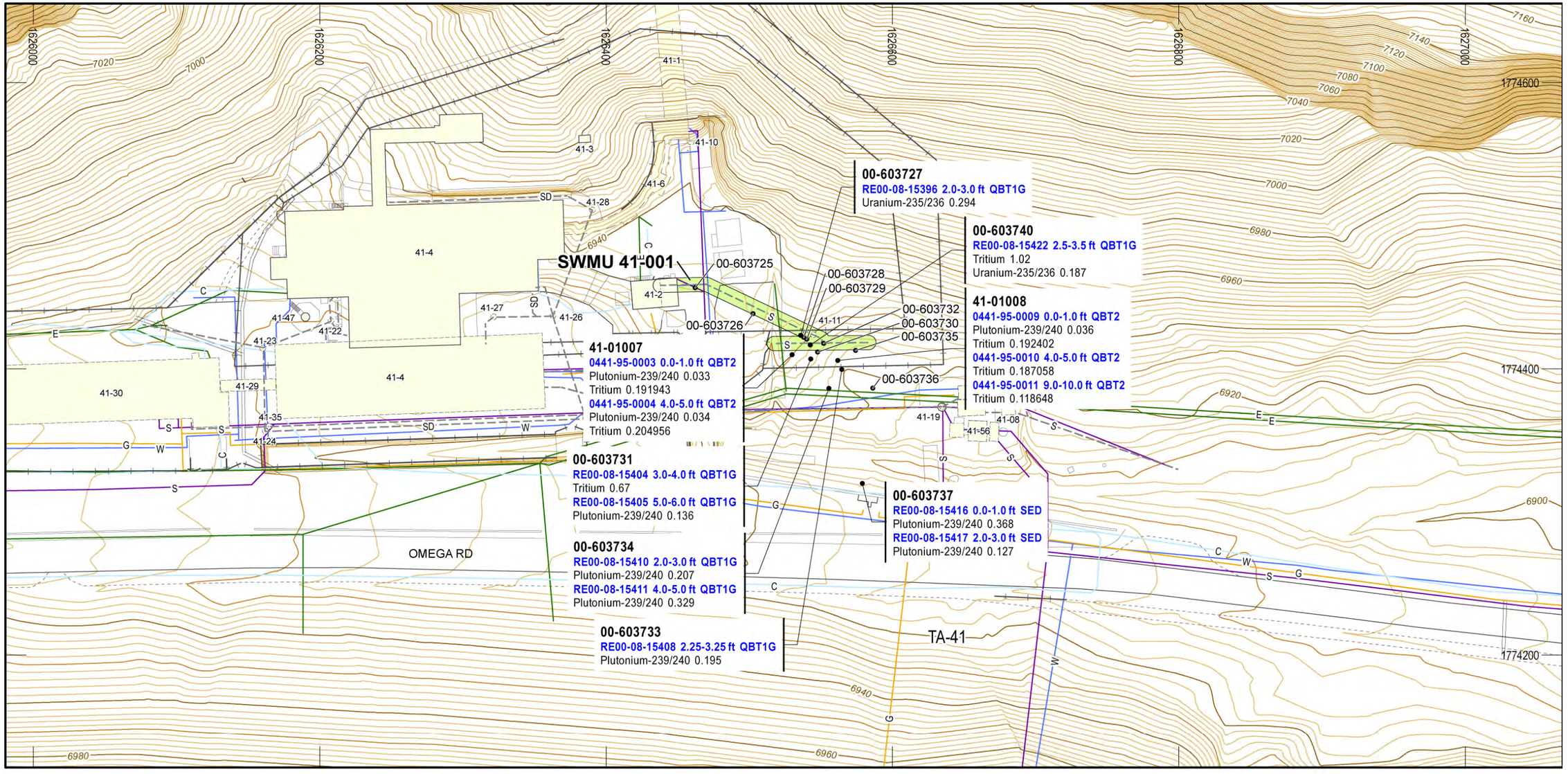


Figure 9.3-4 Radionuclide COPCs detected or detected above BVs/FVs at SWMU 41-001

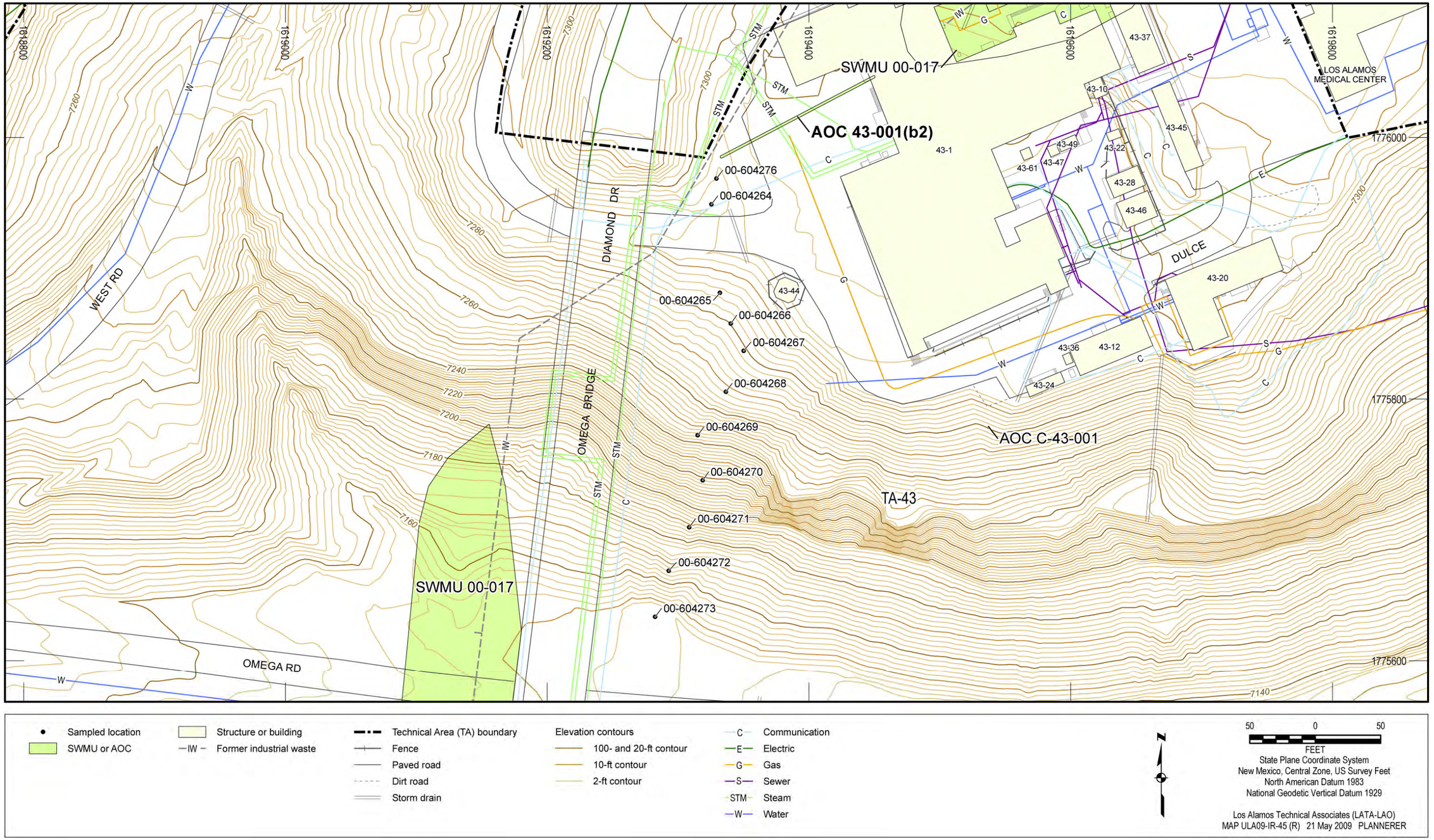


Figure 10.3-1 AOC 43-001(b2) site map and sampling locations

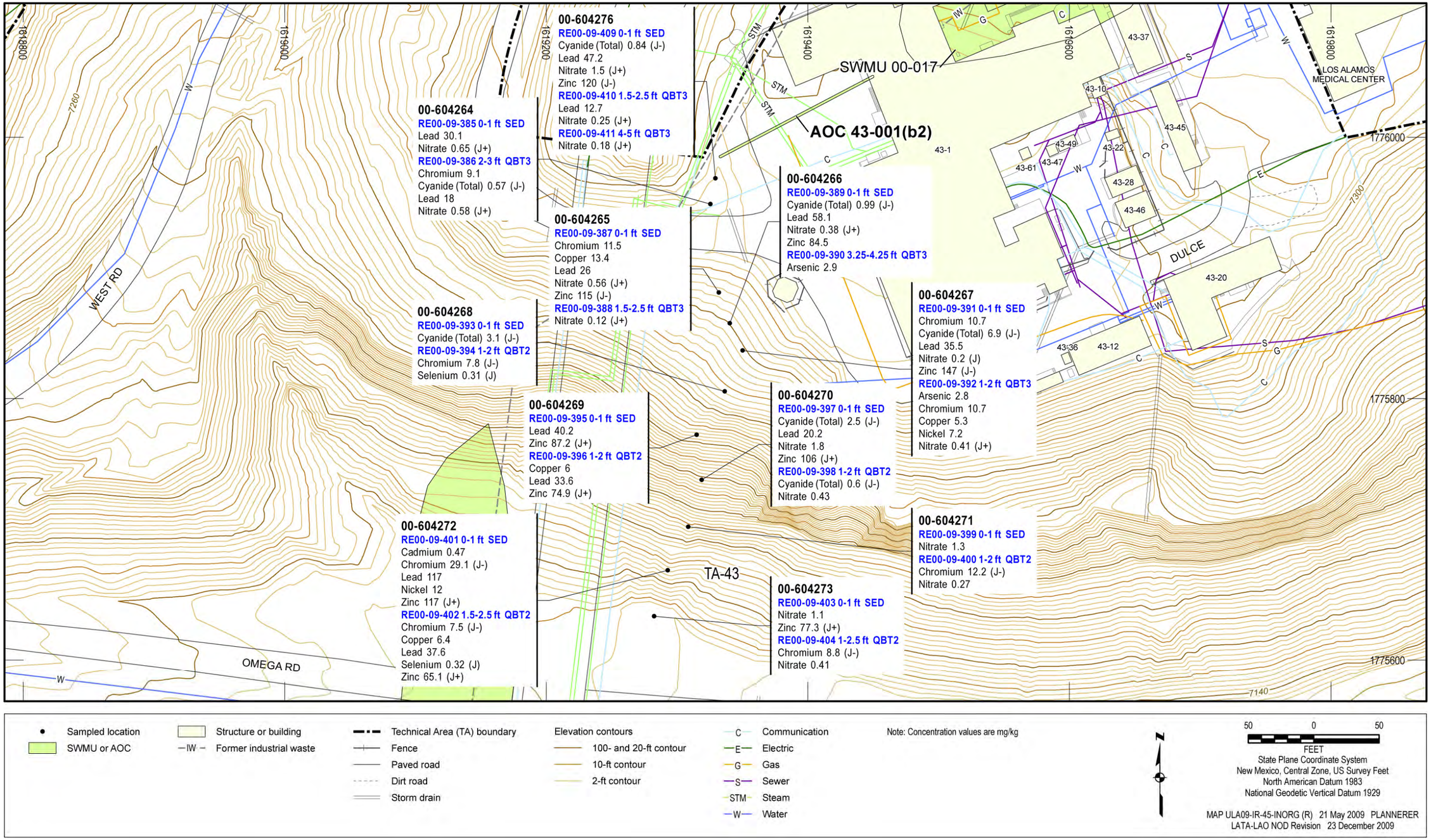


Figure 10.3-2 Inorganic COPCs detected or detected above BVs at AOC 43-001(b2)

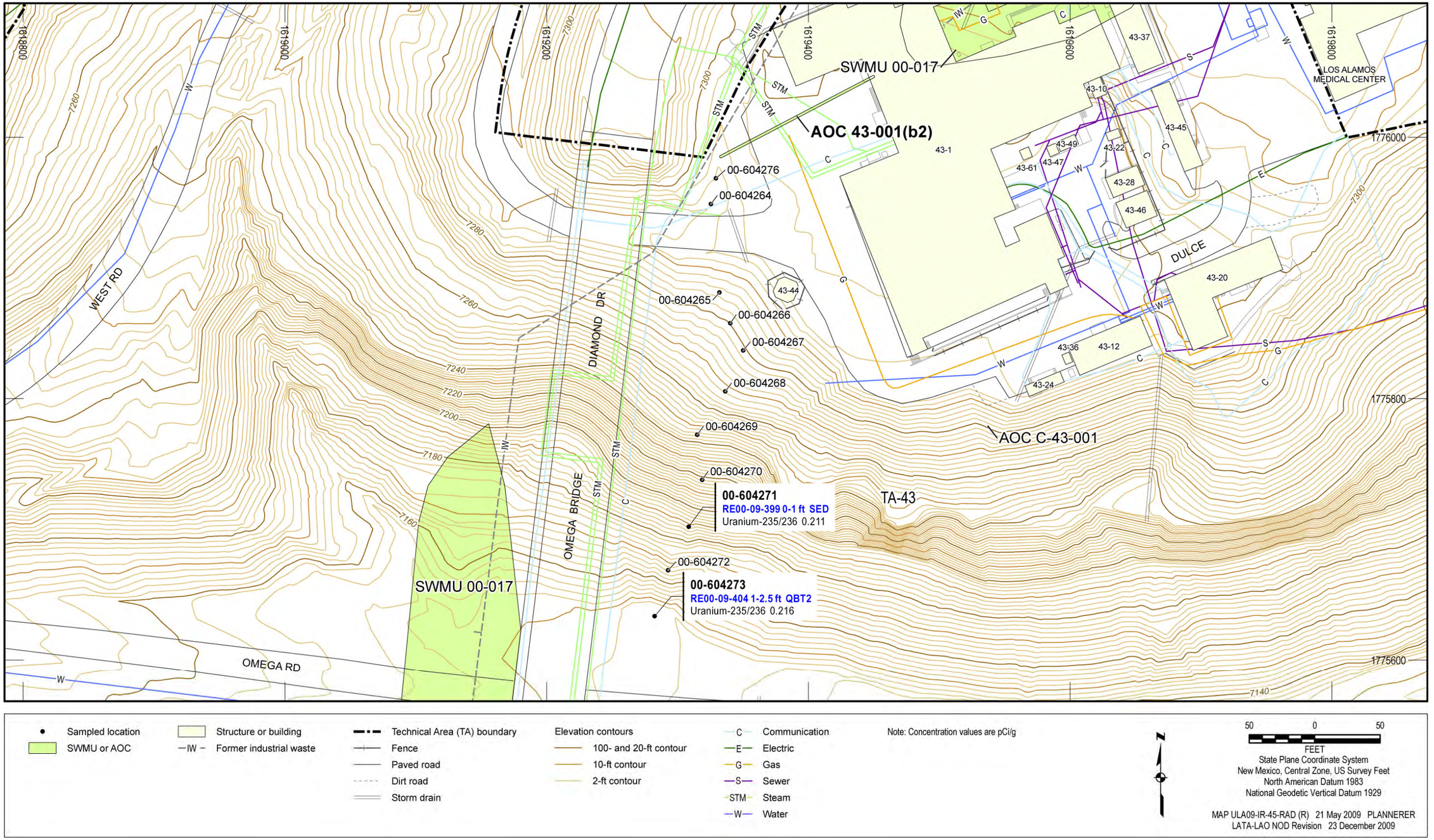


Figure 10.3-3 Radionuclide COPCs detected or detected above BVs/FVs at AOC 43-001(b2)

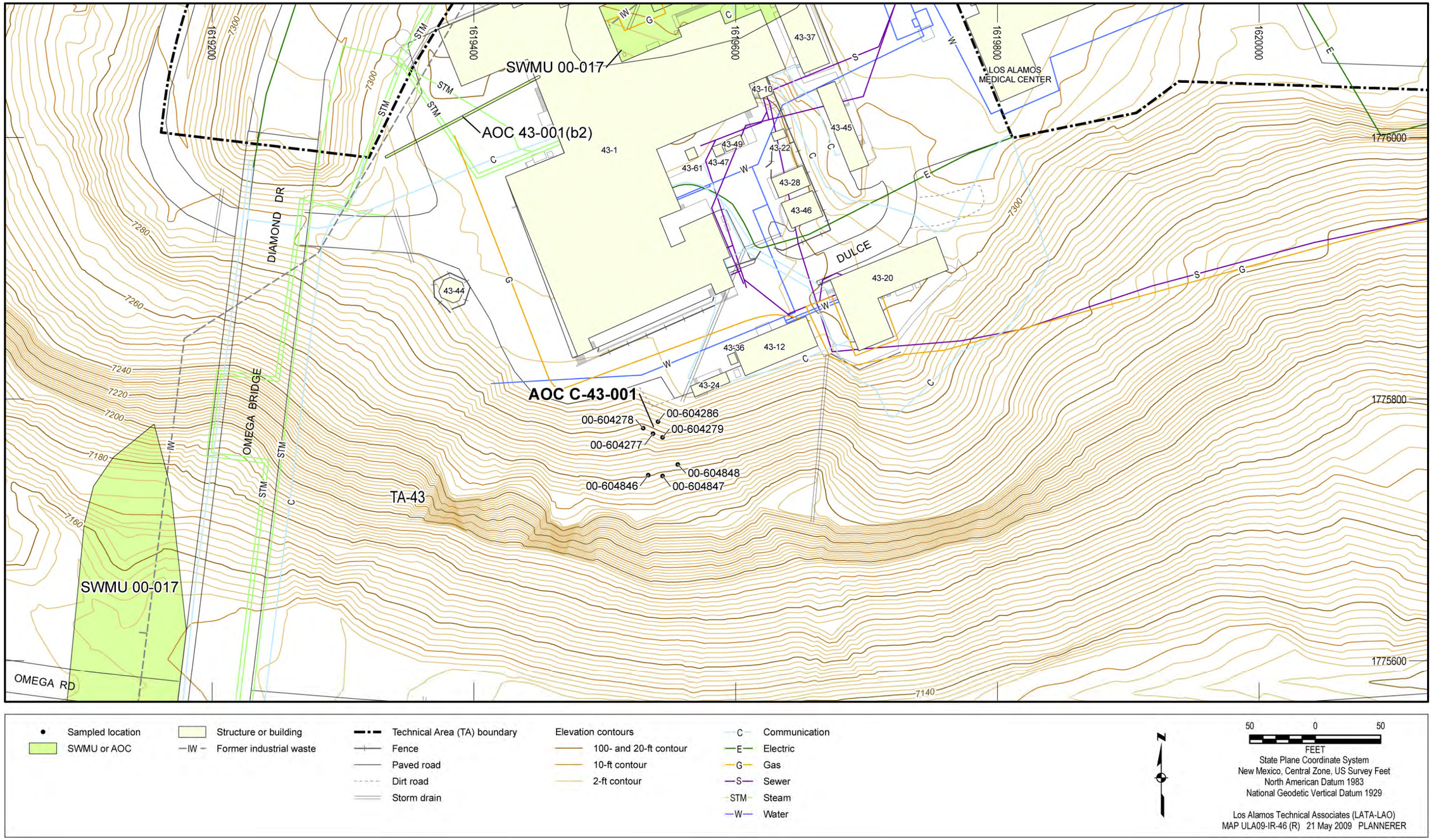


Figure 10.4-1 AOC C-43-001 site map and sampling locations

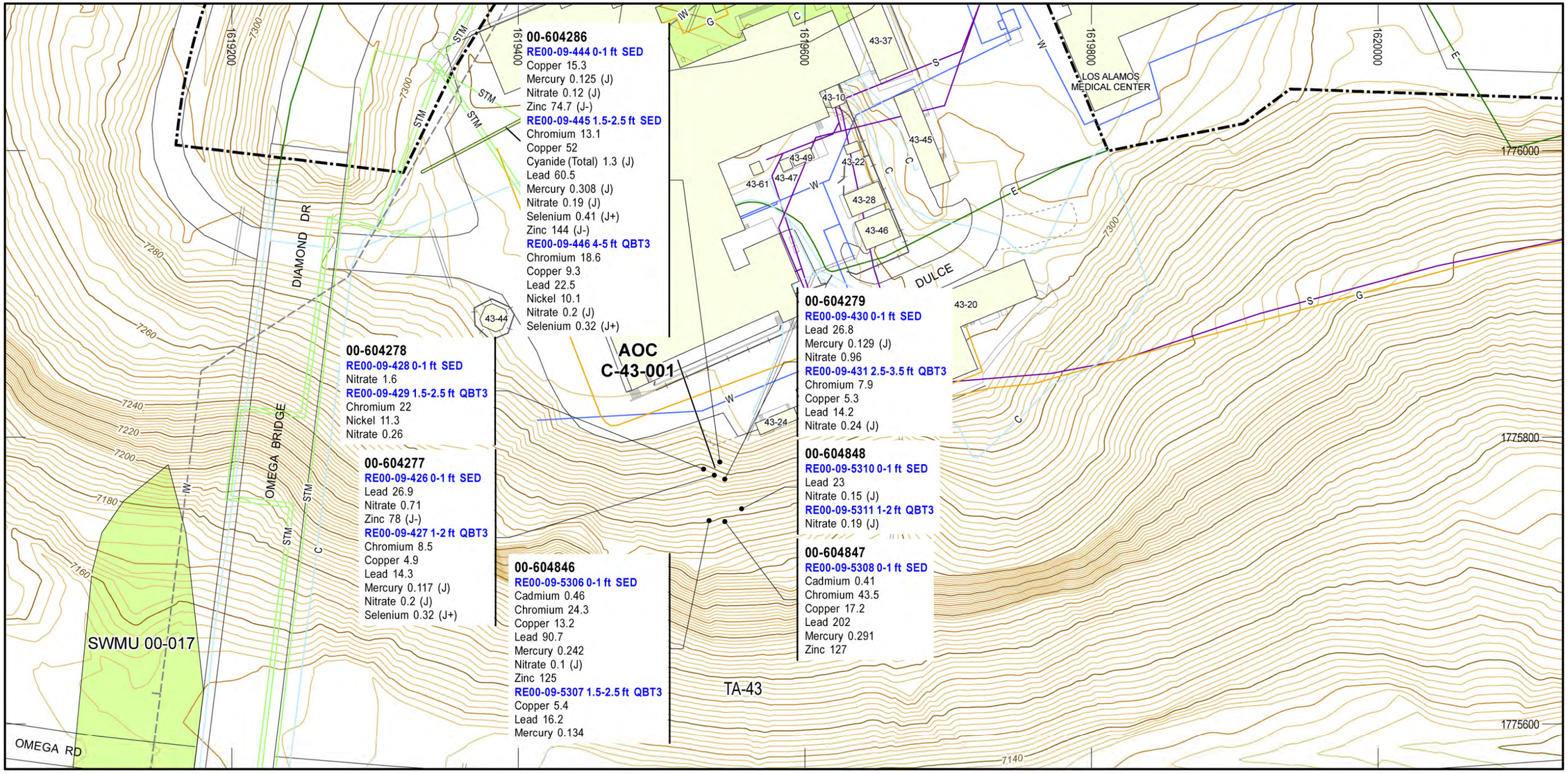


Figure 10.4-2 Inorganic COPCs detected or detected above BVs at AOC C-43-001

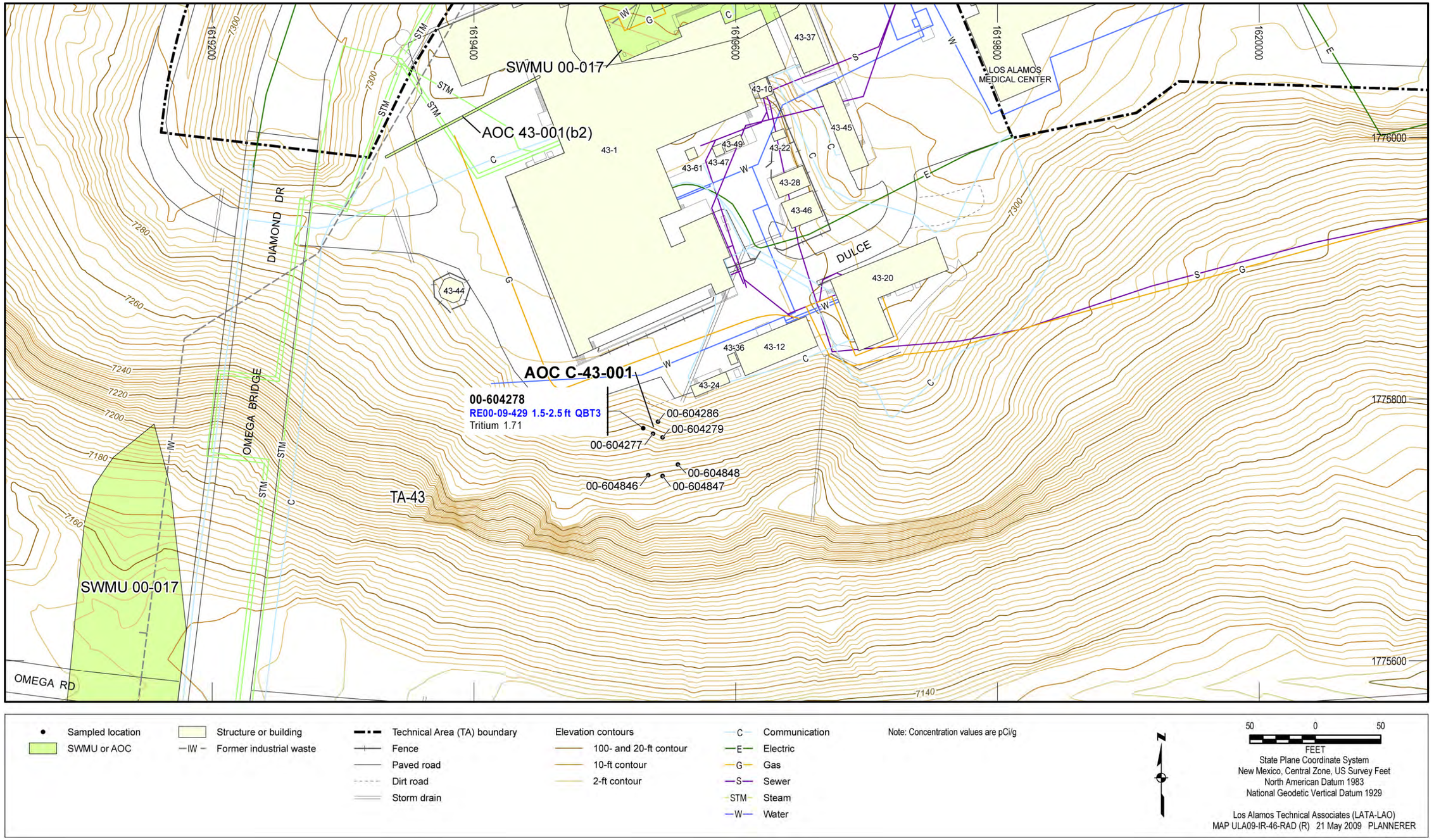


Figure 10.4-3 Radionuclide COPCs detected or detected above BVs/FVs at AOC C-43-001

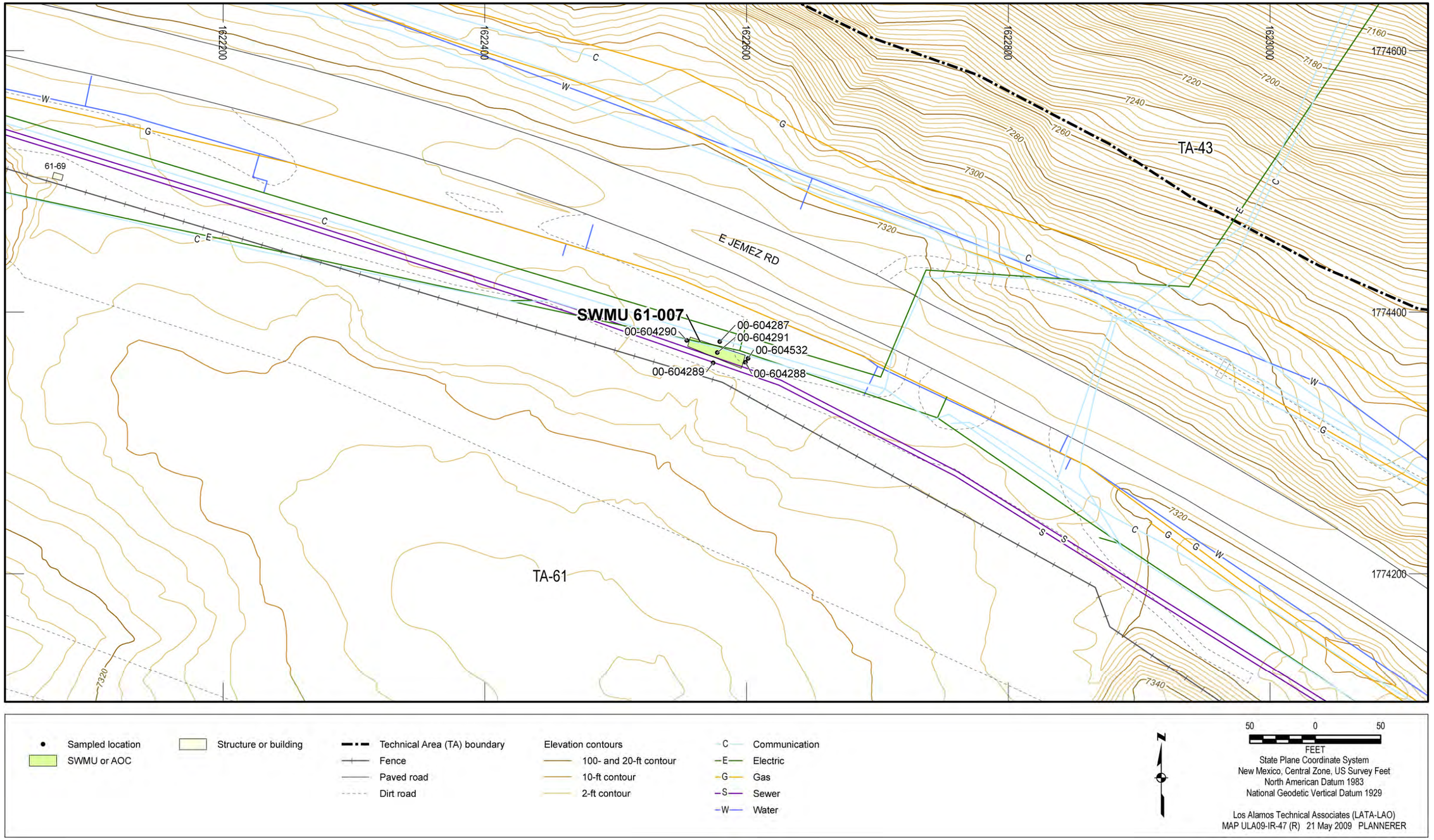


Figure 11.3-1 SWMU 61-007 site map and sampling locations

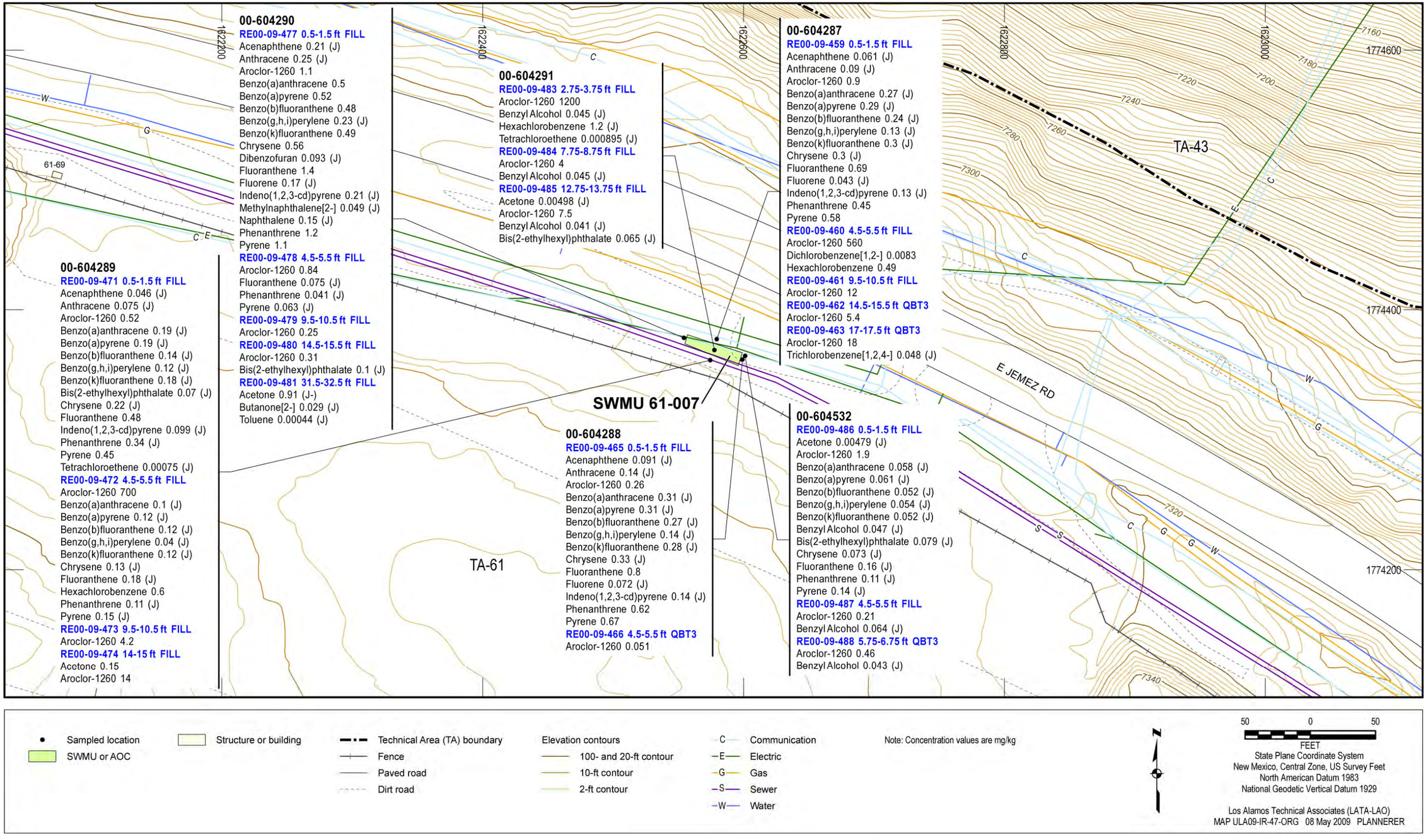


Figure 11.3-2 Organic COPCs detected at SWMU 61-007

Table 1.1-1
Sites under Investigation in Upper Los Alamos Canyon Aggregate Area

Consolidated Unit	SWMU/AOC	Site Description	Investigation(s) Prior to 2008	Investigation Conducted in 2008–2009
TA-00				
	SWMU 00-017	Industrial waste lines	1986 Line 167 removed except for nine concrete anchors Line 170: a 200-ft section left in place Line 171: a 365-ft section left in place 1998–1999 Phase I RFI	Sampled line 167; no sampling proposed for lines 170 and 171
	AOC 00-031(a)	Soil contamination beneath former service station (Zia building No. 5)	None	Sampled
	AOC 00-031(b)	Soil contamination beneath former Zia motor pool (two USTs)	1994 Phase I RFI (removed two USTs)	None; previously approved for no sampling (NMED 2006, 095460)
	AOC 00-034(b)	Landfill, western area	None	None; previously approved for no sampling (NMED 2006, 095460)
	AOC C-00-042	Waste oil UST beneath former Zia motor pool (formerly part of SWMU 00-032)	1995 VCA (removed tank)	None; previously approved for no sampling (NMED 2006, 095460)
TA-01				
01-001(a)-99 Miscellaneous TA-01	SWMU 01-001(a)	Septic tank 134, served warehouse 19 from 1949 to 1964	1975 Tank removed 1992 Phase I RFI	Sampled
	SWMU 01-001(b)	Septic tank 135, served the buildings FP (foundry) and M-1 (machining)	1975 Tank removed 1992 Phase I RFI	Sampled
	SWMU 01-001(c)	Septic tank 137, served the building D-2 (radioactive laundry)	1975 Tank removed 1992–1993 Phase I RFI	Sampled
	SWMU 01-001(d)	Septic tank 138, served buildings K (chemical stock room), V (uranium and beryllium machining), and Y (physics laboratory)	1975 Tank removed 1992–1994 Phase I RFI 1996–1997 Interim action	Sampled
	SWMU 01-001(e)	Septic tank 139, served D-5 Sigma vault (plutonium and uranium storage), building I (beryllium machining), and Delta building (laboratory)	Tank not found and determined to be removed prior to 1974	Sampled

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC	Site Description	Investigation(s) Prior to 2008	Investigation Conducted in 2008–2009
	SWMU 01-001(f)	Septic tank 140, served the buildings HT (heat treat and machining) and FP (foundry)	1976 Tank removed 1992–1993 Phase I RFI 1996 VCA	Sampled
	SWMU 01-001(g)	Septic tank 141, served building X (radioactive target testing)	1975 Tank removed 1992 Phase I RFI	Sampled
	SWMU 01-001(o)	Sanitary waste line, served buildings J (laboratory) and ML (medical laboratory)	1959 and 1975 Waste line removed 1992 Phase I RFI	Sampled
	SWMU 01-001(s)	Western sanitary waste line, main line	1973 Section of the line removed 1994 and 1996 More sections removed 1996 Interim action	Sampled
	SWMU 01-001(t)	Eastern sanitary waste line	1993 Phase I RFI	Sampled
	SWMU 01-001(u)	Western sanitary waste line, branch line	1994 Geophysical survey and borehole drilling/sampling	Sampled
	SWMU 01-002	Industrial waste line, handled chemical and radioactive process wastes from 1943 to 1951	1974–1976 Ahlquist radiological survey 1985 Last line sections removed 1990 Interim action between Central Ave. and Rose St. 1993–1994 Phase I RFI	Sampled
	SWMU 01-003(a)	Bailey Bridge landfill, used for disposal of demolition debris	1988 ER Program site reconnaissance survey 1992 Phase I RFI 1994 Debris mapping and screening	Sampled
	SWMU 01-003(b)	Surface disposal area, used for surface disposal of construction debris	1993 Site walkover 1996 Site walkover	Sampled
	SWMU 01-003(e)	Surface disposal site (construction debris of unknown origin)	1992 Phase I RFI	Sampled
	SWMU 01-006(a)	Cooling tower drainline and outfall, served cooling tower 80	1987 DOE verification survey 1992 Phase I RFI	Sampled

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC	Site Description	Investigation(s) Prior to 2008	Investigation Conducted in 2008–2009
	SWMU 01-006(b)	Drainline and outfall, served building D (plutonium processing)	1974–1976 Ahlquist radiological survey 1992–1993 Phase I RFI	Sampled
	SWMU 01-006(c)	Drainlines and outfalls, served building D-2 (radioactive laundry)	1974–1976 Ahlquist radiological survey	Sampled
	SWMU 01-006(d)	Drainline and outfall, served building D-3 (counting room)	1992–1993 Phase I RFI	Sampled
	AOC 01-006(e)	Drainlines and outfalls to Ashley Pond, served building P (personnel offices) and the cleaning plant	None conducted for drainlines 1966–1991 Pond water replaced and soil removed from pond bottom 1992 Pond water and sediment sampled	Sampled
	AOC 01-006(g)	Stormwater drainage system, served building D and several others	1974–1976 Ahlquist radiological survey 1992 Phase I RFI	Sampled
	SWMU 01-006(h)	Stormwater drainage system, served buildings R (plumbing, carpentry, etc.) and Y (physics laboratory)	1974–1976 Ahlquist radiological survey	Sampled
	SWMU 01-006(n)	Stormwater drainage system, served building D	1974–1976 Ahlquist radiological survey	Sampled
	SWMU 01-006(o)	Stormwater drainage system, served administrative buildings, shops, storage, and building H (polonium preparation)	1974–1976 Ahlquist radiological survey	Sampled
	SWMU 01-007(a)	Suspected subsurface soil radiological contamination near building D	1974–1976 Ahlquist radiological survey 1992–1993 Phase I RFI	Sampled
	SWMU 01-007(b)	Suspected subsurface soil radiological contamination near building D-2	1974–1976 Ahlquist radiological survey 1992–1993 Phase I RFI	Sampled
	SWMU 01-007(c)	Suspected subsurface soil radiological contamination, northwest of building D	1974–1976 Ahlquist radiological survey	Sampled
	SWMU 01-007(d)	Suspected subsurface soil radiological contamination due to overflow of the industrial waste line in 1946	1974–1976 Ahlquist radiological survey 1994 Phase I RFI	Sampled

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC	Site Description	Investigation(s) Prior to 2008	Investigation Conducted in 2008–2009
	SWMU 01-007(e)	Suspected subsurface soil radiological contamination near Sigma building (plutonium, uranium, and thorium machining)	1974–1976 Ahlquist radiological survey	Sampled
	SWMU 01-007(j)	12 areas of suspected subsurface soil radiological contamination	1974–1976 Ahlquist radiological survey	Sampled
	SWMU 01-007(l)	Suspected subsurface soil contamination; fill material under Trinity Drive suspected of originating from the building D area.	1974–1976 Ahlquist radiological survey 1993 and 1996 Phase I RFI	None; previously approved for no sampling (NMED 2006, 095460)
	AOC 01-003(c)	Surface disposal site does not appear to exist	1988 Site walkover 1996 Phase I RFI	None; previously approved for no sampling (NMED 2006, 095460)
	SWMU 01-003(d)	Surface disposal site: "Can Dump Site," empty paint and solvent cans from paint and carpentry operations	1992 Phase I RFI 1995 VCA	Sampled
	AOC 01-007(k)	Soil contamination area near buildings U and W (physics laboratories)	1993 Phase I RFI	Sampled
TA-03				
	AOC 03-008(a)	Former firing site	None	None; previously approved for no sampling (NMED 2006, 095460)
	SWMU 03-009(j)	Surface disposal site for construction debris	None	Sampled
03-038(a)-00 Tanks and/or Associated Equipment	SWMU 03-038(a) SWMU 03-038(b)	Acid-neutralizing and pumping building Steel 28,500-gal acid waste holding tank	1975–1976 Soil excavated 1982 Tanks removed	Sampled
	SWMU 03-055(c)	Outfall: previously served fire station floor drains; currently handles storm water from roads and parking lots	1992 Drainage channel sampled	Sampled

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC	Site Description	Investigation(s) Prior to 2008	Investigation Conducted in 2008–2009
TA-32				
	SWMU 32-001	Incinerator (former location), received combustible waste from a medical research facility	1993 Phase I RFI 1996 Phase II RFI (VCA)	Sampled
	SWMU 32-002(a)	Septic tank (former location), drainlines; served medical research facility laboratory from 1944 to 1953	1993 Phase I RFI 1996 Phase II RFI (VCA)	Sampled
	SWMU 32-002(b)	Septic system; served medical research facility laboratory from 1944 to 1953	1988 tank content sampled 1993 Phase I RFI 1996 Phase II RFI (VCA)	Sampled
	AOC 32-003	Transformer site (former location) consisting of three transformers located 19.5 ft above ground	1993 Phase I RFI 1996 Phase II RFI (VCA)	Sampled
	AOC 32-004	Drainline and outfall from a former office building with a radiation source vault	1996 Phase II RFI (VCA)	Sampled
TA-41				
	SWMU 41-001	Septic system, received sanitary waste from a guardhouse	1995 Phase I RFI 2000 Radiation walkover survey	Sampled
41-002(a)-99 TA-41 Sewage Treatment Plant	SWMU 41-002(a) SWMU 41-002(b) SWMU 41-002(c)	Imhoff tank Chlorine contact tank Sludge drying bed	1955 Influent and effluent sampled 1995 Phase I RFI 2000 Radiation walkover survey	None; previously approved for deferred action (NMED 2006, 095460)
	AOC 41-003	Sump, received effluent from floor and sink drains, stormwater, and rinse water	1995 Phase I RFI 2000 Radiation walkover survey	None; previously approved for deferred action (NMED 2006, 095460)
	AOC C-41-004	Storm drain system surrounding building 41-4 (laboratory)	1995 Phase I RFI	None; previously approved for deferred action (NMED 2006, 095460)
TA-43				
	SWMU 43-001(a1)	Waste lines (pre-1981), served HRL	None	None; previously approved for deferred action (NMED 2006, 095460)

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC	Site Description	Investigation(s) Prior to 2008	Investigation Conducted in 2008–2009
	AOC 43-001(a2)	Waste lines (post-1981), served HRL	None	None; previously approved for deferred action (NMED 2006, 095460)
	AOC 43-001(b2)	Outfall; previously received effluent from floor and roof drains and blow-down from an evaporative cooler	None	Sampled
	SWMU 43-002	Incinerator for wastes generated by health research activities	None	None; previously approved for deferred action (NMED 2006, 095460)
	AOC C-43-001	Storm drain outfall from the HRL loading dock; may also receive overflow from a sanitary sewer lift station	None	Sampled
TA-61				
	SWMU 61-007	Transformer site: systematic leak; PCB-only site	1989 Site cleaned up under the Toxic Substance Control Act	Sampled

Note: Shading denotes consolidated unit.

Table 3.1-1
Soil Screening Levels and Screening Action Levels
for COPCs in the Upper Los Alamos Aggregate Area

Analyte Name	Residential Risk	Industrial Risk	Construction Worker Risk	Recreational Risk
Inorganic Chemicals (mg/kg)				
Aluminum	77800	100000	14400	100000
Antimony	31.3	454	124	317
Arsenic	3.9	17.7	85.2	27.7
Barium	15600	100000	60200	100000
Beryllium	156	2250	56.2	1580
Cadmium	39	564	154	392
Chromium	2800	14000	na*	14300
Cobalt	1520	20500	61	15700
Copper	3130	45400	12400	31700
Cyanide (Total)	1220	13700	4760	7970
Iron	23500	100000	92900	100000
Lead	400	800	800	560
Manganese	3590	48400	150	36900
Mercury	23	310	na	238
Nickel	1560	22700	6190	15800
Nitrate	100000	100000	100000	100000
Perchlorate	55	720	na	79.2
Selenium	391	5680	1550	3960
Silver	391	5680	1550	3960
Thallium	5.16	74.9	20.4	52.3
Vanadium	78.2	1140	310	792
Zinc	23500	100000	92900	100000
Organic Chemicals (mg/kg)				
Acenaphthene	3730	33500	14100	47500
Acetone	28100	100000	98500	100000
Anthracene	22000	100000	86000	100000
Aroclor-1248	1.12	8.26	4.28	10.5
Aroclor-1254	1.12	8.26	4.28	6.65
Aroclor-1260	1.12	8.26	4.28	10.5
Benzene	10.3	25.8	174	224
Benzo(a)anthracene	6.21	23.4	212	30.1
Benzo(a)pyrene	0.621	2.34	21.2	3.01
Benzo(b)fluoranthene	6.21	23.4	212	30.1
Benzo(k)fluoranthene	62.1	234	2120	301
Benzoic Acid	100000	100000	na	100000

Table 3.1-1 (continued)

Analyte Name	Residential Risk	Industrial Risk	Construction Worker Risk	Recreational Risk
Bis(2-ethylhexyl)phthalate	347	1370	4660	1830
Bromobenzene	37	137	121	245
Bromomethane	8.51	32.8	28.2	228
Butanone[2-]	31800	48700	48700	48700
Butylbenzene[n-]	62.1	62.1	62.1	62.1
Butylbenzene[sec-]	60.6	60.6	60.6	60.6
Butylbenzene[tert-]	106	106	106	106
Butylbenzylphthalate	2600	9100	na	79700
Carbazole	240	960	na	1280
Carbon Disulfide	460	460	460	460
Chloroform	4	9.59	216	102
Chloromethane	21.8	53.4	284	510
Chlorotoluene[2-]	202	202	202	202
Chrysene	615	2310	21200	3010
Di-n-butylphthalate	6110	68400	23300	39900
Dibenz(a,h)anthracene	0.621	2.34	21.2	3.01
Dibenzofuran	142	1620	552	1580
Dichlorobenzene[1,2-]	37.4	37.4	37.4	37.4
Dichlorobenzene[1,3-]	32.6	37.4	37.4	37.4
Dichlorodifluoromethane	161	211	211	211
Dichloroethene[cis-1,2]	11400	76.5	254	1980
Ethylbenzene	128	128	128	128
Fluoranthene	2290	24400	8730	13900
Fluorene	2660	26500	10200	31700
Hexachlorobenzene	3.04	12	102	16
Indeno(1,2,3-cd)pyrene	6.21	23.4	212	30.1
Isopropylbenzene	271	389	389	389
Methylene Chloride	182	490	2630	2630
Naphthalene	79.5	300	262	15800
Pentachlorophenol	29.8	100	1020	117
Phenanthrene	1830	20500	6990	12000
Propylbenzene[1-]	62.1	62.1	62.1	62.1
Pyrene	2290	30900	9010	23800
Styrene	100	100	100	100
Tetrachloroethene	12.5	31.6	134	134
Toluene	252	252	252	252
Trichloro-1,2,2-trifluoroethane[1,1,2-]	3280	3280	3280	3280
Trichlorobenzene[1,2,4-]	69.3	269	230	855

Table 3.1-1 (continued)

Analyte Name	Residential Risk	Industrial Risk	Construction Worker Risk	Recreational Risk
Trichloroethene	0.638	253	33.6	15.1
Trichlorofluoromethane	588	983	983	983
Trimethylbenzene[1,2,4-]	58	213	190	39600
Trimethylbenzene[1,3,5-]	24.8	69.2	69.2	69.2
2,3,7,8-TCDD equivalent	4.14E-05	2.04E-04	2.84E-04	2.77E-04
Vinyl Chloride	2.25	14	182	29.7
Xylene (Total)	82	82	82	82
Xylene[1,2-]	82	82	82	82
Xylene[1,3-]	99.5	99.5	99.5	99.5
Xylene[1,3-]+Xylene[1,4-]	82	82	82	82
Radionuclides (pCi/g)				
Americium-241	30	180	34	280
Cesium-134	2.4	9.7	7.7	87
Cesium-137	5.6	23	18	210
Plutonium-238	37	240	40	330
Plutonium-239/240	33	210	36	300
Strontium-90	5.7	1900	800	5600
Tritium	750	440000	320000	5100000
Uranium-234	170	1500	220	3200
Uranium-235	17	87	43	520
Uranium-238	86	430	160	2100

*na = Not available.

Table 4.1-1
Surveyed Coordinates for Locations Sampled in 2008–2009

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
00-017	00-10125	1619834.396	1776320.198
00-017	00-10126	1619909.555	1776365.202
00-017	00-10127	1619858.247	1776334.08
00-017	00-10128	1619808.977	1776304.682
00-017	00-10129	1619882.048	1776348.572
00-017	00-10130	1619933.439	1776379.657
00-017	00-10131	1619959.06	1776395.133
00-017	00-10132	1619669.697	1776215.224
00-017	00-10133	1619703.008	1776240.25
00-017	00-10134	1619692.085	1776232.712
00-017	00-10135	1619647.279	1776197.582
00-017	00-10136	1619622.306	1776178.26
00-017	00-10137	1619595.606	1776157.082
00-017	00-10138	1619577.138	1776143.378
00-017	00-10139	1619554.652	1776126.303
00-017	00-10140	1619527.876	1776104.811
00-017	00-10141	1619142.918	1775614.852
00-017	00-10143	1619175.339	1775826.5
00-017	00-10144	1619172.348	1775796.284
00-017	00-10145	1619116.839	1775363.827
00-017	00-10146	1619113.439	1775343.162
00-017	00-10179	1619118.461	1775343.25
00-017	00-10180	1619108.327	1775343.827
00-017	00-10181	1619171.333	1775787.894
00-017	00-10182	1619170.029	1775776.883
00-017	00-10183	1619165.822	1775786.641
00-017	00-10184	1619175.301	1775787.297
00-017	00-604247	1619119.05	1775357.96
00-017	00-604248	1619136.26	1775505.34
00-017	00-604249	1619152.4	1775620.45
00-017	00-604250	1619164.23	1775717.27
00-017	00-604251	1619177.14	1775814.09
00-031(a)	00-604725	1628018.765	1775945.866
00-031(a)	00-604726	1628019.953	1775969.527
00-031(a)	00-604727	1628023.288	1775989.55
00-031(a)	00-604728	1628036.089	1775964.081
00-031(a)	00-604729	1628058.059	1775945.981
01-001(a)	00-603748	1623247.01	1775364.9

Table 4.1-1 (continued)

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
01-001(a)	00-603749	1623343.13	1775369.18
01-001(a)	00-603750	1623329.29	1775353.21
01-001(a)	00-603751	1623332.56	1775322.06
01-001(a)	00-603752	1623335.91	1775297.7
01-001(a)	00-603753	1623327.39	1775295.27
01-001(a)	00-603754	1623344.44	1775301.36
01-001(a)	00-603761	1623334.69	1775305.62
01-001(b)	00-603762	1623037.36	1775463.8
01-001(b)	00-603763	1623127.94	1775425.68
01-001(b)	00-603764	1622960.9	1775399.68
01-001(b)	00-603765	1622947.67	1775388.69
01-001(b)	00-603766	1622943.64	1775381.74
01-001(b)	00-603767	1622936.69	1775387.57
01-001(b)	00-603768	1622952.16	1775378.38
01-001(b)	00-603769	1622919.689	1775359.691
01-001(b)	00-603770	1622931.169	1775350.025
01-001(b)	00-603771	1622927.275	1775351.686
01-001(c)	00-603775	1624300.72	1775129.91
01-001(c)	00-603777	1624249.3	1775070.26
01-001(c)	00-603778	1624241	1775064.22
01-001(c)	00-603779	1624235.38	1775070.9
01-001(c)	00-603780	1624249.43	1775061.06
01-001(d)	00-603799	1624421.81	1775241.52
01-001(d)	00-603800	1624593.62	1775017.16
01-001(d)	00-603801	1624582.51	1775007.05
01-001(d)	00-603802	1624596.66	1775031.31
01-001(d)	00-603803	1624508.73	1774955.51
01-001(d)	00-603804	1624603.73	1774978.75
01-001(d)	00-603805	1624648.2	1774995.93
01-001(d)	00-603806	1624532.98	1774887.79
01-001(d)	00-603807	1624683.57	1774942.37
01-001(d)	00-603808	1624551.18	1774845.35
01-001(d)	00-603809	1624644.16	1774861.52
01-001(d)	00-603810	1624716.92	1774879.71
01-001(d)	00-603811	1624559.26	1774761.46
01-001(d)	00-603812	1624661.34	1774761.46
01-001(d)	00-603813	1624736.12	1774762.47
01-001(d)	00-603814	1624554.21	1774685.67
01-001(d)	00-603815	1624662.35	1774686.68
01-001(d)	00-603816	1624738.15	1774682.63

Table 4.1-1 (continued)

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
01-001(d)	00-603817	1624543.09	1774612.9
01-001(d)	00-603818	1624645.17	1774608.86
01-001(d)	00-603819	1624711.87	1774596.73
01-001(d)	00-603820	1624622.93	1774923.17
01-001(d)	00-603821	1624585.07	1775024.9
01-001(e)	00-603822	1623507.56	1775694.36
01-001(e)	00-603823	1623545.79	1775637.23
01-001(f)	00-603824	1623126.99	1775468.87
01-001(f)	00-603825	1623014.22	1775693.06
01-001(f)	00-603826	1622889.18	1775681.88
01-001(f)	00-603827	1622892.01	1775693.2
01-001(f)	00-603828	1622887.05	1775671.98
01-001(f)	00-603829	1622850.97	1775673.4
01-001(f)	00-603830	1622858.05	1775700.28
01-001(f)	00-603831	1622853.8	1775686.84
01-001(f)	00-603832	1622832.58	1775722.21
01-001(f)	00-603833	1622835.41	1775736.36
01-001(f)	00-603834	1622817.72	1775710.18
01-001(f)	00-603835	1622810.65	1775733.53
01-001(f)	00-603836	1622775.28	1775714.43
01-001(f)	00-603837	1622727.88	1775687.54
01-001(f)	00-603838	1622690.38	1775674.1
01-001(f)	00-603839	1622638.74	1775635.9
01-001(f)	00-603840	1622592.75	1775596.28
01-001(f)	00-603841	1622559.5	1775553.84
01-001(f)	00-603842	1622527.67	1775507.14
01-001(f)	00-603843	1622512.1	1775471.77
01-001(f)	00-603844	1622909.52	1775683.7
01-001(g)	00-603845	1623885.47	1775193.86
01-001(g)	00-603846	1623860.51	1775139.74
01-001(g)	00-603847	1623853.41	1775143.96
01-001(g)	00-603848	1623869.53	1775137.63
01-001(g)	00-603849	1623862.87	1775146.99
01-001(o)	00-603850	1623853.41	1775506.36
01-001(o)	00-603851	1623695.27	1775440.76
01-001(o)	00-603852	1623697.9	1775427.6
01-001(o)	00-603853	1623706.24	1775417.51
01-001(o)	00-603854	1623695.27	1775341.62
01-001(o)	00-603855	1623681.23	1775339.86
01-001(o)	00-603856	1623684.3	1775353.9

Table 4.1-1 (continued)

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
01-001(o)	00-603857	1623685.18	1775325.82
01-001(o)	00-603858	1623712.1	1775437.79
01-001(s)	03-603859	1622672.93	1776342.31
01-001(s)	03-603860	1622866.58	1776300.01
01-001(s)	03-603861	1623233.42	1776197.95
01-001(s)	03-603862	1623431.17	1776113.72
01-001(s)	03-603863	1623667.69	1776037.39
01-001(s)	03-603864	1623690.11	1775860.38
01-001(s)	03-603865	1623855.45	1776024.99
01-001(s)	03-603866	1623797.17	1775929.07
01-001(s)	03-603867	1623957.7	1775836.06
01-001(s)	03-603868	1624163.44	1775723.91
01-001(s)	03-603869	1624316.04	1775701.44
01-001(s)	03-603870	1624185.05	1775465.87
01-001(s)	03-603871	1624434.67	1775352.37
01-001(t)	00-603872	1624535.02	1775862.58
01-001(t)	00-603873	1624678.81	1775730.82
01-001(t)	00-603874	1624878.31	1775733.24
01-001(t)	00-603875	1624991.44	1775763.87
01-001(t)	00-603876	1624876.89	1775658.21
01-001(t)	00-603877	1624614.43	1775553.31
01-001(t)	00-603878	1624478.23	1775626.34
01-001(t)	00-603879	1624579.01	1775422.1
01-001(t)	00-603880	1624407.93	1775516.72
01-001(t)	00-603881	1624387.91	1775471.44
01-001(u)	00-603882	1622989.52	1776195.27
01-001(u)	00-603883	1622952.37	1776136.56
01-002	00-603884	1623143.3	1776071.77
01-002	00-603885	1623400.51	1776089.99
01-002	00-603886	1623520.12	1776138.19
01-002	00-603887	1623723.9	1776013.48
01-002	00-603888	1623729.63	1775891.1
01-002	00-603889	1623569.73	1775865.23
01-002	00-603890	1623569.66	1775809.25
01-002	00-603891	1623642.82	1775776.64
01-002	00-603892	1623792.99	1775905.56
01-002	00-603893	1623994.16	1775790.63
01-002	00-603894	1624075.98	1775701
01-002	00-603895	1624113.09	1775534.85
01-002	00-603896	1623974.09	1775451.66

Table 4.1-1 (continued)

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
01-002	00-603897	1624080.02	1775444.8
01-002	00-603898	1624208.72	1775472.08
01-002	00-603899	1624362.87	1775389.41
01-002	00-603900	1624141.81	1775378.17
01-002	00-603901	1624202.32	1775270.08
01-002	00-604530	1623758.2	1775184.7
01-002	00-604531	1624036.2	1775684
01-002	01-04226	1623705.93	1775815.84
01-002	01-04227	1623708.64	1775775.61
01-003(a)	00-603902	1623624.47	1775520.88
01-003(a)	00-603903	1623607.04	1775474.4
01-003(a)	00-603904	1623612.02	1775426.27
01-003(a)	00-603905	1623599.57	1775384.78
01-003(a)	00-603906	1623630.28	1775379.8
01-003(a)	00-603907	1623582.15	1775349.92
01-003(a)	00-603908	1623596.25	1775339.13
01-003(a)	00-603909	1623563.89	1775306.77
01-003(a)	00-603910	1623548.12	1775269.42
01-003(a)	00-603911	1623529.03	1775225.44
01-003(a)	00-603912	1623500.82	1775183.94
01-003(a)	00-603913	1623487.54	1775137.47
01-003(a)	00-603914	1623475.09	1775081.86
01-003(a)	00-603915	1623457.66	1775037.88
01-003(a)	00-603916	1623438.57	1774993.89
01-003(a)	00-603917	1623409.53	1774958.21
01-003(a)	00-603918	1623664.31	1775487.68
01-003(a)	00-603919	1623646.05	1775446.19
01-003(b)	00-604022	1624043.389	1775156.505
01-003(b)	00-604023	1624048.963	1775177.042
01-003(b)	00-604024	1624042.018	1775129.297
01-003(b)	00-604025	1624069.401	1775149.43
01-003(b)	00-604026	1624028.199	1775150.864
01-003(d)	00-604027	1625036.33	1774843.53
01-003(d)	00-604028	1625087.34	1774831.59
01-003(d)	00-604029	1625141.6	1774824.36
01-003(d)	00-604030	1625016.07	1774810.25
01-003(d)	00-604031	1625068.53	1774794.69
01-003(d)	00-604032	1625136.54	1774784.93
01-003(e)	00-604033	1624719.17	1775080.07
01-003(e)	00-604034	1624788.77	1775089.65

Table 4.1-1 (continued)

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
01-003(e)	00-604035	1624865.93	1775079.56
01-003(e)	00-604036	1624738.84	1775038.71
01-003(e)	00-604037	1624786.75	1775045.27
01-003(e)	00-604038	1624838.7	1775037.7
01-003(e)	00-604219	1624802.45	1775019.68
01-003(e)	00-604220	1624770.86	1774950.8
01-003(e)	00-604221	1624760.2	1774917.99
01-003(e)	00-604222	1624752.46	1774892.34
01-006(a)	00-604039	1623862.51	1775188.13
01-006(a)	00-604040	1623849.42	1775190.14
01-006(a)	00-604041	1623873.58	1775188.63
01-006(a)	00-604042	1623842.88	1775174.54
01-006(a)	00-604043	1623852.44	1775159.94
01-006(a)	00-604044	1623891.2	1775107.09
01-006(a)	00-604045	1623938.51	1775079.91
01-006(a)	00-604046	1623969.22	1775071.86
01-006(a)	00-604047	1623865.17	1775200.76
01-006(b)	00-604223	1624160.86	1775298.78
01-006(b)	00-604224	1624116.39	1775175.51
01-006(b)	00-604225	1624098.26	1775180.28
01-006(b)	00-604226	1624129.76	1775177.42
01-006(b)	00-604237	1624113.98	1775186.98
01-006(c)	00-603783	1624247.32	1775124.29
01-006(d)	00-603784	1624298.75	1775085.47
01-006(e)	00-603872	1624535.02	1775862.58
01-006(e)	00-603874	1624878.31	1775733.24
01-006(e)	00-603876	1624876.89	1775658.21
01-006(g)	00-604048	1623914.65	1775187.41
01-006(g)	00-604049	1623907.97	1775190.75
01-006(g)	00-604050	1623923.01	1775186.07
01-006(g)	00-604051	1623918.61	1775197.21
01-006(h)	00-603799	1624421.81	1775241.52
01-006(h)	00-603800	1624593.62	1775017.16
01-006(h)	00-603801	1624582.51	1775007.05
01-006(h)	00-603802	1624596.66	1775031.31
01-006(h)	00-603803	1624508.73	1774955.51
01-006(h)	00-603804	1624603.73	1774978.75
01-006(h)	00-603805	1624648.2	1774995.93
01-006(h)	00-603806	1624532.98	1774887.79
01-006(h)	00-603807	1624683.57	1774942.37

Table 4.1-1 (continued)

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
01-006(h)	00-603808	1624551.18	1774845.35
01-006(h)	00-603809	1624644.16	1774861.52
01-006(h)	00-603810	1624716.92	1774879.71
01-006(h)	00-603811	1624559.26	1774761.46
01-006(h)	00-603812	1624661.34	1774761.46
01-006(h)	00-603813	1624736.12	1774762.47
01-006(h)	00-603814	1624554.21	1774685.67
01-006(h)	00-603815	1624662.35	1774686.68
01-006(h)	00-603816	1624738.15	1774682.63
01-006(h)	00-603817	1624543.09	1774612.9
01-006(h)	00-603818	1624645.17	1774608.86
01-006(h)	00-603819	1624711.87	1774596.73
01-006(h)	00-603820	1624622.93	1774923.17
01-006(h)	00-603821	1624585.07	1775024.9
01-006(n)	00-604227	1624279.61	1775206.05
01-006(n)	00-604228	1624270.06	1775216.55
01-006(n)	00-604229	1624292.02	1775197.46
01-006(n)	00-604238	1624290.11	1775211.78
01-006(o)	00-604052	1623670.68	1775458.4
01-006(o)	00-604053	1623661.56	1775467.52
01-006(o)	00-604054	1623679.8	1775450.93
01-006(o)	00-604055	1623678.14	1775467.52
01-007(a)	00-603900	1624141.81	1775378.17
01-007(a)	00-603901	1624202.32	1775270.08
01-007(a)	00-604230	1624189.89	1775119.2
01-007(a)	00-604231	1624078.21	1775038.07
01-007(a)	00-604232	1624019.04	1774998.93
01-007(a)	00-604233	1623972.27	1774974.12
01-007(a)	00-604234	1623922.63	1774905.39
01-007(a)	00-604235	1623892.09	1774854.81
01-007(a)	00-604236	1623878.73	1774794.67
01-007(a)	00-604239	1624271.02	1775353.04
01-007(a)	00-604240	1624302.52	1775292.91
01-007(b)	00-603781	1624267.35	1775162.59
01-007(b)	00-603782	1624341.47	1775088.11
01-007(b)	00-603785	1624209.73	1775087.41
01-007(b)	00-603786	1624293.7	1775030.85
01-007(b)	00-603787	1624181.98	1775055.44
01-007(b)	00-603788	1624229.41	1775031.55
01-007(b)	00-603789	1624279.29	1774999.23

Table 4.1-1 (continued)

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
01-007(b)	00-603790	1624161.61	1775015.74
01-007(b)	00-603791	1624213.25	1774985.53
01-007(b)	00-603792	1624263.13	1774968.32
01-007(b)	00-603793	1624141.93	1774978.5
01-007(b)	00-603794	1624210.44	1774945.13
01-007(b)	00-603795	1624264.89	1774919.49
01-007(b)	00-603796	1624118.4	1774943.37
01-007(b)	00-603797	1624183.04	1774922.3
01-007(b)	00-603798	1624251.89	1774885.76
01-007(c)	00-603895	1624113.09	1775534.85
01-007(c)	00-603897	1624080.02	1775444.8
01-007(c)	00-603898	1624208.72	1775472.08
01-007(c)	00-603900	1624141.81	1775378.17
01-007(d)	00-604241	1623852.95	1775587.75
01-007(d)	00-604242	1623989.83	1775658.16
01-007(d)	00-604243	1623995.34	1775582.24
01-007(e)	00-604244	1623506.39	1775739.06
01-007(e)	00-604245	1623434.17	1775802.93
01-007(j)	00-604246	1623407.93	1775931.79
01-007(k)	00-603879	1624579.01	1775422.1
01-007(k)	00-603880	1624407.93	1775516.72
01-007(k)	00-603881	1624387.91	1775471.44
03-009(j)	00-604252	1616732.82	1773935.49
03-009(j)	00-604253	1616779.4	1773976.06
03-038(a,b)	00-604254	1619048.77	1775123.66
03-038(a,b)	00-604255	1619068.8	1775091.77
03-038(a,b)	00-604256	1619101.92	1775109.35
03-038(a,b)	00-604257	1619077.8	1775117.94
03-038(a,b)	00-604258	1619083.11	1775139.19
03-038(a,b)	00-604259	1619088.43	1775173.12
03-055(c)	03-603243	1618590.152	1774911.87
03-055(c)	03-603245	1618585.999	1774930.077
03-055(c)	03-603247	1618587.369	1774922.463
03-055(c)	03-603248	1618589.026	1774965.727
03-055(c)	03-603250	1618600.111	1774995.537
03-055(c)	03-603254	1618627.137	1775015.505
03-055(c)	03-603255	1618644.978	1775042.682
03-055(c)	03-603256	1618642.114	1775075.923
03-055(c)	03-603257	1618641.681	1775115.307
03-055(c)	03-603258	1618595.903	1774984.999

Table 4.1-1 (continued)

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
32-001	00-603575	1627156.82	1774979.71
32-001	00-603576	1627165.88	1774968.09
32-001	00-603577	1627155.64	1774960.42
32-001	00-603578	1627146.59	1774969.08
32-001	00-603579	1627155.96	1774969.61
32-001	32-06446	1627160.79	1774966.625
32-001	32-06447	1627156.375	1774964.396
32-002(a)	00-603580	1627113.76	1774946.83
32-002(a)	00-603581	1627111.09	1774898.27
32-002(a)	00-603582	1627111.17	1774877.37
32-002(a)	00-603583	1627110.45	1774827.97
32-002(a)	00-603584	1627111.04	1774766.05
32-002(a)	00-603585	1627111.89	1774771.97
32-002(a)	00-603586	1627115.14	1774766.11
32-002(a)	00-603587	1627111.95	1774761.36
32-002(a)	00-603588	1627106.74	1774766.11
32-002(a)	32-06367	1627114.405	1774922.995
32-002(a)	32-06368	1627113.974	1774898.533
32-002(a)	32-06369	1627113.608	1774877.415
32-002(a)	32-06370	1627112.381	1774852.225
32-002(a)	32-06371	1627112.78	1774826.754
32-002(a)	32-06372	1627115.846	1774934.714
32-002(a)	32-06373	1627117.01	1774946.869
32-002(a)	32-06374	1627101.144	1774804.254
32-002(a)	32-06375	1627116.405	1774949.853
32-002(a)	32-06380	1627095.423	1774935.298
32-002(b)	00-603589	1627017.55	1774882.32
32-002(b)	00-603590	1627031.87	1774865.95
32-002(b)	00-603591	1627051.92	1774847.94
32-002(b)	00-603592	1627070.75	1774825.85
32-002(b)	00-603593	1627102.67	1774717.4
32-002(b)	00-603594	1627101.03	1774777.96
32-002(b)	00-603595	1627101.03	1774790.65
32-002(b)	00-603596	1627110.85	1774777.96
32-002(b)	00-603597	1627101.85	1774771.42
32-002(b)	00-603598	1627093.66	1774778.37
32-002(b)	00-603599	1626995.04	1774326.45
32-002(b)	32-06312	1627075.127	1774696.058
32-002(b)	32-06313	1627073.062	1774675.709
32-002(b)	32-06314	1627096.787	1774669.406

Table 4.1-1 (continued)

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
32-002(b)	32-06315	1627076.021	1774635.553
32-002(b)	32-06323	1627057.352	1774487.639
32-002(b)	32-06325	1627013.175	1774372.653
32-002(b)	32-06342	1627098.002	1774782.682
32-002(b)	32-06344	1627102.408	1774775.592
32-002(b)	32-06353	1627111.798	1774733.586
32-002(b)	32-06357	1627069.901	1774742.062
32-002(b)	32-06358	1627044.888	1774679.036
32-002(b)	32-06365	1627009.765	1774881.858
32-002(b)	32-06366	1627027.991	1774863.252
32-002(b)	32-06377	1627046.59	1774845.894
32-003	00-603600	1627059.78	1774839.89
32-003	00-603601	1627078.05	1774819.12
32-003	00-603602	1627058.53	1774797.94
32-003	00-603603	1627039.43	1774821.2
32-003	00-603604	1627041.5	1774843.63
32-003	00-603605	1627044.41	1774836.15
32-003	00-603606	1627046.9	1774830.34
32-003	00-603607	1627063.52	1774834.49
32-003	00-603608	1627051.89	1774819.12
32-003	00-603609	1627053.96	1774812.89
32-003	00-603610	1627070.99	1774816.63
32-003	00-603611	1627067.67	1774809.57
32-004	00-603612	1626781.45	1774918.63
32-004	32-06326	1626783.878	1774793.998
32-004	32-06331	1626783.298	1774699.858
32-004	32-06336	1626676.253	1774481.588
32-004	32-06338	1626792.681	1774825.996
32-004	32-06340	1626791.238	1774867.218
32-004	32-06363	1626796.864	1774894.58
32-004	32-06364	1626795.952	1774880.016
41-001	00-603725	1626462.28	1774456.7
41-001	00-603726	1626502.59	1774438.49
41-001	00-603727	1626536	1774423.29
41-001	00-603728	1626538.03	1774421.98
41-001	00-603729	1626540.06	1774420.68
41-001	00-603730	1626547.75	1774411.69
41-001	00-603731	1626542.96	1774406.9
41-001	00-603732	1626551.95	1774417.78
41-001	00-603733	1626564.68	1774399.42

Table 4.1-1 (continued)

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
41-001	00-603734	1626555.61	1774386.37
41-001	00-603735	1626574.2	1774412.83
41-001	00-603736	1626586.23	1774386.48
41-001	00-603737	1626578.96	1774319.79
41-001	00-603740	1626542.67	1774416.62
41-001	41-01007	1626529.873	1774409.862
41-001	41-01008	1626561.807	1774405.836
43-001(b2)	00-604264	1619325.42	1775948.94
43-001(b2)	00-604265	1619331.94	1775881.15
43-001(b2)	00-604266	1619340.41	1775857.68
43-001(b2)	00-604267	1619350.19	1775836.82
43-001(b2)	00-604268	1619336.5	1775805.54
43-001(b2)	00-604269	1619314.99	1775772.29
43-001(b2)	00-604270	1619318.9	1775737.74
43-001(b2)	00-604271	1619308.47	1775701.89
43-001(b2)	00-604272	1619292.82	1775668.65
43-001(b2)	00-604273	1619282.39	1775633.45
43-001(b2)	00-604276	1619329.33	1775968.5
C-43-001	00-604277	1619536.82	1775773.54
C-43-001	00-604278	1619529.25	1775777.7
C-43-001	00-604279	1619544.21	1775770.7
C-43-001	00-604286	1619540.61	1775782.63
C-43-001	00-604846	1619533.143	1775741.846
C-43-001	00-604847	1619544.093	1775741.067
C-43-001	00-604848	1619555.884	1775749.985
61-007	00-604287	1622579.43	1774377.48
61-007	00-604288	1622599.15	1774361.8
61-007	00-604289	1622574.55	1774361.29
61-007	00-604290	1622554.37	1774378.5
61-007	00-604291	1622577.62	1774369.11
61-007	00-604532	1622601.226	1774364.541

Table 4.4-1
Crosswalk of Proposed and Sampled Locations

SWMU or AOC	Proposed Location in Work Plan	Location ID
00-017	1	00-604247
00-017	2	00-604248
00-017	3	00-604249
00-017	4	00-604250
00-017	5	00-604251
00-031(a)	1	00-604725
00-031(a)	2	00-604726
00-031(a)	3	00-604727
00-031(a)	4	00-604728
00-031(a)	5	00-604729
01-001(a)	1	00-603748
01-001(a)	2	00-603749
01-001(a)	3	00-603750
01-001(a)	4	00-603751
01-001(a)	5	00-603761
01-001(a)	6	00-603752
01-001(a)	7	00-603753
01-001(a)	8	00-603754
01-001(b)	1	00-603762
01-001(b)	1	00-603763
01-001(b)	1	00-603764
01-001(b)	2	00-603763
01-001(b)	3	00-603764
01-001(b)	4	00-603765
01-001(b)	5	00-603766
01-001(b)	6	00-603767
01-001(b)	7	00-603768
01-001(b)	8	00-603769
01-001(b)	9	00-603770
01-001(b)	10	00-603771
01-001(d), 01-006(h)	1	00-603799
01-001(d), 01-006(h)	2	00-603821
01-001(d), 01-006(h)	3	00-603800
01-001(d), 01-006(h)	4	00-603801
01-001(d), 01-006(h)	5	00-603802
01-001(d), 01-006(h)	6	00-603803
01-001(d), 01-006(h)	7	00-603804
01-001(d), 01-006(h)	8	00-603805

Table 4.4-1 (continued)

SWMU or AOC	Proposed Location in Work Plan	Location ID
01-001(d), 01-006(h)	9	00-603806
01-001(d), 01-006(h)	10	00-603820
01-001(d), 01-006(h)	11	00-603807
01-001(d), 01-006(h)	12	00-603808
01-001(d), 01-006(h)	13	00-603809
01-001(d), 01-006(h)	14	00-603810
01-001(d), 01-006(h)	15	00-603811
01-001(d), 01-006(h)	16	00-603812
01-001(d), 01-006(h)	17	00-603813
01-001(d), 01-006(h)	18	00-603814
01-001(d), 01-006(h)	19	00-603815
01-001(d), 01-006(h)	20	00-603816
01-001(d), 01-006(h)	21	00-603817
01-001(d), 01-006(h)	22	00-603818
01-001(d), 01-006(h)	23	00-603819
01-001(e)	1	00-603822
01-001(e)	2	00-603823
01-001(f)	1	00-603824
01-001(f)	2	00-603825
01-001(f)	3	00-603844
01-001(f)	4	00-603826
01-001(f)	5	00-603827
01-001(f)	6	00-603828
01-001(f)	7	00-603831
01-001(f)	8	00-603830
01-001(f)	9	00-603829
01-001(f)	10	00-603832
01-001(f)	11	00-603833
01-001(f)	12	00-603834
01-001(f)	13	00-603835
01-001(f)	14	00-603836
01-001(f)	15	00-603837
01-001(f)	16	00-603838
01-001(f)	17	00-603839
01-001(f)	18	00-603840
01-001(f)	19	00-603841
01-001(f)	20	00-603842
01-001(f)	21	00-603843
01-001(g)	1	00-603845

Table 4.4-1 (continued)

SWMU or AOC	Proposed Location in Work Plan	Location ID
01-001(g)	2	00-603849
01-001(g)	3	00-603846
01-001(g)	4	00-603847
01-001(g)	5	00-603848
01-001(o)	1	00-603850
01-001(o)	2	00-603858
01-001(o)	3	00-603852
01-001(o)	4	00-603851
01-001(o)	5	00-603853
01-001(o)	6	00-603854
01-001(o)	7	00-603855
01-001(o)	8	00-603856
01-001(o)	9	00-603857
01-001(s)	1	03-603859
01-001(s)	2	03-603860
01-001(s)	3	03-603861
01-001(s)	4	03-603862
01-001(s)	5	03-603863
01-001(s)	6	03-603864
01-001(s)	7	03-603865
01-001(s)	8	03-603866
01-001(s)	9	03-603867
01-001(s)	10	03-603868
01-001(s)	11	03-603869
01-001(s)	12	03-603870
01-001(s)	13	03-603871
01-001(u)	1	00-603882
01-001(u)	2	00-603883
01-001(c), 01-006(c,d), 01-007(b)	1	00-603775
01-001(c), 01-006(c,d), 01-007(b)	2	Not collected (refusal)
01-001(c), 01-006(c,d), 01-007(b)	3	00-603777
01-001(c), 01-006(c,d), 01-007(b)	4	00-603778
01-001(c), 01-006(c,d), 01-007(b)	5	00-603779
01-001(c), 01-006(c,d), 01-007(b)	6	00-603780
01-001(c), 01-006(c,d), 01-007(b)	7	00-603781
01-001(c), 01-006(c,d), 01-007(b)	8	00-603782
01-001(c), 01-006(c,d), 01-007(b)	9	00-603783
01-001(c), 01-006(c,d), 01-007(b)	10	00-603784
01-001(c), 01-006(c,d), 01-007(b)	11	00-603785

Table 4.4-1 (continued)

SWMU or AOC	Proposed Location in Work Plan	Location ID
01-001(c), 01-006(c,d), 01-007(b)	12	00-603786
01-001(c), 01-006(c,d), 01-007(b)	13	00-603787
01-001(c), 01-006(c,d), 01-007(b)	14	00-603788
01-001(c), 01-006(c,d), 01-007(b)	15	00-603789
01-001(c), 01-006(c,d), 01-007(b)	16	00-603790
01-001(c), 01-006(c,d), 01-007(b)	17	00-603791
01-001(c), 01-006(c,d), 01-007(b)	18	00-603792
01-001(c), 01-006(c,d), 01-007(b)	19	00-603793
01-001(c), 01-006(c,d), 01-007(b)	20	00-603794
01-001(c), 01-006(c,d), 01-007(b)	21	00-603795
01-001(c), 01-006(c,d), 01-007(b)	22	00-603796
01-001(c), 01-006(c,d), 01-007(b)	23	00-603797
01-001(c), 01-006(c,d), 01-007(b)	24	00-603798
01-001(t), 01-006(e), 01-007(k)	1	00-603872
01-001(t), 01-006(e), 01-007(k)	2	00-603873
01-001(t), 01-006(e), 01-007(k)	3	00-603874
01-001(t), 01-006(e), 01-007(k)	4	00-603875
01-001(t), 01-006(e), 01-007(k)	5	00-603876
01-001(t), 01-006(e), 01-007(k)	6	00-603877
01-001(t), 01-006(e), 01-007(k)	6	00-607877
01-001(t), 01-006(e), 01-007(k)	7	00-603878
01-001(t), 01-006(e), 01-007(k)	8	00-603879
01-001(t), 01-006(e), 01-007(k)	9	00-603880
01-001(t), 01-006(e), 01-007(k)	10	00-603881
01-002, 01-007(c)	1	00-603884
01-002, 01-007(c)	2	00-603885
01-002, 01-007(c)	3	00-603886
01-002, 01-007(c)	4	00-603887
01-002, 01-007(c)	5	00-603888
01-002, 01-007(c)	6	00-603889
01-002, 01-007(c)	7	00-603890
01-002, 01-007(c)	8	00-603891
01-002, 01-007(c)	9	00-603892
01-002, 01-007(c)	10	00-603893
01-002, 01-007(c)	11	00-603894
01-002, 01-007(c)	12	00-603895
01-002, 01-007(c)	13	00-603896
01-002, 01-007(c)	14	00-603897
01-002, 01-007(c)	15	00-603898

Table 4.4-1 (continued)

SWMU or AOC	Proposed Location in Work Plan	Location ID
01-002, 01-007(c)	16	00-603899
01-002, 01-007(c)	17	00-603900
01-002, 01-007(c)	18	00-603901
01-002, 01-007(c)	Not proposed in work plan	00-604530
01-002, 01-007(c)	Not proposed in work plan	00-604531
01-003(a)	1	00-603902
01-003(a)	2	00-603918
01-003(a)	3	00-603903
01-003(a)	4	00-603919
01-003(a)	5	00-603904
01-003(a)	6	00-603905
01-003(a)	7	00-603906
01-003(a)	8	00-603907
01-003(a)	9	00-603908
01-003(a)	10	00-603909
01-003(a)	11	00-603910
01-003(a)	12	00-603911
01-003(a)	13	00-603912
01-003(a)	14	00-603913
01-003(a)	15	00-603914
01-003(a)	16	00-603915
01-003(a)	17	00-603916
01-003(a)	18	00-603917
01-003(b)	1	00-604022
01-003(b)	2	00-604023
01-003(b)	3	00-604024
01-003(b)	4	00-604025
01-003(b)	5	00-604026
01-003(d)	1	00-604027
01-003(d)	2	00-604028
01-003(d)	3	00-604029
01-003(d)	4	00-604030
01-003(d)	5	00-604031
01-003(d)	6	00-604032
01-003(e)	1	00-604033
01-003(e)	2	00-604034
01-003(e)	3	00-604035
01-003(e)	4	00-604036
01-003(e)	5	00-604037

Table 4.4-1 (continued)

SWMU or AOC	Proposed Location in Work Plan	Location ID
01-003(e)	6	00-604038
01-003(e)	7	00-604219
01-003(e)	8	00-604220
01-003(e)	9	00-604221
01-003(e)	10	00-604222
01-006(a)	1	00-604047
01-006(a)	2	00-604039
01-006(a)	3	00-604040
01-006(a)	4	00-604041
01-006(a)	5	00-604042
01-006(a)	6	00-604043
01-006(a)	7	00-604044
01-006(a)	8	00-604045
01-006(a)	9	00-604046
01-006(g)	1	00-604051
01-006(g)	2	00-604048
01-006(g)	3	00-604049
01-006(g)	4	00-604050
01-006(o)	1	00-604055
01-006(o)	2	00-604052
01-006(o)	3	00-604053
01-006(o)	4	00-604054
01-007(d)	1	00-604241
01-007(d)	2	00-604242
01-007(d)	3	00-604243
01-007(e)	1	00-604244
01-007(e)	2	00-604245
01-007(j)	1	00-604246
01-007a, 01-006(b,n)	1	00-604239
01-007a, 01-006(b,n)	2	00-604240
01-007a, 01-006(b,n)	3	00-604223
01-007a, 01-006(b,n)	4	00-604237
01-007a, 01-006(b,n)	5	00-604224
01-007a, 01-006(b,n)	6	00-604225
01-007a, 01-006(b,n)	7	00-604226
01-007a, 01-006(b,n)	8	00-604238
01-007a, 01-006(b,n)	9	00-604227
01-007a, 01-006(b,n)	10	00-604228
01-007a, 01-006(b,n)	11	00-604229

Table 4.4-1 (continued)

SWMU or AOC	Proposed Location in Work Plan	Location ID
01-007a, 01-006(b,n)	12	00-604230
01-007a, 01-006(b,n)	13	00-604231
01-007a, 01-006(b,n)	14	00-604232
01-007a, 01-006(b,n)	15	00-604233
01-007a, 01-006(b,n)	16	00-604234
01-007a, 01-006(b,n)	17	00-604235
01-007a, 01-006(b,n)	18	00-604236
03-009(j)	1	00-604252
03-009(j)	2	00-604253
03-038(a,b)	1	00-604254
03-038(a,b)	2	00-604255
03-038(a,b)	3	00-604256
03-038(a,b)	4	00-604257
03-038(a,b)	5	00-604258
03-038(a,b)	6	00-604259
03-055(c)	1	03-603258
03-055(c)	2	03-603243
03-055(c)	3	Not collected
03-055(c)	4	Not collected
03-055(c)	Not proposed in work plan	03-603245
03-055(c)	Not proposed in work plan	03-603247
03-055(c)	Not proposed in work plan	03-603248
03-055(c)	Not proposed in work plan	03-603250
03-055(c)	Not proposed in work plan	03-603254
03-055(c)	Not proposed in work plan	03-603255
03-055(c)	Not proposed in work plan	03-603256
03-055(c)	Not proposed in work plan	03-603257
32-001	1	00-603575
32-001	2	00-603576
32-001	3	00-603577
32-001	4	00-603578
32-001	5	00-603579
32-002(a)	1	00-603580
32-002(a)	2	00-603581
32-002(a)	3	00-603582
32-002(a)	4	00-603583
32-002(a)	5	00-603584
32-002(a)	6	00-603585
32-002(a)	7	00-603586

Table 4.4-1 (continued)

SWMU or AOC	Proposed Location in Work Plan	Location ID
32-002(a)	8	00-603587
32-002(a)	9	00-603588
32-002(b)	1	00-603589
32-002(b)	2	00-603590
32-002(b)	3	00-603591
32-002(b)	4	00-603592
32-002(b)	5	00-603593
32-002(b)	6	00-603594
32-002(b)	7	00-603595
32-002(b)	8	00-603596
32-002(b)	9	00-603597
32-002(b)	10	00-603598
32-002(b)	11	00-603599
32-003	1	00-603600
32-003	2	00-603601
32-003	3	00-603602
32-003	4	00-603603
32-003	5	00-603604
32-003	6	00-603605
32-003	7	00-603606
32-003	8	00-603607
32-003	9	00-603608
32-003	10	00-603609
32-003	11	00-603610
32-003	12	00-603611
32-004	1	00-603612
41-001	1	00-603725
41-001	2	00-603726
41-001	3	00-603727
41-001	4	00-603728
41-001	5	00-603729
41-001	6	00-603740
41-001	7	00-603730
41-001	8	00-603731
41-001	9	00-603732
41-001	10	00-603733
41-001	11	00-603734
41-001	12	00-603735
41-001	13	00-603736

Table 4.4-1 (continued)

SWMU or AOC	Proposed Location in Work Plan	Location ID
41-001	14	00-603737
43-001(b2)	1	00-604276
43-001(b2)	2	00-604264
43-001(b2)	3	00-604265
43-001(b2)	4	00-604266
43-001(b2)	5	00-604267
43-001(b2)	6	00-604268
43-001(b2)	7	00-604269
43-001(b2)	8	00-604270
43-001(b2)	9	00-604271
43-001(b2)	10	00-604272
43-001(b2)	11	00-604273
C-43-001	1	00-604286
C-43-001	2	00-604277
C-43-001	3	00-604278
C-43-001	4	00-604279
C-43-001	7	00-604848
C-43-001	5	00-604846
C-43-001	5	00-604846
C-43-001	6	00-604847
C-43-001	6	00-604847
C-43-001	7	00-604848
61-007	1	00-604291
61-007	2	00-604287
61-007	3	00-604288
61-007	4	00-604289
61-007	5	00-604290
61-007	6	00-604532

Table 4.5-1
Field-Screening Results for Samples Collected in 2008–2009

SMWU or AOC	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/Gamma (dpm)
00-017	00-604247	0–1	RE00-09-310	0	23	2370
00-017	00-604247	2–3	RE00-09-311	0	73	2360
00-017	00-604247	4–5	RE00-09-312	0	77	2360
00-017	00-604248	1.25–2.25	RE00-09-313	0	47	2560
00-017	00-604248	3.25–4.25	RE00-09-314	0	89	2470
00-017	00-604248	5.25–6.25	RE00-09-315	0	56	2620
00-017	00-604249	2–3	RE00-09-316	0	41	2510
00-017	00-604249	4–5	RE00-09-317	0	59	2470
00-017	00-604249	6–7	RE00-09-318	0	41	2530
00-017	00-604250	1.5–2.5	RE00-09-319	0	59	2390
00-017	00-604250	3.5–4.5	RE00-09-320	0	65	2300
00-017	00-604250	5.5–6.5	RE00-09-321	0	47	2550
00-017	00-604251	2.75–3.75	RE00-09-322	0	77	2480
00-017	00-604251	4.75–5.75	RE00-09-323	0	23	2360
00-017	00-604251	6.75–7.75	RE00-09-324	0	71	2280
00-031(a)	00-604725	7–8	RE00-09-4250	0	75	1666
00-031(a)	00-604725	14–15	RE00-09-4251	0	75	1666
00-031(a)	00-604725	29–30	RE00-09-4252	0	75	1666
00-031(a)	00-604726	7–8	RE00-09-4256	0	75	1666
00-031(a)	00-604726	14–15	RE00-09-4257	0	75	1666
00-031(a)	00-604726	29–30	RE00-09-4258	0	75	1666
00-031(a)	00-604727	7–8	RE00-09-4260	0	75	1666
00-031(a)	00-604727	14–15	RE00-09-4261	0	75	1666
00-031(a)	00-604727	29–30	RE00-09-4262	0	75	1666
00-031(a)	00-604728	7–8	RE00-09-4265	159	75	1666
00-031(a)	00-604728	14–15	RE00-09-4266	4.3	75	1666
00-031(a)	00-604728	29–30	RE00-09-4267	0.1	75	1666
00-031(a)	00-604729	4–5	RE00-09-4270	60.1	75	1666
00-031(a)	00-604729	7–8	RE00-09-4271	0	75	1666
00-031(a)	00-604729	14–15	RE00-09-4272	0	75	1666
00-031(a)	00-604729	29–30	RE00-09-4273	0	75	1666
01-001(a)	00-603748	1.5–2.5	RE00-08-15637	0	41	2400
01-001(a)	00-603748	3.5–4.5	RE00-08-15638	0	95	2550
01-001(a)	00-603749	2–3	RE00-08-15639	0	65	2480
01-001(a)	00-603749	4–5	RE00-08-15640	0	47	2260
01-001(a)	00-603750	3.75–4.75	RE00-08-15641	0	35	2310
01-001(a)	00-603750	5.75–6.75	RE00-08-15642	0	95	2400

Table 4.5-1 (continued)

SMWU or AOC	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/Gamma (dpm)
01-001(a)	00-603751	6–7	RE00-08-15643	0	65	2650
01-001(a)	00-603751	10–11	RE00-08-15644	0	83	2620
01-001(a)	00-603752	0–1	RE00-08-15645	0	47	1958
01-001(a)	00-603752	3.75–4.75	RE00-08-15646	0	65	2210
01-001(a)	00-603753	0–1	RE00-08-15647	0	35	2360
01-001(a)	00-603753	1–2	RE00-08-15648	0	73	2520
01-001(a)	00-603754	0–1	RE00-08-15649	0	65	2220
01-001(a)	00-603754	2–3	RE00-08-15650	0	71	2480
01-001(a)	00-603761	0–1	RE00-08-15663	0	45	2150
01-001(a)	00-603761	1.5–2.5	RE00-08-15664	0	34	1970
01-001(a)	00-603761	4–5	RE00-08-15665	0	28	2450
01-001(b)	00-603762	2–3.5	RE00-08-15675	0	0	2060
01-001(b)	00-603762	4–5.5	RE00-08-15676	0	0	2060
01-001(b)	00-603762	6.5–7.5	RE00-08-15702	0	51.4	1726
01-001(b)	00-603762	9–10	RE00-08-15703	0	51.4	1726
01-001(b)	00-603763	1.25–2.25	RE00-08-15677	0	71	2500
01-001(b)	00-603763	3.25–4.25	RE00-08-15678	0	71	2310
01-001(b)	00-603764	1–2.25	RE00-08-15679	0	57	2370
01-001(b)	00-603764	5–6	RE00-08-15680	0	11	2590
01-001(b)	00-603765	0–1	RE00-08-15681	0	66	2640
01-001(b)	00-603765	1.5–2.5	RE00-08-15682	0	54	2710
01-001(b)	00-603765	4–5	RE00-08-15701	0	59	3000
01-001(b)	00-603766	0–1	RE00-08-15683	0	85	2640
01-001(b)	00-603766	1.5–2.5	RE00-08-15684	0	71	2440
01-001(b)	00-603767	0–1	RE00-08-15685	0	35	2270
01-001(b)	00-603767	1–2	RE00-08-15686	0	71	2450
01-001(b)	00-603768	0–1	RE00-08-15687	0	77	2670
01-001(b)	00-603768	1.5–2.5	RE00-08-15688	0	41	2800
01-001(b)	00-603769	0–1	RE00-08-15689	0	51.4	1726
01-001(b)	00-603769	1–2	RE00-08-15690	0	51.4	1726
01-001(b)	00-603770	0–1	RE00-08-15691	0	51.4	1726
01-001(b)	00-603770	1–2	RE00-08-15692	0	51.4	1726
01-001(b)	00-603771	0–1	RE00-08-15693	0	51.4	1726
01-001(b)	00-603771	1.25–2.25	RE00-08-15694	0	51.4	1726
01-001(d), 01-006(h)	00-603799	3.5–5	RE00-08-15788	0	79	2350
01-001(d), 01-006(h)	00-603799	6–7.5	RE00-08-15789	0	86	2470
01-001(d), 01-006(h)	00-603800	0–1	RE00-08-15790	0	40	2160
01-001(d), 01-006(h)	00-603800	2.75–3.75	RE00-08-15791	0	40	2160

Table 4.5-1 (continued)

SMWU or AOC	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/Gamma (dpm)
01-001(d), 01-006(h)	00-603801	0–1	RE00-08-15792	0	40	2160
01-001(d), 01-006(h)	00-603801	2.5–3.5	RE00-08-15793	0	40	2160
01-001(d), 01-006(h)	00-603802	0–1	RE00-08-15794	0	40	2160
01-001(d), 01-006(h)	00-603802	3.75–4.75	RE00-08-15795	0	40	2160
01-001(d), 01-006(h)	00-603803	0–1	RE00-08-15796	0	40	2160
01-001(d), 01-006(h)	00-603803	1–2	RE00-08-15797	0	40	2160
01-001(d), 01-006(h)	00-603804	0–1	RE00-08-15798	0	40	2160
01-001(d), 01-006(h)	00-603804	1–2	RE00-08-15799	0	40	2160
01-001(d), 01-006(h)	00-603805	0–1	RE00-08-15800	0	40	2160
01-001(d), 01-006(h)	00-603805	1–2	RE00-08-15801	0	40	2160
01-001(d), 01-006(h)	00-603806	0–1.25	RE00-08-15802	0	60	2730
01-001(d), 01-006(h)	00-603806	1.25–2.25	RE00-08-15803	0	60	2730
01-001(d), 01-006(h)	00-603807	0–1	RE00-08-15804	0	60	2730
01-001(d), 01-006(h)	00-603807	1–2	RE00-08-15805	0	60	2730
01-001(d), 01-006(h)	00-603808	0–1.25	RE00-08-15806	0	60	2730
01-001(d), 01-006(h)	00-603808	1.25–2.25	RE00-08-15807	0	60	2730
01-001(d), 01-006(h)	00-603809	0–1	RE00-08-15808	0	60	2730
01-001(d), 01-006(h)	00-603809	1–2	RE00-08-15809	0	60	2730
01-001(d), 01-006(h)	00-603810	0–1	RE00-08-15810	0	60	2730
01-001(d), 01-006(h)	00-603810	1.75–2.75	RE00-08-15811	0	60	2730
01-001(d), 01-006(h)	00-603811	0–1	RE00-08-15812	0	72	2720
01-001(d), 01-006(h)	00-603811	1.25–2.25	RE00-08-15813	0	72	2720
01-001(d), 01-006(h)	00-603812	0–1	RE00-08-15814	0	72	2720
01-001(d), 01-006(h)	00-603812	1–2	RE00-08-15815	0	72	2720
01-001(d), 01-006(h)	00-603813	0–1	RE00-08-15816	0	53	2860
01-001(d), 01-006(h)	00-603813	1–2	RE00-08-15817	0	53	2860
01-001(d), 01-006(h)	00-603814	0–1	RE00-08-15818	0	53	2860
01-001(d), 01-006(h)	00-603814	1–2	RE00-08-15819	0	72	2720
01-001(d), 01-006(h)	00-603815	0–1	RE00-08-15820	0	53	2860
01-001(d), 01-006(h)	00-603815	1.25–2.25	RE00-08-15821	0	53	2860
01-001(d), 01-006(h)	00-603816	0–1	RE00-08-15822	0	53	2860
01-001(d), 01-006(h)	00-603816	1–2	RE00-08-15823	0	53	2860
01-001(d), 01-006(h)	00-603817	0–1	RE00-08-15824	0	65	2670
01-001(d), 01-006(h)	00-603817	1.25–2.25	RE00-08-15825	0	65	2670
01-001(d), 01-006(h)	00-603818	0–1	RE00-08-15826	0	65	2670
01-001(d), 01-006(h)	00-603818	1–1.75	RE00-08-15827	0	65	2670
01-001(d), 01-006(h)	00-603819	0–1	RE00-08-15828	0	65	2670
01-001(d), 01-006(h)	00-603819	1–2	RE00-08-15829	0	53	2860

Table 4.5-1 (continued)

SMWU or AOC	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/Gamma (dpm)
01-001(d), 01-006(h)	00-603820	0–1.25	RE00-08-15830	0	60	2730
01-001(d), 01-006(h)	00-603820	1.5–2.5	RE00-08-15831	0	60	2730
01-001(d), 01-006(h)	00-603820	4–5	RE00-08-15832	0	60	2730
01-001(d), 01-006(h)	00-603821	0–1	RE00-08-15833	0	72	2720
01-001(d), 01-006(h)	00-603821	1.5–2.25	RE00-08-15834	0	72	2720
01-001(d), 01-006(h)	00-603821	4–5	RE00-08-15835	0	72	2720
01-001(e)	00-603822	2–3	RE00-08-15858	0	65	2650
01-001(e)	00-603822	4–5	RE00-08-15859	0	59	2680
01-001(e)	00-603823	1–2	RE00-08-15862	0	83	2640
01-001(e)	00-603823	3–4	RE00-08-15863	0	77	2130
01-001(f)	00-603824	1.25–2.25	RE00-08-16134	0	0	1613
01-001(f)	00-603824	3.25–4.25	RE00-08-16135	0	0	2000
01-001(f)	00-603825	4.75–5.75	RE00-08-16136	0	24.1	2610
01-001(f)	00-603825	6.75–7.75	RE00-08-16137	0	23.4	2250
01-001(f)	00-603826	0–1	RE00-08-16138	0	52	2770
01-001(f)	00-603826	1–2	RE00-08-16139	0	52	2770
01-001(f)	00-603827	0–1.25	RE00-08-16140	0	52	2770
01-001(f)	00-603827	1.25–2.25	RE00-08-16141	0	52	2770
01-001(f)	00-603828	0–1	RE00-08-16142	0	52	2770
01-001(f)	00-603828	1–2	RE00-08-16143	0	52	2770
01-001(f)	00-603829	0–1.25	RE00-08-16144	0	52	2770
01-001(f)	00-603829	1.25–2.25	RE00-08-16145	0	52	2770
01-001(f)	00-603830	0–1.25	RE00-08-16146	0	52	2770
01-001(f)	00-603830	1.25–3.25	RE00-08-16147	0	52	2770
01-001(f)	00-603831	0–1.25	RE00-08-16148	0	26	1917
01-001(f)	00-603831	1.25–2.25	RE00-08-16149	0	26	1917
01-001(f)	00-603832	0–1.25	RE00-08-16150	0	26	1917
01-001(f)	00-603832	1.25–2.5	RE00-08-16151	0	26	1917
01-001(f)	00-603833	0–1	RE00-08-16152	0	26	1917
01-001(f)	00-603833	1–2	RE00-08-16153	0	26	1917
01-001(f)	00-603834	0–1	RE00-08-16154	0	26	1917
01-001(f)	00-603834	1.25–2.25	RE00-08-16155	0	26	1917
01-001(f)	00-603835	0–1	RE00-08-16156	0	26	1917
01-001(f)	00-603835	1–2	RE00-08-16157	0	26	1917
01-001(f)	00-603836	0–1	RE00-08-16158	0	67	3000
01-001(f)	00-603836	1.75–2.75	RE00-08-16159	0	67	3000
01-001(f)	00-603837	0–1	RE00-08-16160	0	67	3000
01-001(f)	00-603837	2–3	RE00-08-16161	0	67	3000

Table 4.5-1 (continued)

SMWU or AOC	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/Gamma (dpm)
01-001(f)	00-603838	0–1	RE00-08-16162	0	67	3000
01-001(f)	00-603838	1–2	RE00-08-16163	0	67	3000
01-001(f)	00-603839	0–1	RE00-08-16164	0	67	3000
01-001(f)	00-603839	4.25–5.25	RE00-08-16165	0	67	3000
01-001(f)	00-603840	0–1	RE00-08-16166	0	67	3000
01-001(f)	00-603840	1.5–2.5	RE00-08-16167	0	67	3000
01-001(f)	00-603841	0–1	RE00-08-16168	0	56	2790
01-001(f)	00-603841	1–1.75	RE00-08-16169	0	56	2790
01-001(f)	00-603842	0–1	RE00-08-16170	0	56	2790
01-001(f)	00-603842	2–2.5	RE00-08-16171	0	56	2790
01-001(f)	00-603843	0–1	RE00-08-16172	0	56	2790
01-001(f)	00-603843	1.25–1.75	RE00-08-16173	0	56	2790
01-001(f)	00-603844	0–1	RE00-08-16174	0	15	1960
01-001(f)	00-603844	1.5–2.5	RE00-08-16175	0	30.8	2670
01-001(f)	00-603844	4–5	RE00-08-16176	0	73.3	2450
01-001(g)	00-603845	3.25–4.25	RE00-08-16199	0	83	2650
01-001(g)	00-603845	7.25–8.25	RE00-08-16200	0	65	2850
01-001(g)	00-603846	0–1	RE00-08-16201	0	35	3200
01-001(g)	00-603846	2.25–3.5	RE00-08-16202	0	77	3280
01-001(g)	00-603847	0–1	RE00-08-16203	0	83	3180
01-001(g)	00-603847	1–2	RE00-08-16204	0	83	3200
01-001(g)	00-603848	0–1	RE00-08-16205	0	71	3060
01-001(g)	00-603848	1–2	RE00-08-16206	0	71	3290
01-001(g)	00-603849	0–1	RE00-08-16207	0	95	2800
01-001(g)	00-603849	1.5–2.5	RE00-08-16208	0	91	2990
01-001(g)	00-603849	4–5	RE00-08-16209	0	65	3600
01-001(o)	00-603850	6.75–7.75	RE00-08-16218	0	24	2100
01-001(o)	00-603850	8.75–10	RE00-08-16219	0	45.4	2160
01-001(o)	00-603851	1–2	RE00-08-16220	0	56	2660
01-001(o)	00-603852	0–1	RE00-08-16222	0	22	2000
01-001(o)	00-603852	7.25–8.25	RE00-08-16223	0	49	2170
01-001(o)	00-603853	0–1	RE00-08-16224	0	22	2000
01-001(o)	00-603853	3–4	RE00-08-16225	0	22	2000
01-001(o)	00-603854	0–1	RE00-08-16226	0	28	2660
01-001(o)	00-603854	2–3	RE00-08-16227	0	28	2660
01-001(o)	00-603855	0–1	RE00-08-16228	0	28	2660
01-001(o)	00-603855	1.5–2.5	RE00-08-16229	0	28	2660
01-001(o)	00-603856	0–1	RE00-08-16230	0	22	3190

Table 4.5-1 (continued)

SMWU or AOC	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/Gamma (dpm)
01-001(o)	00-603856	1–2	RE00-08-16231	0	22	3190
01-001(o)	00-603857	0–1	RE00-08-16232	0	22	3190
01-001(o)	00-603857	1–2	RE00-08-16233	0	22	3190
01-001(o)	00-603858	0.25–1.25	RE00-08-16234	0	14	2290
01-001(o)	00-603858	1.75–2.75	RE00-08-16235	0	43	3220
01-001(o)	00-603858	3.75–4.5	RE00-08-16236	0	21	2350
01-001(s)	00-603867	5.75–6.75	RE00-08-16261	0	83	2320
01-001(s)	00-603867	7.75–8.75	RE00-08-16262	0	89	2300
01-001(s)	00-603868	8–9	RE00-08-16263	0	53	2350
01-001(s)	00-603868	10–11	RE00-08-16264	0	53	2460
01-001(s)	00-603870	3–4	RE00-08-16267	0	65	2580
01-001(s)	00-603870	5–6	RE00-08-16268	0	77	2280
01-001(s)	03-603859	4.75–5.75	RE00-08-16245	0	28	2770
01-001(s)	03-603859	6.75–7.75	RE00-08-16246	0	63	2570
01-001(s)	03-603860	8.5–9.5	RE00-08-16247	0	57	2390
01-001(s)	03-603860	10.5–11.5	RE00-08-16248	0	40	2440
01-001(s)	03-603861	3–4	RE00-08-16249	0	68	2880
01-001(s)	03-603861	5–6	RE00-08-16250	0	51	2880
01-001(s)	03-603862	3.25–4.25	RE00-08-16251	0	53	2536
01-001(s)	03-603862	5.25–6.25	RE00-08-16252	0	77	2680
01-001(s)	03-603863	1.5–2.5	RE00-08-16253	0	71	2610
01-001(s)	03-603863	3.5–4.5	RE00-08-16254	0	17	2730
01-001(s)	03-603864	2–3	RE00-08-16255	0	47	2300
01-001(s)	03-603864	4–5	RE00-08-16256	0	41	2410
01-001(s)	03-603865	2–3	RE00-08-16257	0	90	2650
01-001(s)	03-603865	4–5	RE00-08-16258	0	83	2800
01-001(s)	03-603866	1–2	RE00-08-16259	0	65	2640
01-001(s)	03-603866	3–4	RE00-08-16260	0	35	2830
01-001(s)	03-603869	5.25–6.25	RE00-08-16265	0	21.8	2400
01-001(s)	03-603869	7.25–8.25	RE00-08-16266	0	30	2630
01-001(s)	03-603871	1.5–2.5	RE00-08-16269	0	16.9	1991
01-001(s)	03-603871	3.5–4.5	RE00-08-16270	0	15.9	1665
01-001(u)	00-603882	1.5–2.5	RE00-08-16313	0	57	2390
01-001(u)	00-603882	3.5–4.5	RE00-08-16314	0	17	2800
01-001(u)	00-603883	1.05–2.25	RE00-08-16315	0	28	2780
01-001(u)	00-603883	3.25–4.25	RE00-08-16316	0	51	2690
01-001(c), 01-006(c,d), 01-007(b)	00-603775	12–13	RE00-08-15715	0	86	2140
01-001(c), 01-006(c,d), 01-007(b)	00-603775	14–15	RE00-08-15716	0	57	2600

Table 4.5-1 (continued)

SMWU or AOC	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/Gamma (dpm)
01-001(c), 01-006(c,d), 01-007(b)	00-603777	0–1	RE00-08-15719	0	45	2450
01-001(c), 01-006(c,d), 01-007(b)	00-603777	1.5–2.5	RE00-08-15720	0	45	2450
01-001(c), 01-006(c,d), 01-007(b)	00-603777	4–5.25	RE00-08-15763	0	45	2450
01-001(c), 01-006(c,d), 01-007(b)	00-603778	0–1.5	RE00-08-15721	0	51	2800
01-001(c), 01-006(c,d), 01-007(b)	00-603778	1.5–2.5	RE00-08-15722	0	51	2800
01-001(c), 01-006(c,d), 01-007(b)	00-603779	0–1.5	RE00-08-15723	0	51	2800
01-001(c), 01-006(c,d), 01-007(b)	00-603779	1.5–2.5	RE00-08-15724	0	51	2800
01-001(c), 01-006(c,d), 01-007(b)	00-603780	0–1	RE00-08-15725	0	45	2450
01-001(c), 01-006(c,d), 01-007(b)	00-603780	1–2	RE00-08-15726	0	45	2450
01-001(c), 01-006(c,d), 01-007(b)	00-603781	0–1	RE00-08-15727	0	49	1900
01-001(c), 01-006(c,d), 01-007(b)	00-603781	10–13	RE00-08-15764	0	79	2620
01-001(c), 01-006(c,d), 01-007(b)	00-603781	13–15	RE00-08-15765	0	50	2570
01-001(c), 01-006(c,d), 01-007(b)	00-603782	5–6.5	RE00-08-15729	0	79	2480
01-001(c), 01-006(c,d), 01-007(b)	00-603782	7.5–9	RE00-08-15730	0	50	2560
01-001(c), 01-006(c,d), 01-007(b)	00-603783	0–1	RE00-08-15731	0	27.2	1321
01-001(c), 01-006(c,d), 01-007(b)	00-603783	2.75–4	RE00-08-15732	0	27.2	1321
01-001(c), 01-006(c,d), 01-007(b)	00-603784	0–1	RE00-08-15733	0	27.2	1321
01-001(c), 01-006(c,d), 01-007(b)	00-603784	4.5–5.75	RE00-08-15734	0	27.2	1321
01-001(c), 01-006(c,d), 01-007(b)	00-603785	0–1	RE00-08-15735	0	45	2450
01-001(c), 01-006(c,d), 01-007(b)	00-603785	1–2	RE00-08-15736	0	45	2450
01-001(c), 01-006(c,d), 01-007(b)	00-603786	0–1	RE00-08-15737	0	45	2450
01-001(c), 01-006(c,d), 01-007(b)	00-603786	1–2	RE00-08-15738	0	45	2450
01-001(c), 01-006(c,d), 01-007(b)	00-603787	0–0.75	RE00-08-15739	0	83	2360
01-001(c), 01-006(c,d), 01-007(b)	00-603787	1.25–2.25	RE00-08-15740	0	83	2360
01-001(c), 01-006(c,d), 01-007(b)	00-603788	0–1	RE00-08-15741	0	83	2360
01-001(c), 01-006(c,d), 01-007(b)	00-603788	1.5–2.5	RE00-08-15742	0	83	2360
01-001(c), 01-006(c,d), 01-007(b)	00-603789	0–1	RE00-08-15743	0	83	2360
01-001(c), 01-006(c,d), 01-007(b)	00-603789	2–3	RE00-08-15744	0	83	2360
01-001(c), 01-006(c,d), 01-007(b)	00-603790	0–1	RE00-08-15745	0	51	2800
01-001(c), 01-006(c,d), 01-007(b)	00-603790	1–2.25	RE00-08-15746	0	51	2800
01-001(c), 01-006(c,d), 01-007(b)	00-603791	0–1	RE00-08-15747	0	83	2360
01-001(c), 01-006(c,d), 01-007(b)	00-603791	1–2	RE00-08-15748	0	83	2360
01-001(c), 01-006(c,d), 01-007(b)	00-603792	0–1	RE00-08-15749	0	83	2360
01-001(c), 01-006(c,d), 01-007(b)	00-603792	1.75–2.75	RE00-08-15750	0	83	2360
01-001(c), 01-006(c,d), 01-007(b)	00-603793	0–1	RE00-08-15751	0	83	2360
01-001(c), 01-006(c,d), 01-007(b)	00-603793	1–2	RE00-08-15752	0	83	2360
01-001(c), 01-006(c,d), 01-007(b)	00-603794	0–1	RE00-08-15753	0	51	2800
01-001(c), 01-006(c,d), 01-007(b)	00-603794	1–2.5	RE00-08-15754	0	51	2800

Table 4.5-1 (continued)

SMWU or AOC	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/Gamma (dpm)
01-001(c), 01-006(c,d), 01-007(b)	00-603795	0–1	RE00-08-15756	0	51	2800
01-001(c), 01-006(c,d), 01-007(b)	00-603795	1–2	RE00-08-15755	0	51	2800
01-001(c), 01-006(c,d), 01-007(b)	00-603796	0–1	RE00-08-15757	0	83	2360
01-001(c), 01-006(c,d), 01-007(b)	00-603796	1–2	RE00-08-15758	0	83	2360
01-001(c), 01-006(c,d), 01-007(b)	00-603797	0–1	RE00-08-15759	0	83	2360
01-001(c), 01-006(c,d), 01-007(b)	00-603797	2.25–3.25	RE00-08-15760	0	83	2360
01-001(c), 01-006(c,d), 01-007(b)	00-603798	0–1	RE00-08-15761	0	83	2360
01-001(c), 01-006(c,d), 01-007(b)	00-603798	2.75–3.75	RE00-08-15762	0	83	2360
01-001(t), 01-006(e), 01-007(k)	00-603872	9–10	RE00-08-16284	0	77	2870
01-001(t), 01-006(e), 01-007(k)	00-603872	11–12	RE00-08-16285	0	53	2490
01-001(t), 01-006(e), 01-007(k)	00-603873	4.5–5.5	RE00-08-16286	0	47	2550
01-001(t), 01-006(e), 01-007(k)	00-603873	6.5–7.5	RE00-08-16287	0	65	2600
01-001(t), 01-006(e), 01-007(k)	00-603874	5–6	RE00-08-16288	0	71	2790
01-001(t), 01-006(e), 01-007(k)	00-603874	7–8	RE00-08-16289	0	53	2240
01-001(t), 01-006(e), 01-007(k)	00-603875	3–4	RE00-08-16290	0	59	2570
01-001(t), 01-006(e), 01-007(k)	00-603875	5–6	RE00-08-16291	0	47	2490
01-001(t), 01-006(e), 01-007(k)	00-603876	4–5	RE00-08-16292	0	59	2630
01-001(t), 01-006(e), 01-007(k)	00-603876	6–7	RE00-08-16293	0	41	2320
01-001(t), 01-006(e), 01-007(k)	00-603877	7.5–8.5	RE00-08-16295	0	63	2070
01-001(t), 01-006(e), 01-007(k)	00-603878	12–13	RE00-08-16296	0	18.5	2010
01-001(t), 01-006(e), 01-007(k)	00-603878	14–15	RE00-08-16297	0	28.9	1683
01-001(t), 01-006(e), 01-007(k)	00-603879	1–2	RE00-08-16298	0	41	2580
01-001(t), 01-006(e), 01-007(k)	00-603879	3–4	RE00-08-16299	0	65	2660
01-001(t), 01-006(e), 01-007(k)	00-603880	2–3	RE00-08-16300	0	30.1	1923
01-001(t), 01-006(e), 01-007(k)	00-603880	4–5	RE00-08-16301	0	42.2	1895
01-001(t), 01-006(e), 01-007(k)	00-603881	1.25–2.25	RE00-08-16302	0	17	2620
01-001(t), 01-006(e), 01-007(k)	00-603881	3.25–4.25	RE00-08-16303	0	17	2620
01-001(t), 01-006(e), 01-007(k)	00-607877	5.5–6.5	RE00-08-16294	0	63	2070
01-002, 01-007(c)	00-603884	1.75–2.75	RE00-08-16321	0	51	2800
01-002, 01-007(c)	00-603884	3.75–4.75	RE00-08-16322	0	68	3090
01-002, 01-007(c)	00-603885	0.75–1.75	RE00-08-16323	0	83	2570
01-002, 01-007(c)	00-603885	2.75–3.75	RE00-08-16324	0	53	2470
01-002, 01-007(c)	00-603886	0.75–1.75	RE00-08-16325	0	65	2590
01-002, 01-007(c)	00-603886	2.75–3.75	RE00-08-16326	0	65	2600
01-002, 01-007(c)	00-603887	1–2	RE00-08-16327	0	89	2490
01-002, 01-007(c)	00-603887	3–4	RE00-08-16328	0	47	2510
01-002, 01-007(c)	00-603888	6–7	RE00-08-16329	0	71	2250
01-002, 01-007(c)	00-603888	8–9	RE00-08-16330	0	65	2730

Table 4.5-1 (continued)

SMWU or AOC	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/Gamma (dpm)
01-002, 01-007(c)	00-603889	1.25–2.25	RE00-08-16331	0	47	2440
01-002, 01-007(c)	00-603889	3.25–4.25	RE00-08-16332	0	35	2230
01-002, 01-007(c)	00-603890	0.75–1.75	RE00-08-16333	0	59	2340
01-002, 01-007(c)	00-603890	2.75–3.75	RE00-08-16334	0	59	2380
01-002, 01-007(c)	00-603891	1.25–2.25	RE00-08-16335	0	59	2790
01-002, 01-007(c)	00-603891	3.25–4.25	RE00-08-16336	0	35	2540
01-002, 01-007(c)	00-603892	2–3	RE00-08-16337	0	53	2700
01-002, 01-007(c)	00-603892	4–5	RE00-08-16338	0	53	2770
01-002, 01-007(c)	00-603893	1.5–2.5	RE00-08-16339	0	53	2210
01-002, 01-007(c)	00-603893	3.5–4.5	RE00-08-16340	0	65	2110
01-002, 01-007(c)	00-603894	11–12	RE00-08-16341	0	41	2590
01-002, 01-007(c)	00-603894	13–14	RE00-08-16342	0	89	2660
01-002, 01-007(c)	00-603895	3.25–4.25	RE00-08-16343	0	42	2300
01-002, 01-007(c)	00-603895	5.25–6.25	RE00-08-16344	0	26.5	2250
01-002, 01-007(c)	00-603896	7.25–8.25	RE00-08-16345	0	65	2230
01-002, 01-007(c)	00-603896	9.25–10.25	RE00-08-16346	0	89	2810
01-002, 01-007(c)	00-603897	5.5–7	RE00-08-16347	0	50	2170
01-002, 01-007(c)	00-603897	7.5–8.5	RE00-08-16348	0	50.4	2260
01-002, 01-007(c)	00-603898	1.25–2.25	RE00-08-16349	0	59	2460
01-002, 01-007(c)	00-603898	3.25–4.5	RE00-08-16350	0	53	2660
01-002, 01-007(c)	00-603899	1.25–2.25	RE00-08-16351	0	0	1721
01-002, 01-007(c)	00-603899	3.25–4.25	RE00-08-16352	0	19.75	1722
01-002, 01-007(c)	00-603900	1.25–2.25	RE00-08-16353	0	83	2460
01-002, 01-007(c)	00-603900	3.25–4.25	RE00-08-16354	0	41	2640
01-002, 01-007(c)	00-603901	17.5–19	RE00-08-16355	0	14	2280
01-002, 01-007(c)	00-603901	20–21	RE00-08-16356	0	36	2290
01-002, 01-007(c)	00-604530	1–2	RE00-08-16357	0	57	2430
01-002, 01-007(c)	00-604530	3–4	RE00-08-16358	0	80	2880
01-002, 01-007(c)	00-604531	6–7	RE00-08-16359	0	65	2480
01-002, 01-007(c)	00-604531	8–9	RE00-08-16360	0	77	2430
01-003(a)	00-603902	0–1	RE00-08-16375	0	32	2240
01-003(a)	00-603902	2–3	RE00-08-16376	0	28	2680
01-003(a)	00-603903	0–1	RE00-08-16377	0	28	2660
01-003(a)	00-603903	2–3	RE00-08-16378	0	28	2660
01-003(a)	00-603904	0–1	RE00-08-16379	0	45	2380
01-003(a)	00-603904	5–5.75	RE00-08-16380	0	28	2660
01-003(a)	00-603905	0–1	RE00-08-16381	0	45	2380
01-003(a)	00-603905	1–2	RE00-08-16382	0	45	2380

Table 4.5-1 (continued)

SMWU or AOC	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/Gamma (dpm)
01-003(a)	00-603906	0–1	RE00-08-16383	0	45	2380
01-003(a)	00-603906	3.75–5	RE00-08-16384	0	45	2630
01-003(a)	00-603907	0–1	RE00-08-16385	0	45	2380
01-003(a)	00-603907	1–1.75	RE00-08-16386	0	45	2380
01-003(a)	00-603908	0–1	RE00-08-16387	0	45	2380
01-003(a)	00-603908	1–2	RE00-08-16388	0	45	2380
01-003(a)	00-603909	0–1	RE00-08-16389	0	45	2380
01-003(a)	00-603909	1–2	RE00-08-16390	0	45	2380
01-003(a)	00-603910	0–1	RE00-08-16391	0	49	2600
01-003(a)	00-603910	1–1.75	RE00-08-16392	0	49	2600
01-003(a)	00-603911	0–1	RE00-08-16393	0	49	2600
01-003(a)	00-603911	1–1.75	RE00-08-16394	0	49	2600
01-003(a)	00-603912	0–1	RE00-08-16395	0	49	2600
01-003(a)	00-603912	1.5–2.5	RE00-08-16396	0	49	2600
01-003(a)	00-603913	0–1	RE00-08-16397	0	49	2600
01-003(a)	00-603913	1.75–2.75	RE00-08-16398	0	49	2600
01-003(a)	00-603914	0–1	RE00-08-16399	0	49	2600
01-003(a)	00-603914	1–2	RE00-08-16400	0	49	2600
01-003(a)	00-603915	0–1	RE00-08-16401	0	49	2600
01-003(a)	00-603915	1–2	RE00-08-16402	0	49	2600
01-003(a)	00-603916	0–1	RE00-08-16403	0	73	2670
01-003(a)	00-603916	1–2.25	RE00-08-16404	0	73	2670
01-003(a)	00-603917	0–1	RE00-08-16405	0	73	2670
01-003(a)	00-603917	1–2	RE00-08-16406	0	73	2670
01-003(a)	00-603918	0.25–1.25	RE00-08-16407	0	50	2340
01-003(a)	00-603918	3.5–4.25	RE00-08-16408	0	28	2520
01-003(a)	00-603919	0–1	RE00-08-16412	0	28	2660
01-003(a)	00-603919	3.25–4.25	RE00-08-16413	0	28	2660
01-003(b)	00-604022	0–1	RE00-08-16522	0	43	1537
01-003(b)	00-604022	2–3	RE00-08-16523	0	43	1537
01-003(b)	00-604023	0–1	RE00-08-16525	0	43	1537
01-003(b)	00-604023	4.25–5.25	RE00-08-16526	0	43	1537
01-003(b)	00-604024	0–1	RE00-08-16528	0	43	1537
01-003(b)	00-604024	1.25–2.25	RE00-08-16529	0	43	1537
01-003(b)	00-604025	0–1	RE00-08-16531	0	43	1537
01-003(b)	00-604025	3–4	RE00-08-16532	0	43	1537
01-003(b)	00-604026	0–1	RE00-08-16534	0	43	1537
01-003(b)	00-604026	1.75–2.75	RE00-08-16536	0	43	1537

Table 4.5-1 (continued)

SMWU or AOC	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/Gamma (dpm)
01-003(d)	00-604027	0–1.2	RE00-08-16543	0	15.63	1522
01-003(d)	00-604027	2–3	RE00-08-16544	0	15.63	1522
01-003(d)	00-604028	0–1	RE00-08-16545	0	15.63	1522
01-003(d)	00-604028	2–3	RE00-08-16546	0	15.63	1522
01-003(d)	00-604029	0–1	RE00-08-16547	0	15.63	1522
01-003(d)	00-604029	2–3	RE00-08-16548	0	15.63	1522
01-003(d)	00-604030	0–1	RE00-08-16549	0	15.63	1522
01-003(d)	00-604030	2–3	RE00-08-16550	0	15.63	1522
01-003(d)	00-604031	0–1	RE00-08-16551	0	15.63	1522
01-003(d)	00-604031	2–3	RE00-08-16552	0	15.63	1522
01-003(d)	00-604032	0–1	RE00-08-16553	0	15.63	1522
01-003(e)	00-604033	0–1	RE00-08-16564	0	15.63	1522
01-003(e)	00-604034	0–1	RE00-08-16566	0	15.63	1522
01-003(e)	00-604035	0–1	RE00-08-16568	0	15.63	1522
01-003(e)	00-604036	0–1	RE00-08-16570	0	15.63	1522
01-003(e)	00-604037	0–1	RE00-08-16573	0	15.63	1522
01-003(e)	00-604038	0–1	RE00-08-16574	0	15.63	1522
01-003(e)	00-604219	0–1	RE00-08-16565	0	58	2110
01-003(e)	00-604219	2–3.25	RE00-08-16567	0	58	2110
01-003(e)	00-604220	0–1	RE00-08-16569	0	58	2110
01-003(e)	00-604220	2–3	RE00-08-16571	0	58	2110
01-003(e)	00-604221	0–1	RE00-08-16572	0	58	2110
01-003(e)	00-604221	2–3	RE00-08-16575	0	58	2110
01-003(e)	00-604222	0–1	RE00-08-16576	0	58	2110
01-003(e)	00-604222	2–2.75	RE00-08-16577	0	58	2110
01-006(a)	00-604039	0–1	RE00-08-16585	0	89	2800
01-006(a)	00-604039	3–4	RE00-08-16586	0	89	2800
01-006(a)	00-604040	0–1	RE00-08-16587	0	21	2100
01-006(a)	00-604040	3.25–4.25	RE00-08-16588	0	21	2100
01-006(a)	00-604041	0–1	RE00-08-16589	0	81	3120
01-006(a)	00-604041	4–5	RE00-08-16590	0	95	2960
01-006(a)	00-604042	0–1	RE00-08-16591	0	21	2100
01-006(a)	00-604042	2.25–3.25	RE00-08-16592	0	21	2100
01-006(a)	00-604043	0–1	RE00-08-16593	0	21	2100
01-006(a)	00-604043	1–2	RE00-08-16594	0.1	21	2100
01-006(a)	00-604044	0–1	RE00-08-16595	0	35	3100
01-006(a)	00-604044	1–2	RE00-08-16596	0	83	3100
01-006(a)	00-604045	0–1	RE00-08-16597	0	16	3100

Table 4.5-1 (continued)

SMWU or AOC	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/Gamma (dpm)
01-006(a)	00-604045	1–2	RE00-08-16598	0	61	3600
01-006(a)	00-604046	0–1	RE00-08-16599	0	26	3100
01-006(a)	00-604046	1.5–2.5	RE00-08-16600	0	15	644
01-006(a)	00-604047	0–1	RE00-08-16601	0	47	2380
01-006(a)	00-604047	1.5–2.5	RE00-08-16602	0	41	2580
01-006(a)	00-604047	4–5	RE00-08-16603	0	83	2730
01-006(g)	00-604048	0–1	RE00-08-16613	0	21	2100
01-006(g)	00-604048	1–2	RE00-08-16614	0	21	2100
01-006(g)	00-604049	0–1	RE00-08-16615	0	21	2100
01-006(g)	00-604049	3.25–4.25	RE00-08-16616	0	21	2100
01-006(g)	00-604050	0–1	RE00-08-16617	0	21	2100
01-006(g)	00-604050	2.5–3.5	RE00-08-16618	0	21	2100
01-006(g)	00-604051	0–1	RE00-08-16619	0	65	2620
01-006(g)	00-604051	1.5–2.5	RE00-08-16620	0	41	2540
01-006(g)	00-604051	4–5	RE00-08-16621	0	53	2550
01-006(o)	00-604052	1.25–2.25	RE00-08-16627	0	89	2470
01-006(o)	00-604053	1.5–2.5	RE00-08-16629	0	21	2420
01-006(o)	00-604054	0.75–1.75	RE00-08-16631	0	53	2110
01-006(o)	00-604055	0.25–1.25	RE00-08-16633	0	57	2440
01-006(o)	00-604055	1.75–2.75	RE00-08-16634	0	25	2560
01-006(o)	00-604055	4–5	RE00-08-16635	0	35	1850
01-007(d)	00-604241	4–5	RE00-09-268	0	59	2370
01-007(d)	00-604241	6–7	RE00-08-269	0	83	2380
01-007(d)	00-604242	5.75–7.5	RE00-09-270	0	59	2400
01-007(d)	00-604242	7.75–8.75	RE00-09-271	0	59	2500
01-007(d)	00-604243	0.75–1.75	RE00-09-272	0	35	2290
01-007(d)	00-604243	2.75–3.75	RE00-09-273	0	53	2600
01-007(e)	00-604244	4.75–5.75	RE00-09-278	0	41	2540
01-007(e)	00-604244	6.75–7.75	RE00-09-279	0	47	2470
01-007(e)	00-604245	0.75–2.25	RE00-09-280	0	35	2460
01-007(e)	00-604245	2.75–3.75	RE00-09-281	0	18	1067
01-007(j)	00-604246	1–2	RE00-09-286	0	41	2590
01-007(j)	00-604246	3–4	RE00-09-287	0	77	2440
01-007a, 01-006(b,n)	00-604223	15–16	RE00-09-204	0	37.4	2290
01-007a, 01-006(b,n)	00-604223	17–18	RE00-09-205	0	32.5	1811
01-007a, 01-006(b,n)	00-604224	0–1	RE00-09-206	0	26	2070
01-007a, 01-006(b,n)	00-604224	1–2	RE00-09-207	0	26	2070
01-007a, 01-006(b,n)	00-604225	0–1	RE00-09-208	0	26	2070

Table 4.5-1 (continued)

SMWU or AOC	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/Gamma (dpm)
01-007a, 01-006(b,n)	00-604225	1–2	RE00-09-209	0	26	2070
01-007a, 01-006(b,n)	00-604226	0–1	RE00-09-210	0	26	2070
01-007a, 01-006(b,n)	00-604226	1.25–2.25	RE00-09-211	0	26	2070
01-007a, 01-006(b,n)	00-604227	0–1	RE00-09-212	0	26	2070
01-007a, 01-006(b,n)	00-604227	7–8	RE00-09-213	0	26	2070
01-007a, 01-006(b,n)	00-604228	0–1	RE00-09-214	0	26	2070
01-007a, 01-006(b,n)	00-604228	8.25–9.25	RE00-09-215	0	49	2180
01-007a, 01-006(b,n)	00-604229	0–1	RE00-09-216	0	49	2180
01-007a, 01-006(b,n)	00-604229	1–2	RE00-09-217	0	49	2180
01-007a, 01-006(b,n)	00-604230	0–1	RE00-09-218	0	39.3	1833
01-007a, 01-006(b,n)	00-604230	1–2	RE00-09-219	0	39.3	1833
01-007a, 01-006(b,n)	00-604231	0–1	RE00-09-220	0	12	488
01-007a, 01-006(b,n)	00-604231	1–2	RE00-09-221	0	13	396
01-007a, 01-006(b,n)	00-604232	0–1	RE00-09-222	0	42	1116
01-007a, 01-006(b,n)	00-604232	1–2	RE00-09-223	0	42	1116
01-007a, 01-006(b,n)	00-604233	0–1	RE00-09-224	0	33	895
01-007a, 01-006(b,n)	00-604233	1–2	RE00-09-225	0	33	895
01-007a, 01-006(b,n)	00-604234	0–1	RE00-09-226	0	60	3000
01-007a, 01-006(b,n)	00-604234	1–2	RE00-09-227	0	60	3000
01-007a, 01-006(b,n)	00-604235	0–1	RE00-09-228	0	60	3000
01-007a, 01-006(b,n)	00-604235	1–2	RE00-09-229	0	60	3000
01-007a, 01-006(b,n)	00-604236	0–1	RE00-09-230	0	60	3000
01-007a, 01-006(b,n)	00-604236	1–2	RE00-09-231	0	60	3000
01-007a, 01-006(b,n)	00-604237	0–1	RE00-09-232	0	39.3	1833
01-007a, 01-006(b,n)	00-604237	2–3	RE00-09-233	0	162	1321
01-007a, 01-006(b,n)	00-604237	4–5	RE00-09-234	0	147	1202
01-007a, 01-006(b,n)	00-604238	0–1	RE00-09-235	0	49	2180
01-007a, 01-006(b,n)	00-604238	1.5–2.5	RE00-09-236	0	49	2180
01-007a, 01-006(b,n)	00-604238	4–5	RE00-09-237	0	49	2180
01-007a, 01-006(b,n)	00-604238	6.5–7.5	RE00-09-246	0	49	2180
01-007a, 01-006(b,n)	00-604239	5–6	RE00-09-238	0	39.5	1580
01-007a, 01-006(b,n)	00-604239	8–9	RE00-09-239	0	57	2500
01-007a, 01-006(b,n)	00-604239	11–12.5	RE00-09-240	0	43	2270
01-007a, 01-006(b,n)	00-604239	13.5–15	RE00-09-241	0	23	2460
01-007a, 01-006(b,n)	00-604240	5–6.5	RE00-09-242	0	93	1916
01-007a, 01-006(b,n)	00-604240	8–9	RE00-09-243	0	54.3	2280
01-007a, 01-006(b,n)	00-604240	11–12	RE00-09-244	0	56.9	1964
01-007a, 01-006(b,n)	00-604240	14–15	RE00-09-245	0	56.9	1888

Table 4.5-1 (continued)

SMWU or AOC	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/Gamma (dpm)
03-009(j)	00-604252	1.75–3	RE00-09-331	0	65	2600
03-009(j)	00-604252	4–5	RE00-09-332	0	53	2300
03-009(j)	00-604253	1.5–2.5	RE00-09-335	0	29	1982
03-009(j)	00-604253	3.5–4.5	RE00-09-336	0	59	2080
03-038(a,b)	00-604254	2–3	RE00-09-343	0	41	2230
03-038(a,b)	00-604254	4–5	RE00-09-344	0	65	2630
03-038(a,b)	00-604254	6–7	RE00-09-345	0	53	2340
03-038(a,b)	00-604255	1.5–2.5	RE00-09-346	0	29	2730
03-038(a,b)	00-604255	3.5–4.5	RE00-09-347	0	77	2520
03-038(a,b)	00-604255	5.5–6.5	RE00-09-348	0	23	2390
03-038(a,b)	00-604256	2–3	RE00-09-350	0	41	2470
03-038(a,b)	00-604256	4–5	RE00-09-351	0	41	2470
03-038(a,b)	00-604256	7.25–8.25	RE00-09-349	0	47	2280
03-038(a,b)	00-604257	1–2	RE00-09-352	0	35	2710
03-038(a,b)	00-604257	3–4	RE00-09-353	0	41	2370
03-038(a,b)	00-604257	5–6	RE00-09-354	0	11	2300
03-038(a,b)	00-604258	2.25–3.25	RE00-09-355	0	35	2600
03-038(a,b)	00-604258	4.25–5.25	RE00-09-356	0	53	2530
03-038(a,b)	00-604258	6.25–7.25	RE00-09-357	0	59	2180
03-038(a,b)	00-604259	2.25–3.25	RE00-09-358	0	53	2760
03-038(a,b)	00-604259	4.25–5.25	RE00-09-359	0	56	2167
03-038(a,b)	00-604259	6.25–7.25	RE00-09-360	0	83	2380
03-055(c)	03-603243	0–0.85	RE03-08-9417	na[c]	na	na
03-055(c)	03-603243	0.85–1.64	RE03-08-9421	na	na	na
03-055(c)	03-603245	0–0.46	RE03-08-9425	na	na	na
03-055(c)	03-603245	0.46–1.05	RE03-08-9429	na	na	na
03-055(c)	03-603247	0–0.66	RE03-08-9430	na	na	na
03-055(c)	03-603248	0–1.08	RE03-08-9431	na	na	na
03-055(c)	03-603248	1.08–4.43	RE03-08-9432	na	na	na
03-055(c)	03-603250	0–0.66	RE03-08-9433	na	na	na
03-055(c)	03-603250	0.66–1.64	RE03-08-9434	na	na	na
03-055(c)	03-603250	1.64–2.30	RE03-08-9435	na	na	na
03-055(c)	03-603250	2.30–3.12	RE03-08-9436	na	na	na
03-055(c)	03-603254	0–1.15	RE03-08-9437	na	na	na
03-055(c)	03-603255	0–1.48	RE03-08-9438	na	na	na
03-055(c)	03-603256	0–0.66	RE03-08-9439	na	na	na
03-055(c)	03-603257	0–0.79	RE03-08-9440	na	na	na
03-055(c)	03-603258	0–1.48	RE03-08-9441	na	na	na

Table 4.5-1 (continued)

SMWU or AOC	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/Gamma (dpm)
03-055(c)	03-603258	1.48–2.13	RE03-08-9442	na	na	na
03-055(c)	03-603258	2.13–3.12	RE03-08-9443	na	na	na
03-055(c)	03-603258	3.12–3.61	RE03-08-9444	na	na	na
03-055(c)	03-603258	3.61–4	RE03-08-9445	na	na	na
32-001	00-603575	1.5–2.5	RE00-08-15110	0	<mda[d]	<mda
32-001	00-603575	3.5–4.5	RE00-08-15111	0	<mda	<mda
32-001	00-603576	1.5–2.5	RE00-08-15114	0	<mda	<mda
32-001	00-603576	3.5–4.5	RE00-08-15115	0	<mda	<mda
32-001	00-603577	1.5–2.5	RE00-08-15119	0	32	2010
32-001	00-603577	3.5–4.5	RE00-08-15131	0	32	2010
32-001	00-603578	1.5–2.5	RE00-08-15122	0	<mda	<mda
32-001	00-603578	3.5–4.5	RE00-08-15123	0	<mda	<mda
32-001	00-603579	1.5–3	RE00-08-15127	0	<mda	<mda
32-001	00-603579	3.6–4.6	RE00-08-15129	0	<mda	<mda
32-002(a)	00-603580	2–3	RE00-08-15140	2	<mda	<mda
32-002(a)	00-603580	4–5	RE00-08-15141	0	<mda	<mda
32-002(a)	00-603581	3–4	RE00-08-15142	0	<mda	<mda
32-002(a)	00-603581	5–6	RE00-08-15143	0	<mda	<mda
32-002(a)	00-603582	4–5	RE00-08-15144	0	<mda	<mda
32-002(a)	00-603582	6–7	RE00-08-15145	0	<mda	<mda
32-002(a)	00-603583	6.5–7.5	RE00-08-15146	0	<mda	<mda
32-002(a)	00-603583	8.5–9.5	RE00-08-15147	0	<mda	<mda
32-002(a)	00-603584	1.5–2.5	RE00-08-15148	0	67	1859
32-002(a)	00-603584	3.5–4.5	RE00-08-15149	0	67	1859
32-002(a)	00-603585	0–1	RE00-08-15150	0	67	1859
32-002(a)	00-603585	2–3	RE00-08-15151	0	67	1859
32-002(a)	00-603586	0–1	RE00-08-15152	0	67	1859
32-002(a)	00-603586	2–3	RE00-08-15153	0	67	1859
32-002(a)	00-603587	0–1	RE00-08-15154	0	67	1859
32-002(a)	00-603587	2–3	RE00-08-15155	0	67	1859
32-002(a)	00-603588	0–1	RE00-08-15156	0	67	1859
32-002(a)	00-603588	2–3	RE00-08-15157	0	67	1859
32-002(b)	00-603589	3.5–4.5	RE00-08-15167	0	32	2010
32-002(b)	00-603589	5.5–6.5	RE00-08-15168	0	32	2010
32-002(b)	00-603590	5.5–6.5	RE00-08-15169	0	0	1246
32-002(b)	00-603590	7.5–8.5	RE00-08-15170	0	0	1246
32-002(b)	00-603591	5.5–6.5	RE00-08-15171	0	24.4	1143
32-002(b)	00-603591	7.5–8.5	RE00-08-15172	0	24.4	1143

Table 4.5-1 (continued)

SMWU or AOC	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/Gamma (dpm)
32-002(b)	00-603592	3.5–4.5	RE00-08-15173	0	24.4	1143
32-002(b)	00-603592	5.5–6.5	RE00-08-15174	0	24.4	1143
32-002(b)	00-603593	0–1	RE00-08-15175	0	15	1448
32-002(b)	00-603593	2–3	RE00-08-15176	0	15	1448
32-002(b)	00-603594	3.5–4.5	RE00-08-15177	0	0	1246
32-002(b)	00-603594	6.5–7.5	RE00-08-15178	0	0	1246
32-002(b)	00-603595	1.2–2.2	RE00-08-15179	0	24.4	1143
32-002(b)	00-603595	3.2–4.2	RE00-08-15180	0	24.4	1143
32-002(b)	00-603596	1.25–2.25	RE00-08-15181	0	7	1187
32-002(b)	00-603596	3.25–4.25	RE00-08-15182	0	7	1187
32-002(b)	00-603597	0.75–1.75	RE00-08-15183	0	15	1448
32-002(b)	00-603597	2.75–3.75	RE00-08-15184	0	15	1448
32-002(b)	00-603598	1.25–2.25	RE00-08-15185	0	15	1448
32-002(b)	00-603598	3.25–4.25	RE00-08-15186	0	15	1448
32-002(b)	00-603599	0–0.5	RE00-08-15187	0	45	1857
32-002(b)	00-603599	2.5–3.5	RE00-08-15188	0	45	1857
32-003	00-603600	4.75–5.75	RE00-08-15211	0	7	1187
32-003	00-603600	6.75–7.25	RE00-08-15212	0	29	2010
32-003	00-603601	0–1	RE00-08-15205	0	29	2010
32-003	00-603601	2–2.5	RE00-08-15206	0	29	2010
32-003	00-603602	0–1	RE00-08-15207	0	15	1448
32-003	00-603602	2–3	RE00-08-15208	0	15	1448
32-003	00-603603	0–1	RE00-08-15209	0	29	2010
32-003	00-603603	2–2.5	RE00-08-15210	0	29	2010
32-003	00-603604	3–3.5	RE00-08-15203	0	60	2010
32-003	00-603604	5.5–6.5	RE00-08-15204	0	60	2010
32-003	00-603605	2–3	RE00-08-15213	0	60	2010
32-003	00-603605	4–5	RE00-08-15214	0	60	2010
32-003	00-603606	2.25–2.75	RE00-08-15215	0	29	2010
32-003	00-603606	3.75–4.25	RE00-08-15216	0	29	2010
32-003	00-603607	5–6	RE00-08-15218	0	7	1187
32-003	00-603607	7–8	RE00-08-15219	0	7	1187
32-003	00-603608	1.5–2	RE00-08-15217	0	15	1448
32-003	00-603608	3–3.5	RE00-08-15220	0	15	1448
32-003	00-603609	1.75–2.25	RE00-08-15221	0	29	2010
32-003	00-603609	3.25–3.75	RE00-08-15222	0	29	2010
32-003	00-603610	1.5–2	RE00-08-15223	0	15	1448
32-003	00-603610	3–3.5	RE00-08-15224	0	15	1448

Table 4.5-1 (continued)

SMWU or AOC	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/Gamma (dpm)
32-003	00-603611	2.25–2.75	RE00-08-15225	0	29	2010
32-003	00-603611	3.75–4.25	RE00-08-15226	0	29	2010
32-004	00-603612	1–1.5	RE00-08-15242	0	60	2010
32-004	00-603612	2.5–3	RE00-08-15243	0	60	2010
32-004	00-603612	5–6	RE00-08-15245	0	60	2010
41-001	00-603725	5.5–6.5	RE00-08-15392	0	59	2870
41-001	00-603725	7.5–8.5	RE00-08-15393	0	65	2800
41-001	00-603726	5–6	RE00-08-15394	0	65	2730
41-001	00-603726	7–8	RE00-08-15395	0	65	2880
41-001	00-603727	2–3	RE00-08-15396	0	30	1780
41-001	00-603727	4–5	RE00-08-15397	0	41	1785
41-001	00-603728	1.75–2.75	RE00-08-15398	0	47	3023
41-001	00-603728	3.75–4.75	RE00-08-15399	0	35	2900
41-001	00-603729	2–3	RE00-08-15400	0	65	2990
41-001	00-603729	4–5	RE00-08-15401	0	71	2660
41-001	00-603730	3.5–4.5	RE00-08-15402	0	83	2870
41-001	00-603730	5.5–6.5	RE00-08-15403	0	47	3200
41-001	00-603731	3–4	RE00-08-15404	0	83	2910
41-001	00-603731	5–6	RE00-08-15405	0	53	2960
41-001	00-603732	3.5–4.5	RE00-08-15406	0	55	3120
41-001	00-603732	5.5–6.5	RE00-08-15407	0	89	3210
41-001	00-603733	2.25–3.25	RE00-08-15408	0	65	3020
41-001	00-603733	4.25–5.25	RE00-08-15409	0	54	3020
41-001	00-603734	2–3	RE00-08-15410	0	71	3160
41-001	00-603734	4–5	RE00-08-15411	0	53	3180
41-001	00-603735	0–1	RE00-08-15412	0	47	2800
41-001	00-603735	2.25–3.25	RE00-08-15413	0	77	2810
41-001	00-603736	4.5–5.5	RE00-08-15414	0	65	2620
41-001	00-603736	6.5–7.5	RE00-08-15415	0	53	2590
41-001	00-603737	0–1	RE00-08-15416	0	71	2880
41-001	00-603737	2–3	RE00-08-15417	0	29	2540
41-001	00-603740	2.5–3.5	RE00-08-15422	0	30	1771
41-001	00-603740	4–5	RE00-08-15423	0	83	3060
41-001	00-603740	6.5–8	RE00-08-15424	0	89	2830
43-001(b2)	00-604264	0–1	RE00-09-385	0	0	2000
43-001(b2)	00-604264	2–3	RE00-09-386	0	0	1972
43-001(b2)	00-604265	0–1	RE00-09-387	0	14	1514
43-001(b2)	00-604265	1.5–2.5	RE00-09-388	0	30	1902

Table 4.5-1 (continued)

SMWU or AOC	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/Gamma (dpm)
43-001(b2)	00-604266	0–1	RE00-09-389	0	0	1828
43-001(b2)	00-604266	3.25–4.25	RE00-09-390	0	41.4	1907
43-001(b2)	00-604267	0–1	RE00-09-391	0	40.1	2110
43-001(b2)	00-604267	1–2	RE00-09-392	0	14	1482
43-001(b2)	00-604268	0–1	RE00-09-393	0	16	1800
43-001(b2)	00-604268	1–2	RE00-09-394	0	48	2400
43-001(b2)	00-604269	0–1	RE00-09-395	0	48	2200
43-001(b2)	00-604269	1–2	RE00-09-396	0	30	2130
43-001(b2)	00-604270	0–1	RE00-09-397	0	36	2380
43-001(b2)	00-604270	1–2	RE00-09-398	0	60	2310
43-001(b2)	00-604271	0–1	RE00-09-399	0	24	2120
43-001(b2)	00-604271	1–2	RE00-09-400	0	30	2330
43-001(b2)	00-604272	0–1	RE00-09-401	0	40	2300
43-001(b2)	00-604272	1.5–2.5	RE00-09-402	0	66	2470
43-001(b2)	00-604273	0–1	RE00-09-403	0	69	2500
43-001(b2)	00-604273	1–2.5	RE00-09-404	0	18	2340
43-001(b2)	00-604276	0–1	RE00-09-409	0	31	1200
43-001(b2)	00-604276	1.5–2.5	RE00-09-410	0	32	2350
43-001(b2)	00-604276	4–5	RE00-09-411	0	32	2240
C-43-001	00-604277	0–1	RE00-09-426	0	34.1	1542
C-43-001	00-604277	1–2	RE00-09-427	0	55	2480
C-43-001	00-604278	0–1	RE00-09-428	0	68.4	1896
C-43-001	00-604278	1.5–2.5	RE00-09-429	0	0	1499
C-43-001	00-604279	0–1	RE00-09-430	0	37.2	1617
C-43-001	00-604279	2.5–3.5	RE00-09-431	0	41.4	1520
C-43-001	00-604286	0–1	RE00-09-444	0	24	1824
C-43-001	00-604286	1.5–2.5	RE00-09-445	0	0	1836
C-43-001	00-604286	4–5	RE00-09-446	0	0	1890
C-43-001	00-604846	0–1	RE00-09-5306	0	51.7	1726
C-43-001	00-604846	1.5–2.5	RE00-09-5307	0	51.7	1726
C-43-001	00-604847	0–1	RE00-09-5308	0	51.7	1726
C-43-001	00-604847	1–2	RE00-09-5309	0	51.7	1726
C-43-001	00-604848	0–1	RE00-09-5310	0	51.7	1726
C-43-001	00-604848	1–2	RE00-09-5311	0	51.7	1726
61-007	00-604287	0.5–1.5	RE00-09-459	0	73	2300
61-007	00-604287	4.5–5.5	RE00-09-460	0	14	1808
61-007	00-604287	9.5–10.5	RE00-09-461	0	50	1908
61-007	00-604287	14.5–15.5	RE00-09-462	0.2	62	1802

Table 4.5-1 (continued)

SMWU or AOC	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/Gamma (dpm)
61-007	00-604287	17–17.5	RE00-09-463	0.3	57	2370
61-007	00-604288	0.5–1.5	RE00-09-465	0	46	2260
61-007	00-604288	4.5–5.5	RE00-09-466	0	50	1626
61-007	00-604289	0.5–1.5	RE00-09-471	0	36	2140
61-007	00-604289	4.5–5.5	RE00-09-472	0	42	567
61-007	00-604289	9.5–10.5	RE00-09-473	0	64	1902
61-007	00-604289	14–15	RE00-09-474	0	43	2330
61-007	00-604290	0.5–1.5	RE00-09-477	0	64	2010
61-007	00-604290	4.5–5.5	RE00-09-478	0	14	2210
61-007	00-604290	9.5–10.5	RE00-09-479	0	36	2260
61-007	00-604290	14.5–15.5	RE00-09-480	0	21	2030
61-007	00-604290	31.5–32.5	RE00-09-481	0	57	2000
61-007	00-604291	2.75–3.75	RE00-09-483	0	36	2140
61-007	00-604291	7.75–8.75	RE00-09-484	0	36	2080
61-007	00-604291	12.75–13.75	RE00-09-485	0	36	2080
61-007	00-604532	0.5–1.5	RE00-09-486	0	50	2130
61-007	00-604532	4.5–5.5	RE00-09-487	0	43	2170
61-007	00-604532	5.75–6.75	RE00-09-488	0	64	2460

[a] ppm = Parts per million.

[b] dpm = Disintegrations per minute.

[c] na = Not available.

[d] mda = Minimum detectable activity.

Table 5.3-1
Samples Collected and Analyses Requested at SWMU 00-017

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Pesticides	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-98-0050	00-10125	18.50–19.00	FILL	—*	—	4651R	4651R	4651R	4651R	4650R	4649R	—	4649R	—	4649R	4649R	4650R
RE00-98-0052	00-10125	19.00–19.50	QBT4	—	—	4651R	4651R	4651R	4651R	4650R	4649R	—	4649R	—	4649R	4649R	4650R
RE00-98-0053	00-10126	20.00–20.60	FILL	—	—	4651R	4651R	4651R	4651R	4650R	4649R	—	4649R	—	4649R	4649R	4650R
RE00-98-0054	00-10126	22.50–25.00	QBT4	—	—	4702R	4702R	4702R	4702R	4701R	4700R	—	4700R	—	4700R	4700R	4701R
RE00-98-0056	00-10127	19.00–21.50	QBT4	—	—	4665R	4665R	4665R	4665R	4664R	4663R	—	4663R	—	4663R	4663R	4664R
RE00-98-0057	00-10127	22.50–25.00	QBT4	—	—	4665R	4665R	4665R	4665R	4664R	4663R	—	4663R	—	4663R	4663R	4664R
RE00-98-0059	00-10128	19.00–21.50	FILL	—	—	4665R	4665R	4665R	4665R	4664R	4663R	—	4663R	—	4663R	4663R	4664R
RE00-98-0060	00-10128	22.50–25.00	QBT4	—	—	4665R	4665R	4665R	4665R	4664R	4663R	—	4663R	—	4663R	4663R	4664R
RE00-98-0062	00-10129	19.50–22.00	FILL	—	—	4702R	4702R	4702R	4702R	4701R	4700R	—	4700R	—	4700R	4700R	4701R
RE00-98-0063	00-10129	22.50–25.00	QBT4	—	—	4702R	4702R	4702R	4702R	4701R	4700R	—	4700R	—	4700R	4700R	4701R
RE00-98-0065	00-10130	19.50–22.00	FILL	—	—	4702R	4702R	4702R	4702R	4701R	4700R	—	4700R	—	4700R	4700R	4701R
RE00-98-0066	00-10130	24.00–26.50	QBT4	—	—	4702R	4702R	4702R	4702R	4701R	4700R	—	4700R	—	4700R	4700R	4701R
RE00-98-0068	00-10131	20.50–23.00	FILL	—	—	4702R	4702R	4702R	4702R	4701R	4700R	—	4700R	—	4700R	4700R	4701R
RE00-98-0069	00-10131	25.00–27.50	QBT4	—	—	4702R	4702R	4702R	4702R	4701R	4700R	—	4700R	—	4700R	4700R	4701R
RE00-98-0072	00-10132	16.00–18.50	FILL	—	—	4921R	4921R	4921R	4921R	4920R	4919R	—	4919R	—	4919R	4919R	4920R
RE00-98-0073	00-10132	20.00–22.50	QBT4	—	—	4921R	4921R	4921R	4921R	4920R	4919R	—	4919R	—	4919R	4919R	4920R
RE00-98-0074	00-10133	15.00–17.50	SOIL	—	—	4921R	4921R	4921R	4921R	4920R	4919R	—	4919R	—	4919R	4919R	4920R
RE00-98-0076	00-10133	18.50–21.00	QBT4	—	—	4921R	4921R	4921R	4921R	4920R	4919R	—	4919R	—	4919R	4919R	4920R
RE00-98-0078	00-10134	15.00–17.50	SOIL	—	—	4921R	4921R	4921R	4921R	4920R	4919R	—	4919R	—	4919R	4919R	4920R
RE00-98-0079	00-10134	20.00–22.50	QBT4	—	—	4921R	4921R	4921R	4921R	4920R	4919R	—	4919R	—	4919R	4919R	4920R
RE00-98-0083	00-10135	14.00–15.50	SOIL	—	—	4921R	4921R	4921R	4921R	4920R	4919R	—	4919R	—	4919R	4919R	4920R
RE00-98-0084	00-10135	20.00–22.50	QBT4	—	—	4921R	4921R	4921R	4921R	4920R	4919R	—	4919R	—	4919R	4919R	4920R
RE00-98-0085	00-10136	12.50–14.50	QBT4	—	—	4921R	4921R	4921R	4921R	4920R	4919R	—	4919R	—	4919R	4919R	4920R

Table 5.3-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Pesticides	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-98-0086	00-10136	14.50–16.00	QBT4	—	—	4921R	4921R	4921R	4921R	4920R	4919R	—	4919R	—	4919R	4919R	4920R
RE00-98-0087	00-10137	12.50–15.00	SOIL	—	—	4921R	4921R	4921R	4921R	4920R	4919R	—	4919R	—	4919R	4919R	4920R
RE00-98-0088	00-10137	16.00–18.50	QBT4	—	—	4921R	4921R	4921R	4921R	4920R	4919R	—	4919R	—	4919R	4919R	4920R
RE00-98-0089	00-10138	12.50–15.00	SOIL	—	—	4921R	4921R	4921R	4921R	4920R	4919R	—	4919R	—	4919R	4919R	4920R
RE00-98-0090	00-10138	15.00–17.50	QBT4	—	—	4921R	4921R	4921R	4921R	4920R	4919R	—	4919R	—	4919R	4919R	4920R
RE00-98-0091	00-10139	13.00–15.00	SOIL	—	—	4921R	4921R	4921R	4921R	4920R	4919R	—	4919R	—	4919R	4919R	4920R
RE00-98-0092	00-10139	15.00–17.50	QBT4	—	—	4921R	—	4921R	4921R	4920R	4919R	—	4919R	—	4919R	4919R	4920R
RE00-98-0093	00-10140	12.50–15.00	SOIL	—	—	4921R	4921R	4921R	4921R	4920R	4919R	—	4919R	—	4919R	4919R	4920R
RE00-98-0094	00-10140	16.00–18.50	QBT4	—	—	—	4921R	4921R	4921R	4920R	4919R	—	4919R	—	4919R	4919R	4920R
RE00-98-0095	00-10141	7.50–9.00	SOIL	—	—	4945R	4945R	4945R	4945R	4944R	4943R	—	4943R	—	4943R	4943R	4944R
RE00-98-0099	00-10143	0.10–0.70	SED	—	—	4928R	4928R	4928R	4928R	4918R	4955R	—	4955R	—	4955R	4955R	4918R
RE00-98-0101	00-10144	1.00–2.00	SED	—	—	4928R	4928R	4928R	4928R	4918R	4955R	—	4955R	—	4955R	4955R	4918R
RE00-98-0103	00-10145	0.3000–1.00	SED	—	—	4928R	4928R	4928R	4928R	4918R	4955R	—	4955R	—	4955R	4955R	4918R
RE00-98-0105	00-10146	0.2000–1.00	SED	—	—	4928R	4928R	4928R	4928R	4918R	4955R	—	4955R	—	4955R	4955R	4918R
RE00-99-0003	00-10179	0.1000–0.50	SOIL	—	—	—	—	—	—	5135R	—	—	—	—	—	—	—
RE00-99-0004	00-10180	0.10–0.40	SOIL	—	—	—	—	—	—	5135R	—	—	—	—	—	—	—
RE00-99-0005	00-10181	0.10–0.80	SOIL	—	—	—	—	—	—	5142R	—	—	—	—	—	—	—
RE00-99-0006	00-10182	0.20–0.80	SOIL	—	—	—	—	—	—	5142R	—	—	—	—	—	—	—
RE00-99-0007	00-10183	0.10–0.30	SOIL	—	—	—	—	—	—	5142R	—	—	—	—	—	—	—
RE00-99-0008	00-10184	0.10–0.60	SOIL	—	—	—	—	—	—	5142R	—	—	—	—	—	—	—
RE00-09-310	00-604247	0.00–1.00	SED	09-710	09-710	09-710	09-710	09-710	09-710	09-710	—	09-710	—	09-710	—	—	09-710
RE00-09-311	00-604247	2.00–3.00	SED	09-710	09-710	09-710	09-710	09-710	09-710	09-710	—	09-710	—	09-710	—	—	09-710
RE00-09-312	00-604247	4.00–5.00	SED	09-710	09-710	09-710	09-710	09-710	09-710	09-710	—	09-710	—	09-710	—	—	09-710
RE00-09-313	00-604248	1.25–2.25	QBT2	09-646	09-645	09-646	09-646	09-646	09-646	09-645	—	09-645	—	09-646	—	—	09-645

Table 5.3-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Pesticides	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-09-314	00-604248	3.25–4.25	QBT2	09-646	09-645	09-646	09-646	09-646	09-646	09-645	—	09-645	—	09-646	—	—	09-645
RE00-09-315	00-604248	5.25–6.25	QBT2	09-646	09-645	09-646	09-646	09-646	09-646	09-645	—	09-645	—	09-646	—	—	09-645
RE00-09-316	00-604249	2.00–3.00	QBT2	09-646	09-645	09-646	09-646	09-646	09-646	09-645	—	09-645	—	09-646	—	—	09-645
RE00-09-317	00-604249	4.00–5.00	QBT2	09-646	09-645	09-646	09-646	09-646	09-646	09-645	—	09-645	—	09-646	—	—	09-645
RE00-09-318	00-604249	6.00–7.00	QBT2	09-646	09-645	09-646	09-646	09-646	09-646	09-645	—	09-645	—	09-646	—	—	09-645
RE00-09-319	00-604250	1.50–2.50	QBT3	09-646	09-645	09-646	09-646	09-646	09-646	09-645	—	09-645	—	09-646	—	—	09-645
RE00-09-320	00-604250	3.50–4.50	QBT3	09-646	09-645	09-646	09-646	09-646	09-646	09-645	—	09-645	—	09-646	—	—	09-645
RE00-09-321	00-604250	5.50–6.50	QBT3	09-646	09-645	09-646	09-646	09-646	09-646	09-645	—	09-645	—	09-646	—	—	09-645
RE00-09-322	00-604251	2.75–3.75	QBT3	09-646	09-645	09-646	09-646	09-646	09-646	09-645	—	09-645	—	09-646	—	—	09-645
RE00-09-323	00-604251	4.75–5.75	QBT3	09-646	09-645	09-646	09-646	09-646	09-646	09-645	—	09-645	—	09-646	—	—	09-645
RE00-09-324	00-604251	6.75–7.75	QBT3	09-646	09-645	09-646	09-646	09-646	09-646	09-645	—	09-645	—	09-646	—	—	09-645

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 5.3-2
Inorganic Chemicals above BVs at SWMU 00-017

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Thallium	Vanadium
SOIL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**[b]	**na**	**1.52**	**1**	**0.73**	**39.6**
QBT2,QBT3,QBT4 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14500**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**1.1**	**17**
SED Background Value[a]				**15400**	**0.83**	**3.98**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**0.82**	**13800**	**19.7**	**2370**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**0.73**	**19.7**
RE00-98-0050	00-10125	18.50–19.00	FILL	—[c]	14 (UJ)	—	—	—	0.68 (U)	—	34	—	—	0.68 (U)	—	—	—	—	3.4	—	NA[d]	NA	—	2.7 (U)	—	—
RE00-98-0052	00-10125	19.00–19.50	QBT4	10000	13 (UJ)	4.5	72	—	—	—	—	—	—	0.63 (U)	—	—	1900	—	0.13 (U)	—	NA	NA	0.63 (U)	2.5 (U)	—	—
RE00-98-0053	00-10126	20.00–20.60	FILL	—	13 (UJ)	—	—	—	0.63 (U)	—	—	—	—	1.6	—	—	—	—	0.18	—	NA	NA	—	2.5 (U)	—	—
RE00-98-0054	00-10126	22.50–25.00	QBT4	15000	13 (UJ)	—	—	—	—	—	—	—	—	0.63 (U)	—	—	—	—	0.13 (U)	—	NA	NA	1.3 (U)	2.5 (U)	—	—
RE00-98-0056	00-10127	19.00–21.50	QBT4	—	13 (UJ)	2.9	—	—	—	—	—	—	—	0.63 (U)	—	—	—	—	0.13 (U)	—	NA	NA	0.63 (U)	2.5 (U)	—	—
RE00-98-0057	00-10127	22.50–25.00	QBT4	—	13 (UJ)	3	—	—	—	—	—	—	—	0.64 (U)	—	—	—	—	0.13 (U)	—	NA	NA	0.64 (U)	2.6 (U)	—	—
RE00-98-0059	00-10128	19.00–21.50	FILL	—	13 (UJ)	—	—	—	0.63 (U)	—	—	—	—	0.63 (U)	—	—	—	—	0.13 (U)	—	NA	NA	—	2.5 (U)	—	—
RE00-98-0060	00-10128	22.50–25.00	QBT4	—	12 (UJ)	3.9	—	—	—	—	—	—	—	0.62 (U)	—	—	—	—	0.12 (U)	—	NA	NA	0.62 (U)	2.5 (U)	—	—
RE00-98-0062	00-10129	19.50–22.00	FILL	—	12 (UJ)	—	—	—	0.61 (U)	—	—	—	—	0.61 (U)	—	—	—	—	0.12 (U)	—	NA	NA	—	2.4 (U)	—	—
RE00-98-0063	00-10129	22.50–25.00	QBT4	—	12 (UJ)	2.9	—	—	—	—	—	—	—	0.61 (U)	—	—	—	—	0.12 (U)	—	NA	NA	1.2 (U)	2.4 (U)	—	—
RE00-98-0065	00-10130	19.50–22.00	FILL	—	12 (UJ)	—	—	—	0.58 (U)	—	—	—	—	0.58 (U)	—	—	—	—	0.16	—	NA	NA	—	2.3 (U)	—	—
RE00-98-0066	00-10130	24.00–26.50	QBT4	—	12 (UJ)	—	—	—	—	—	—	—	—	0.58 (U)	—	—	—	—	0.12 (U)	—	NA	NA	1.2 (U)	2.3 (U)	—	—
RE00-98-0068	00-10131	20.50–23.00	FILL	—	13 (UJ)	—	—	—	0.66 (U)	—	—	—	—	0.66 (U)	—	—	—	—	2.9	—	NA	NA	—	2.6 (U)	—	—
RE00-98-0069	00-10131	25.00–27.50	QBT4	—	14 (UJ)	3.8	—	—	—	—	—	—	—	0.68 (U)	—	—	—	—	0.14 (U)	—	NA	NA	1.4 (U)	2.7 (U)	—	—
RE00-98-0072	00-10132	16.00–18.50	FILL	—	12 (UJ)	—	—	—	0.62 (U)	—	—	—	—	0.62 (U)	—	—	—	—	0.12 (U)	—	NA	NA	—	2.5 (U)	2.5 (U)	—
RE00-98-0073	00-10132	20.00–22.50	QBT4	16000	13 (UJ)	4	110	—	—	—	8.7	5.8	7	0.63 (U)	—	17	2200	—	0.13 (U)	—	NA	NA	1.3 (U)	2.5 (U)	2.5 (U)	18
RE00-98-0074	00-10133	15.00–17.50	SOIL	—	13 (UJ)	—	—	—	0.65 (U)	—	—	—	—	0.65 (U)	—	—	—	—	0.89	—	NA	NA	—	2.6 (U)	2.6 (U)	—
RE00-98-0076	00-10133	18.50–21.00	QBT4	—	12 (UJ)	—	—	—	—	—	—	—	—	0.6 (U)	—	—	—	—	—	—	NA	NA	1.2 (U)	2.4 (U)	2.4 (U)	—
RE00-98-0078	00-10134	15.00–17.50	SOIL	—	13 (UJ)	—	—	—	0.63 (U)	—	—	—	—	0.63 (U)	—	—	—	—	0.13 (U)	—	NA	NA	—	2.5 (U)	2.5 (U)	—
RE00-98-0079	00-10134	20.00–22.50	QBT4	12000	13 (UJ)	4.4	—	—	—	—	7.2	—	—	0.64 (U)	16000	—	1700	—	0.13 (U)	—	NA	NA	1.3 (U)	2.6 (U)	2.6 (U)	—
RE00-98-0083	00-10135	14.00–15.50	SOIL	—	12 (UJ)	—	—	—	0.62 (U)	—	—	—	—	0.62 (U)	—	—	—	—	0.12 (U)	—	NA	NA	—	2.5 (U)	2.5 (U)	—
RE00-98-0084	00-10135	20.00–22.50	QBT4	19000	13 (UJ)	3.7	120	1.3	—	2600	9.9	6.2	8.2	0.64 (U)	15000	17	2600	—	0.13 (U)	7.4	NA	NA	1.3 (U)	2.6 (U)	2.6 (U)	—
RE00-98-0085	00-10136	12.50–14.50	QBT4	19000	12 (UJ)	4	110	1.3	—	—	11	6.6	10	0.62 (U)	17000	19	2700	—	0.12 (U)	7.8	NA	NA	1.2 (U)	2.5 (U)	2.5 (U)	19
RE00-98-0086	00-10136	14.50–16.00	QBT4	19000	13 (UJ)	4.3	130	1.4	—	—	10	7.2	9.9	0.63 (U)	17000	21	2700	—	0.13 (U)	7.9	NA	NA	1.3 (U)	2.5 (U)	2.5 (U)	20
RE00-98-0087	00-10137	12.50–15.00	SOIL	—	12 (UJ)	—	—	—	0.6 (U)	—	—	—	—	0.6 (U)	—	—	—	—	0.12 (U)	—	NA	NA	—	2.4 (U)	2.4 (U)	—
RE00-98-0088	00-10137	16.00–18.50	QBT4	17000	13 (UJ)	3.7	120	—	—	2300	9.3	6.2	7.4	0.64 (U)	15000	18	2500	—	0.13 (U)	7.1	NA	NA	1.3 (U)	2.6 (U)	2.6 (U)	—
RE00-98-0089	00-10138	12.50–15.00	SOIL	—	12 (UJ)	—	—	—	0.6 (U)	—	—	—	—	0.6 (U)	—	—	—	—	0.12 (U)	—	NA	NA	—	2.4 (U)	2.4 (U)	—
RE00-98-0090	00-10138	15.00–17.50	QBT4	19000	13 (UJ)	3.7	78	1.4	—	2500	10	7	8.8	0.63 (U)	16000	15	2700	—	0.13 (U)	8.8	NA	NA	1.3 (U)	2.5 (U)	2.5 (U)	—
RE00-98-0091	00-10139	13.00–15.00	SOIL	—	12 (UJ)	—	—	—	0.6 (U)	—	—	—	—	0.6 (U)	—	—	—	—	0.12 (U)	—	NA	NA	—	2.4 (U)	2.4 (U)	—
RE00-98-0092	00-10139	15.00–17.50	QBT4	21000	12 (UJ)	3.8	130	1.6	—	2800	12	6	9.4	0.62 (U)	17000	14	3000	—	0.12 (U)	7.7	NA	NA	1.2 (U)	2.5 (U)	2.5 (U)	20
RE00-98-0093	00-10140	12.50–15.00	SOIL	—	13 (UJ)	—	—	—	0.64 (U)	—	—	—	—	0.64 (U)	—	—	—	—	0.13 (U)	—	NA	NA	—	2.6 (U)	2.6 (U)	—

Table 5.3-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Thallium	Vanadium
SOIL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**[b]	**na**	**1.52**	**1**	**0.73**	**39.6**
QBT2,QBT3,QBT4 Background Value				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14500**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**1.1**	**17**
SED Background Value[a]				**15400**	**0.83**	**3.98**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**0.82**	**13800**	**19.7**	**2370**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**0.73**	**19.7**
RE00-98-0094	00-10140	16.00–18.50	QBT4	—	12 (UJ)	3	—	—	—	—	—	—	—	0.6 (U)	—	—	—	—	0.12 (U)	—	NA	NA	1.2 (U)	2.4 (U)	2.4 (U)	—
RE00-98-0095	00-10141	7.50–9.00	SOIL	—	—	—	—	—	0.56 (U)	—	—	—	—	0.56 (U)	—	—	—	—	0.11 (U)	—	NA	NA	—	2.2 (U)	2.2 (U)	—
RE00-98-0099	00-10143	0.10–0.70	SED	—	12 (UJ)	—	—	—	0.59 (U)	—	—	—	—	—	—	74	—	—	0.12 (U)	—	NA	NA	1.2 (U)	2.4 (U)	2.4 (U)	—
RE00-98-0101	00-10144	1.00–2.00	SED	—	12 (UJ)	—	—	—	0.59 (U)	—	—	—	—	—	—	450	—	—	0.12 (U)	—	NA	NA	1.2 (U)	2.4 (U)	2.4 (U)	—
RE00-98-0103	00-10145	0.30–1.00	SED	—	12 (UJ)	—	—	—	0.6 (U)	—	—	—	—	—	—	93	—	—	0.12 (U)	—	NA	NA	1.2 (U)	2.4 (U)	2.4 (U)	—
RE00-98-0105	00-10146	0.20–1.00	SED	—	11 (UJ)	—	—	—	0.57 (U)	—	—	—	—	—	—	53	—	—	0.11 (U)	—	NA	NA	1.1 (U)	2.3 (U)	2.3 (U)	—
RE00-99-0004	00-10180	0.10–0.40	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	53	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE00-99-0005	00-10181	0.10–0.80	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	390	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE00-99-0006	00-10182	0.20–0.80	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE00-99-0007	00-10183	0.10–0.30	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	31	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE00-99-0008	00-10184	0.10–0.60	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE00-09-310	00-604247	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	27.8	—	—	—	—	—	—	0.59 (U)	—	—	—
RE00-09-311	00-604247	2.00–3.00	SED	—	—	—	—	—	0.49	—	—	—	—	—	—	20.4	—	—	—	—	—	—	0.56 (U)	1.2	—	—
RE00-09-312	00-604247	4.00–5.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	40.8	—	—	—	—	—	—	0.54 (U)	—	—	—
RE00-09-313	00-604248	1.25–2.25	QBT2	—	—	—	—	—	—	—	13.8 (J-)	—	—	0.53 (U)	—	112 (J-)	—	—	—	7.1 (J)	0.3	—	—	—	—	—
RE00-09-314	00-604248	3.25–4.25	QBT2	—	—	—	107 (J-)	—	—	—	11.3 (J-)	—	—	0.52 (U)	—	50 (J-)	—	—	—	6.6 (J)	0.59	—	—	—	—	—
RE00-09-315	00-604248	5.25–6.25	QBT2	—	—	—	61.9 (J-)	—	—	—	13.6 (J-)	—	—	0.54 (U)	—	16.2 (J-)	—	—	—	7.5 (J)	0.51	—	—	—	—	—
RE00-09-316	00-604249	2.00–3.00	QBT2	—	—	—	—	—	—	—	10.7 (J-)	—	—	0.62 (U)	—	—	—	—	—	—	5.2	—	—	—	—	—
RE00-09-317	00-604249	4.00–5.00	QBT2	—	—	—	—	—	—	—	—	—	—	0.6 (U)	—	13.8 (J-)	—	—	—	—	0.17 (J)	—	—	—	—	—
RE00-09-318	00-604249	6.00–7.00	QBT2	—	—	—	—	—	—	—	16.3 (J-)	—	—	0.61 (U)	—	—	—	—	—	8.5 (J)	0.17 (J)	—	—	—	—	—
RE00-09-319	00-604250	1.50–2.50	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	34 (J-)	—	—	—	—	—	—	—	—	—	—
RE00-09-320	00-604250	3.50–4.50	QBT3	—	—	—	—	—	—	2240	8.2 (J-)	—	—	0.52 (U)	—	13.9 (J-)	—	—	—	—	0.26	—	0.37 (J)	—	—	—
RE00-09-321	00-604250	5.50–6.50	QBT3	—	—	—	—	—	—	—	9.5 (J-)	—	—	0.53 (U)	—	43.3 (J-)	—	—	—	—	0.6	—	—	—	—	—
RE00-09-322	00-604251	2.75–3.75	QBT3	—	—	—	—	—	—	—	15.9 (J-)	—	—	0.53 (U)	—	20.3 (J-)	—	—	—	8.1 (J)	—	—	—	—	—	—
RE00-09-323	00-604251	4.75–5.75	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	28.5 (J-)	—	—	—	—	—	—	—	—	—	—
RE00-09-324	00-604251	6.75–7.75	QBT3	—	—	—	—	—	—	—	23.6 (J-)	—	—	0.54 (U)	—	20 (J-)	—	—	—	11.7 (J)	0.45	0.0079	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

[d] NA = Not analyzed.

Table 5.3-3
Organic Chemicals Detected at SWMU 00-017

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1254
RE00-98-0050	00-10125	18.50–19.00	FILL	0.11

Note: Results are in mg/kg.

Table 5.3-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 00-017

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-235/236
SOIL Background Value[a]				**0.013**[b]	**1.65**[b]	**0.023**[b]	**0.054**[b]	**na**[c]	**0.2**
QBT2,QBT3,QBT4 Background Value[a]				**na**	**na**	**na**	**na**	**na**	**0.09**
SED Background Value[a]				**0.04**	**0.9**	**0.006**	**0.068**	**0.093**	**0.2**
RE00-98-0050	00-10125	18.50–19.00	FILL	3.5	3.27	0.165	12.85	—[d]	—
RE00-98-0052	00-10125	19.00–19.50	QBT4	—	—	—	1.015	0.07	—
RE00-98-0053	00-10126	20.00–20.60	FILL	—	—	—	0.791	—	—
RE00-98-0054	00-10126	22.50–25.00	QBT4	—	—	—	—	—	0.1
RE00-98-0059	00-10128	19.00–21.50	FILL	—	0.25	—	0.068	—	—
RE00-98-0065	00-10130	19.50–22.00	FILL	—	—	0.062	3.25	—	—
RE00-98-0068	00-10131	20.50–23.00	FILL	1.33	0.106	0.066	2.82	—	—
RE00-98-0072	00-10132	16.00–18.50	FILL	—	—	—	0.176	—	—
RE00-98-0074	00-10133	15.00–17.50	SOIL	—	—	—	1.267	—	—
RE00-98-0089	00-10138	12.50–15.00	SOIL	—	—	—	—	0.22	—
RE00-98-0091	00-10139	13.00–15.00	SOIL	—	—	—	—	0.18	—
RE00-98-0095	00-10141	7.50–9.00	SOIL	—	—	—	—	0.09	—
RE00-98-0099	00-10143	0.1000–0.70	SED	—	—	—	—	0.17	—
RE00-98-0101	00-10144	1.00–2.00	SED	—	—	—	0.147	—	—
RE00-98-0103	00-10145	0.30–1.00	SED	—	—	—	0.107	0.13	—
RE00-98-0105	00-10146	0.20–1.00	SED	—	—	—	0.212	—	—
RE00-09-312	00-604247	4.00–5.00	SED	—	—	—	0.253	—	—
RE00-09-318	00-604249	6.00–7.00	QBT2	0.587	—	—	2.39	—	0.172
RE00-09-319	00-604250	1.50–2.50	QBT3	—	0.125	—	—	—	—
RE00-09-322	00-604251	2.75–3.75	QBT3	0.206	—	—	1.12	—	—
RE00-09-323	00-604251	4.75–5.75	QBT3	—	—	—	0.326	—	—
RE00-09-324	00-604251	6.75–7.75	QBT3	—	—	—	0.235	—	—

Notes: Results are in pCi/g.

[a] BVs/FVs are from LANL 1998, 059730.

[b] FV applies to samples collected from 0–0.5 ft only.

[c] na = Not available.

[d] — = Not detected or not detected above BV/FV.

Table 5.4-1
Samples Collected and Analyses Requested at AOC 00-031(a)

Sample ID	Location ID	Depth (ft)	Media	TAL Metals	SVOCs	TPH-DRO	TPH-GRO	VOCs
RE00-09-4250	00-604725	7.00–8.00	FILL	09-910	09-909	09-909	09-909	09-909
RE00-09-4251	00-604725	14.00–15.00	FILL	09-910	09-909	09-909	09-909	09-909
RE00-09-4252	00-604725	29.00–30.00	QBT3	09-910	09-909	09-909	09-909	09-909
RE00-09-4256	00-604726	7.00–8.00	FILL	09-910	09-909	09-909	09-909	09-909
RE00-09-4257	00-604726	14.00–15.00	FILL	09-910	09-909	09-909	09-909	09-909
RE00-09-4258	00-604726	29.00–30.00	QBT3	09-910	09-909	09-909	09-909	09-909
RE00-09-4260	00-604727	7.00–8.00	QBT3	09-910	09-909	09-909	09-909	09-909
RE00-09-4261	00-604727	14.00–15.00	QBT3	09-910	09-909	09-909	09-909	09-909
RE00-09-4262	00-604727	29.00–30.00	QBT3	09-910	09-909	09-909	09-909	09-909
RE00-09-4265	00-604728	7.00–8.00	FILL	09-910	09-909	09-909	09-909	09-909
RE00-09-4266	00-604728	14.00–15.00	FILL	09-910	09-909	09-909	09-909	09-909
RE00-09-4267	00-604728	29.00–30.00	QBT3	09-910	09-909	09-909	09-909	09-909
RE00-09-4270	00-604729	4.00–5.00	FILL	09-910	09-909	09-909	09-909	09-909
RE00-09-4271	00-604729	7.00–8.00	FILL	09-910	09-909	09-909	09-909	09-909
RE00-09-4272	00-604729	14.00–15.00	FILL	09-910	09-909	09-909	09-909	09-909
RE00-09-4273	00-604729	29.00–30.00	QBT3	09-910	09-909	09-909	09-909	09-909

Note: Numbers in analyte columns are request numbers.

Table 5.4-2
Inorganic Chemicals above BVs at AOC 00-031(a)

Sample ID	Location ID	Depth (ft)	Media	Calcium	Lead	Selenium
SOIL Background Value[a]				**6120**	**22.3**	**1.52**
QBT3 Background Value[a]				**2200**	**11.2**	**0.3**
SED Background Value[a]				**4420**	**19.7**	**0.3**
RE00-09-4252	00-604725	29.00–30.00	QBT3	—[b]	—	0.53 (U)
RE00-09-4257	00-604726	14.00–15.00	FILL	8070	—	—
RE00-09-4260	00-604727	7.00–8.00	QBT3	—	—	0.53 (U)
RE00-09-4261	00-604727	14.00–15.00	QBT3	—	—	0.53 (U)
RE00-09-4262	00-604727	29.00–30.00	QBT3	—	—	0.54 (U)
RE00-09-4266	00-604728	14.00–15.00	FILL	—	28.1	—
RE00-09-4267	00-604728	29.00–30.00	QBT3	—	—	0.54 (U)
RE00-09-4271	00-604729	7.00–8.00	FILL	8730	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] — = Not detected or not detected above BV.

Table 5.4-3
Organic Chemicals Detected at AOC 00-031(a)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Benzyl Alcohol	Bis(2-ethylhexyl)phthalate	Butanone[2-]	Butylbenzene[sec-]	Carbon Disulfide	Di-n-butylphthalate	Ethylbenzene	Isopropylbenzene	Isopropyltoluene[4-]
RE00-09-4250	00-604725	7.00–8.00	FILL	—*	—	—	—	—	—	—	—	—	—
RE00-09-4251	00-604725	14.00–15.00	FILL	—	—	—	—	—	—	—	—	—	—
RE00-09-4252	00-604725	29.00–30.00	QBT3	—	0.054 (J)	—	—	—	—	—	—	—	—
RE00-09-4257	00-604726	14.00–15.00	FILL	—	—	—	—	—	—	—	—	—	—
RE00-09-4258	00-604726	29.00–30.00	QBT3	—	—	—	—	—	—	—	—	—	—
RE00-09-4260	00-604727	7.00–8.00	QBT3	—	—	—	—	—	—	—	—	—	—
RE00-09-4261	00-604727	14.00–15.00	QBT3	—	0.06 (J)	—	—	—	—	—	—	—	0.0002 (J)
RE00-09-4262	00-604727	29.00–30.00	QBT3	—	—	—	—	—	—	0.046 (J)	—	—	—
RE00-09-4265	00-604728	7.00–8.00	FILL	—	—	—	—	0.016	—	—	0.00085 (J)	0.0035 (J)	0.042
RE00-09-4266	00-604728	14.00–15.00	FILL	—	—	0.13 (J)	—	—	—	—	—	—	0.0018 (J)
RE00-09-4267	00-604728	29.00–30.00	QBT3	—	—	—	—	—	—	—	—	—	0.00053 (J)
RE00-09-4270	00-604729	4.00–5.00	FILL	0.054	—	—	0.0062 (J)	—	0.00025 (J)	—	—	—	—
RE00-09-4271	00-604729	7.00–8.00	FILL	—	—	—	—	—	—	—	—	—	—
RE00-09-4272	00-604729	14.00–15.00	FILL	—	—	—	—	—	—	—	—	—	—
RE00-09-4273	00-604729	29.00–30.00	QBT3	—	—	—	—	—	—	—	—	—	—

Table 5.4-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Pentachlorophenol	Propylbenzene[1-]	Total Petroleum Hydrocarbons Gasoline Range Org.	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)
RE00-09-4250	00-604725	7.00–8.00	FILL	—	—	—	—	—	—	0.0007 (J)	—	—	—
RE00-09-4251	00-604725	14.00–15.00	FILL	—	—	—	0.49 (J)	—	—	—	—	—	—
RE00-09-4252	00-604725	29.00–30.00	QBT3	0.039	—	—	—	—	—	—	—	0.00028 (J)	—
RE00-09-4257	00-604726	14.00–15.00	FILL	0.028	—	—	—	—	—	—	—	—	—
RE00-09-4258	00-604726	29.00–30.00	QBT3	—	—	—	—	—	—	0.00092 (J)	—	—	—
RE00-09-4260	00-604727	7.00–8.00	QBT3	—	—	—	—	—	—	0.00061 (J)	0.00066 (J)	—	—
RE00-09-4261	00-604727	14.00–15.00	QBT3	0.028	—	—	—	—	—	—	—	0.0015 (J)	—
RE00-09-4262	00-604727	29.00–30.00	QBT3	—	—	—	—	—	—	0.00057 (J)	0.00057 (J)	—	—
RE00-09-4265	00-604728	7.00–8.00	FILL	0.031	0.29 (J)	0.11 (J)	—	—	0.18 (J+)	—	0.15	0.23	0.013
RE00-09-4266	00-604728	14.00–15.00	FILL	0.032	0.14 (J)	0.081 (J)	—	0.00046 (J)	—	—	—	0.0056 (J)	—
RE00-09-4267	00-604728	29.00–30.00	QBT3	0.039	—	—	—	—	—	—	—	0.0055	0.00057 (J)
RE00-09-4270	00-604729	4.00–5.00	FILL	0.041	—	—	—	—	—	—	—	—	—
RE00-09-4271	00-604729	7.00–8.00	FILL	—	—	—	—	—	—	0.00058 (J)	0.00066 (J)	—	—
RE00-09-4272	00-604729	14.00–15.00	FILL	—	—	—	—	—	—	—	0.00059 (J)	—	—
RE00-09-4273	00-604729	29.00–30.00	QBT3	0.028	—	—	—	—	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.3-1
Samples Collected and Analyses Requested at SWMU 01-001(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-15637	00-603748	1.50–2.50	QBT3	09-561	09-560	09-561	09-561	09-561	09-561	09-560	09-559	09-560	09-561	09-559	09-559	09-560
RE00-08-15638	00-603748	3.50–4.50	QBT3	09-561	09-560	09-561	09-561	09-561	09-561	09-560	09-559	09-560	09-561	09-559	09-559	09-560
RE00-08-15639	00-603749	2.00–3.00	QBT3	09-561	09-560	09-561	09-561	09-561	09-561	09-560	09-559	09-560	09-561	09-559	09-559	09-560
RE00-08-15640	00-603749	4.00–5.00	QBT3	09-561	09-560	09-561	09-561	09-561	09-561	09-560	09-559	09-560	09-561	09-559	09-559	09-560
RE00-08-15641	00-603750	3.75–4.75	QBT3	09-561	09-560	09-561	09-561	09-561	09-561	09-560	09-559	09-560	09-561	09-559	09-559	09-560
RE00-08-15642	00-603750	5.75–6.75	QBT3	09-561	09-560	09-561	09-561	09-561	09-561	09-560	09-559	09-560	09-561	09-559	09-559	09-560
RE00-08-15643	00-603751	6.00–7.00	QBT3	09-578	09-578	09-578	09-578	09-578	09-578	09-578	09-578	09-578	09-578	09-578	09-578	09-578
RE00-08-15644	00-603751	10.00–11.00	QBT3	09-578	09-578	09-578	09-578	09-578	09-578	09-578	09-578	09-578	09-578	09-578	09-578	09-578
RE00-08-15645	00-603752	0.00–1.00	SED	09-708	09-707	09-708	09-708	09-708	09-708	09-707	09-706	09-707	09-708	09-706	09-706	09-707
RE00-08-15646	00-603752	3.75–4.75	QBT3	09-708	09-707	09-708	09-708	09-708	09-708	09-707	09-706	09-707	09-708	09-706	09-706	09-707
RE00-08-15647	00-603753	0.00–1.00	SED	09-708	09-707	09-708	09-708	09-708	09-708	09-707	09-706	09-707	09-708	09-706	09-706	09-707
RE00-08-15648	00-603753	1.00–2.00	QBT3	09-708	09-707	09-708	09-708	09-708	09-708	09-707	09-706	09-707	09-708	09-706	09-706	09-707
RE00-08-15649	00-603754	0.00–1.00	SED	09-708	09-707	09-708	09-708	09-708	09-708	09-707	09-706	09-707	09-708	09-706	09-706	09-707
RE00-08-15650	00-603754	2.00–3.00	QBT3	09-708	09-707	09-708	09-708	09-708	09-708	09-707	09-706	09-707	09-708	09-706	09-706	09-707
RE00-08-15663	00-603761	0.00–1.00	SED	09-585	09-585	09-585	09-585	09-585	09-585	09-585	09-585	09-585	09-585	09-585	09-585	09-585
RE00-08-15664	00-603761	1.50–2.50	FILL	09-585	09-585	09-585	09-585	09-585	09-585	09-585	09-585	09-585	09-585	09-585	09-585	09-585
RE00-08-15665	00-603761	4.00–5.00	QBT3	09-585	09-585	09-585	09-585	09-585	09-585	09-585	09-585	09-585	09-585	09-585	09-585	09-585

Note: Numbers in analyte columns are request numbers.

Table 6.3-2
Inorganic Chemicals above BVs at SWMU 01-001(a)

Sample ID	Location ID	Depth (ft)	Media	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium
SOIL Background Value[a]				**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**22.3**	**15.4**	**na**[b]	**na**	**1.52**	**1**	**39.6**
QBT3 Background Value[a]				**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**11.2**	**6.58**	**na**	**na**	**0.3**	**1**	**17**
SED Background Value[a]				**127**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**0.82**	**19.7**	**9.38**	**na**	**na**	**0.3**	**1**	**19.7**
RE00-08-15637	00-603748	1.50–2.50	QBT3	—[c]	—	—	7.6 (J)	—	—	—	17.2	—	—	—	0.59 (U)	—	—
RE00-08-15638	00-603748	3.50–4.50	QBT3	—	—	—	15 (J)	—	—	—	—	9.2 (J)	—	—	0.59 (U)	—	—
RE00-08-15639	00-603749	2.00–3.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	0.59 (U)	—	—
RE00-08-15640	00-603749	4.00–5.00	QBT3	—	—	—	28.1 (J)	—	—	—	16.7	14.3 (J)	0.55	—	0.64 (U)	—	—
RE00-08-15641	00-603750	3.75–4.75	QBT3	—	—	—	32.4 (J)	—	—	—	—	16.4 (J)	—	—	—	—	—
RE00-08-15642	00-603750	5.75–6.75	QBT3	—	—	—	38 (J)	—	—	—	—	19.5 (J)	0.09 (J)	—	—	—	—
RE00-08-15643	00-603751	6.00–7.00	QBT3	—	—	—	52.6 (J)	—	—	0.51 (U)	—	25.9 (J-)	—	—	—	—	—
RE00-08-15644	00-603751	10.00–11.00	QBT3	—	—	—	52.1 (J)	—	—	—	—	26.3 (J-)	—	—	—	—	—
RE00-08-15645	00-603752	0.00–1.00	SED	133	—	—	—	—	—	—	—	—	0.28	—	0.58 (U)	—	22 (J)
RE00-08-15646	00-603752	3.75–4.75	QBT3	47	4.9	—	10.1 (J+)	—	13.6	—	—	7.7	0.19 (J)	—	—	10.9	—
RE00-08-15647	00-603753	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	0.25	—	—	—	—
RE00-08-15648	00-603753	1.00–2.00	QBT3	—	2.2	—	11.2 (J+)	—	8	—	—	8.2	0.12 (J)	—	—	4.6	—
RE00-08-15649	00-603754	0.00–1.00	SED	181	—	—	—	5.4	—	—	—	—	—	—	0.59 (U)	—	21.6 (J)
RE00-08-15650	00-603754	2.00–3.00	QBT3	—	—	—	—	—	5.2	0.54 (U)	—	—	0.34	—	—	1.7	—
RE00-08-15663	00-603761	0.00–1.00	SED	133 (J+)	—	—	—	—	—	—	—	—	0.23	—	0.59 (U)	—	—
RE00-08-15664	00-603761	1.50–2.50	FILL	—	—	—	—	—	—	0.54 (U)	—	—	0.88	0.0045 (J)	—	—	—
RE00-08-15665	00-603761	4.00–5.00	QBT3	63.7 (J+)	—	3740 (J)	38.8 (J)	—	9.4 (J)	0.52 (U)	13.3	21.6 (J)	0.4	0.0022 (J)	0.52 (U)	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.3-3
Organic Chemicals Detected at SWMU 01-001(a)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Chrysene	Di-n-octylphthalate	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Phenanthrene	Pyrene
RE00-08-15637	00-603748	1.50–2.50	QBT3	0.082 (J)	—*	0.14 (J)	—	—	0.16 (J)	0.14 (J)	0.1 (J)	0.049 (J)	0.13 (J)	—	0.16 (J)	—	0.36 (J)	0.071 (J)	0.047 (J)	0.004 (J)	0.44	0.34 (J)
RE00-08-15638	00-603748	3.50–4.50	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0056 (J)	—	—
RE00-08-15639	00-603749	2.00–3.00	QBT3	—	—	—	0.13 (J)	—	—	—	—	—	—	—	—	—	—	—	—	0.0057 (J)	—	—
RE00-08-15640	00-603749	4.00–5.00	QBT3	—	0.0025 (J)	—	0.018 (J)	—	—	—	—	—	—	0.061 (J)	—	—	—	—	—	0.0058 (J)	—	—
RE00-08-15641	00-603750	3.75–4.75	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0056 (J)	—	—
RE00-08-15642	00-603750	5.75–6.75	QBT3	—	—	—	0.019 (J)	—	—	—	—	—	—	—	—	—	—	—	—	0.0042 (J)	—	—
RE00-08-15643	00-603751	6.00–7.00	QBT3	—	0.0034 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.002 (J)	—	—
RE00-08-15644	00-603751	10.00–11.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.16 (J)	—	—	—	0.0033 (J)	—	—
RE00-08-15645	00-603752	0.00–1.00	SED	—	—	—	0.0063 (J)	0.0063 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15646	00-603752	3.75–4.75	QBT3	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—
RE00-08-15647	00-603753	0.00–1.00	SED	—	—	—	0.0082 (J)	0.0082 (J)	—	—	—	—	—	0.29 (J)	—	—	—	—	—	—	—	—
RE00-08-15648	00-603753	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.082 (J)	—	—	—	—	—	—	—	—
RE00-08-15649	00-603754	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	0.17 (J)	—	—	—	—	—	—	—	—
RE00-08-15650	00-603754	2.00–3.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.062 (J)	—	—	—	—	—	—	—	—
RE00-08-15663	00-603761	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0021 (J)	—	—
RE00-08-15664	00-603761	1.50–2.50	FILL	—	—	—	—	—	—	—	—	—	—	0.075 (J)	0.071 (J)	—	—	—	—	—	—	—
RE00-08-15665	00-603761	4.00–5.00	QBT3	—	0.002 (J)	—	—	0.011 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.3-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 01-001(a)

Sample ID	Location ID	Depth (ft)	Media	Plutonium-239/240
QBT3 Background Value				**na***
RE00-08-15644	00-603751	10.00–11.00	QBT3	0.164

Note: Results are in pCi/g.
* na = Not available.

Table 6.4-1
Samples Collected and Analyses Requested at SWMU 01-001(b)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-15675	00-603762	2.00–3.50	QBT3	09-695	09-694	09-695	09-695	09-695	09-695	09-694	09-693	09-694	09-695	09-693	09-693	09-694
RE00-08-15676	00-603762	4.00–5.50	QBT3	09-695	09-694	09-695	09-695	09-695	09-695	09-694	09-693	09-694	09-695	09-693	09-693	09-694
RE00-08-15702	00-603762	6.50–7.50	QBT3	09-1258	09-1257	09-1258	09-1258	09-1258	09-1258	09-1257	09-1259	09-1257	09-1258	09-1259	09-1259	09-1257
RE00-08-15703	00-603762	9.00–10.00	QBT3	09-1258	09-1257	09-1258	09-1258	09-1258	09-1258	09-1257	09-1259	09-1257	09-1258	09-1259	09-1259	09-1257
RE00-08-15677	00-603763	1.25–2.25	QBT3	09-705	09-705	09-705	09-705	09-705	09-705	09-705	09-705	09-705	09-705	09-705	09-705	09-705
RE00-08-15678	00-603763	3.25–4.25	QBT3	09-705	09-705	09-705	09-705	09-705	09-705	09-705	09-705	09-705	09-705	09-705	09-705	09-705
RE00-08-15679	00-603764	1.00–2.25	QBT3	09-588	09-587	09-588	09-588	09-588	09-588	09-587	09-586	09-587	09-588	09-586	09-586	09-587
RE00-08-15680	00-603764	5.00–6.00	QBT3	09-588	09-587	09-588	09-588	09-588	09-588	09-587	09-586	09-587	09-588	09-586	09-586	09-587
RE00-08-15681	00-603765	0.00–1.00	SED	09-588	09-587	09-588	09-588	09-588	09-588	09-587	09-586	09-587	09-588	09-586	09-586	09-587
RE00-08-15682	00-603765	1.50–2.50	QBT3	09-588	09-587	09-588	09-588	09-588	09-588	09-587	09-586	09-587	09-588	09-586	09-586	09-587
RE00-08-15701	00-603765	4.00–5.00	QBT3	09-588	09-587	09-588	09-588	09-588	09-588	09-587	09-586	09-587	09-588	09-586	09-586	09-587
RE00-08-15683	00-603766	0.00–1.00	SED	09-588	09-587	09-588	09-588	09-588	09-588	09-587	09-586	09-587	09-588	09-586	09-586	09-587
RE00-08-15684	00-603766	1.50–2.50	QBT3	09-588	09-587	09-588	09-588	09-588	09-588	09-587	09-586	09-587	09-588	09-586	09-586	09-587
RE00-08-15685	00-603767	0.00–1.00	SED	09-588	09-587	09-588	09-588	09-588	09-588	09-587	09-586	09-587	09-588	09-586	09-586	09-587
RE00-08-15686	00-603767	1.00–2.00	QBT3	09-588	09-587	09-588	09-588	09-588	09-588	09-587	09-586	09-587	09-588	09-586	09-586	09-587
RE00-08-15687	00-603768	0.00–1.00	SED	09-588	09-587	09-588	09-588	09-588	09-588	09-587	09-586	09-587	09-588	09-586	09-586	09-587
RE00-08-15688	00-603768	1.50–2.50	QBT3	09-588	09-587	09-588	09-588	09-588	09-588	09-587	09-586	09-587	09-588	09-586	09-586	09-587
RE00-08-15689	00-603769	0.00–1.00	SED	09-1258	09-1257	09-1258	09-1258	09-1258	09-1258	09-1257	09-1259	09-1257	09-1258	09-1259	09-1259	09-1257
RE00-08-15690	00-603769	1.00–2.00	QBT3	09-1258	09-1257	09-1258	09-1258	09-1258	09-1258	09-1257	09-1259	09-1257	09-1258	09-1259	09-1259	09-1257
RE00-08-15691	00-603770	0.00–1.00	SED	09-1258	09-1257	09-1258	09-1258	09-1258	09-1258	09-1257	09-1259	09-1257	09-1258	09-1259	09-1259	09-1257
RE00-08-15692	00-603770	1.00–2.00	QBT3	09-1258	09-1257	09-1258	09-1258	09-1258	09-1258	09-1257	09-1259	09-1257	09-1258	09-1259	09-1259	09-1257
RE00-08-15693	00-603771	0.00–1.00	SED	09-1258	09-1257	09-1258	09-1258	09-1258	09-1258	09-1257	09-1259	09-1257	09-1258	09-1259	09-1259	09-1257
RE00-08-15694	00-603771	1.25–2.25	QBT3	09-1258	09-1257	09-1258	09-1258	09-1258	09-1258	09-1257	09-1259	09-1257	09-1258	09-1259	09-1259	09-1257

Note: Numbers in analyte columns are request numbers.

Table 6.4-2
Inorganic Chemicals above BVs at SWMU 01-001(b)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Chromium	Copper	Cyanide (Total)	Lead	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver
QBT3 Background Value[a]				**0.5**	**1.63**	**7.14**	**4.66**	**0.5**	**11.2**	**0.1**	**6.58**	**na**[b]	**na**	**0.3**	**1**
SED Background Value[a]				**0.83**	**0.4**	**10.5**	**11.2**	**0.82**	**19.7**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**
RE00-08-15675	00-603762	2.00–3.50	QBT3	—[c]	5.7	—	51.3 (J+)	—	—	—	12.4	0.48	—	—	13.1
RE00-08-15676	00-603762	4.00–5.50	QBT3	—	6.5	—	20.3 (J+)	—	—	—	6.9	0.42	—	0.35 (J)	15
RE00-08-15702	00-603762	6.50–7.50	QBT3	—	—	15 (J)	—	—	—	—	8	—	—	0.58 (U)	—
RE00-08-15703	00-603762	9.00–10.00	QBT3	—	—	11.1 (J)	8.6	—	—	—	7.5	0.19 (J)	—	—	—
RE00-08-15677	00-603763	1.25–2.25	QBT3	—	8.1	—	19.1	0.56 (U)	—	—	—	0.53	—	—	17.9
RE00-08-15678	00-603763	3.25–4.25	QBT3	0.56 (U)	—	—	7.8	—	—	—	—	0.71	—	—	3.1
RE00-08-15679	00-603764	1.00–2.25	QBT3	—	—	—	—	—	—	—	—	0.15 (J)	0.0023 (J)	—	—
RE00-08-15680	00-603764	5.00–6.00	QBT3	—	—	13.4 (J)	—	—	—	—	7.1	0.17 (J)	—	0.52 (U)	—
RE00-08-15681	00-603765	0.00–1.00	SED	—	—	—	—	—	—	—	—	9.6	—	—	—
RE00-08-15682	00-603765	1.50–2.50	QBT3	—	—	41.7 (J)	—	—	—	—	20.4 (J)	1.9	—	—	—
RE00-08-15701	00-603765	4.00–5.00	QBT3	—	—	67.9	—	—	—	—	33.1	0.25	—	—	—
RE00-08-15683	00-603766	0.00–1.00	SED	—	—	20.7 (J)	—	—	23.1	0.215	13.9 (J)	12.5	—	—	—
RE00-08-15684	00-603766	1.50–2.50	QBT3	—	—	—	—	0.54 (U)	—	—	—	0.44	—	—	—
RE00-08-15685	00-603767	0.00–1.00	SED	—	—	—	—	—	—	—	—	22.7	—	—	—
RE00-08-15686	00-603767	1.00–2.00	QBT3	—	—	13.2 (J)	—	—	—	—	6.6 (J)	6.9	—	—	—
RE00-08-15687	00-603768	0.00–1.00	SED	—	—	—	—	—	—	—	—	8.8	—	—	—
RE00-08-15688	00-603768	1.50–2.50	QBT3	—	—	—	—	—	—	—	—	10.4	—	0.53 (U)	—
RE00-08-15689	00-603769	0.00–1.00	SED	—	—	—	—	—	—	—	—	0.23	—	0.51 (U)	—
RE00-08-15690	00-603769	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.51 (U)	—
RE00-08-15691	00-603770	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	0.51 (U)	—
RE00-08-15693	00-603771	0.00–1.00	SED	—	—	—	—	—	—	—	—	0.69	—	—	—
RE00-08-15694	00-603771	1.25–2.25	QBT3	—	—	—	—	—	—	—	—	0.096 (J)	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.4-3
Organic Chemicals Detected at SWMU 01-001(b)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Aroclor-1254	Bis(2-ethylhexyl)phthalate	Bromomethane	Isopropyltoluene[4-]	Methylene Chloride
RE00-08-15702	00-603762	6.50–7.50	QBT3	—*	—	—	0.00069 (J)	—	—
RE00-08-15679	00-603764	1.00–2.25	QBT3	0.0055 (J)	—	—	—	0.00032 (J)	—
RE00-08-15680	00-603764	5.00–6.00	QBT3	0.0045 (J)	—	0.29 (J)	—	—	0.00082 (J)
RE00-08-15681	00-603765	0.00–1.00	SED	—	0.013 (J)	—	—	—	0.011
RE00-08-15682	00-603765	1.50–2.50	QBT3	—	0.0062 (J)	—	—	—	0.0016 (J)
RE00-08-15701	00-603765	4.00–5.00	QBT3	—	—	—	—	—	0.014
RE00-08-15683	00-603766	0.00–1.00	SED	—	0.13 (J)	—	—	—	0.0028 (J)
RE00-08-15684	00-603766	1.50–2.50	QBT3	—	0.012 (J)	—	—	—	0.015
RE00-08-15685	00-603767	0.00–1.00	SED	—	—	—	—	—	0.0012 (J)
RE00-08-15686	00-603767	1.00–2.00	QBT3	—	—	—	—	—	0.016
RE00-08-15687	00-603768	0.00–1.00	SED	—	—	—	—	—	0.0052 (J)
RE00-08-15688	00-603768	1.50–2.50	QBT3	—	—	—	—	—	0.0098
RE00-08-15689	00-603769	0.00–1.00	SED	0.0028 (J)	—	—	—	—	—
RE00-08-15693	00-603771	0.00–1.00	SED	0.0027 (J)	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

* — = Not detected.

Table 6.4-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 01-001(b)

Sample ID	Location ID	Depth (ft)	Media	Cesium-134	Plutonium-238	Plutonium-239/240	Uranium-234	Uranium-235/236
SED Background Value[a]				**na**[b]	**0.006**	**0.068**	**2.59**	**0.2**
QBT3 Background Value[a]				**na**	**na**	**na**	**1.98**	**0.09**
RE00-08-15678	00-603763	3.25–4.25	QBT3	0.054	—[c]	—	—	—
RE00-08-15683	00-603766	0.00–1.00	SED	—	—	—	2.96	—
RE00-08-15684	00-603766	1.50–2.50	QBT3	—	—	—	—	0.14
RE00-08-15693	00-603771	0.00–1.00	SED	—	0.129	0.198	—	—

Note: Results are in pCi/g.

[a] BVs/FVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV/FV.

Table 6.5-1
Samples Collected and Analyses Requested at SWMU 01-001(c)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-15715	00-603775	12.00–13.00	QBT3	09-880	09-879	09-880	09-880	09-880	09-880	09-879	09-878	09-879	09-880	09-878	09-878	09-879
RE00-08-15716	00-603775	14.00–15.00	QBT3	09-880	09-879	09-880	09-880	09-880	09-880	09-879	09-878	09-879	09-880	09-878	09-878	09-879
RE00-08-15719	00-603777	0.00–1.00	SED	09-121	09-120	09-121	09-121	09-121	09-121	09-120	09-119	09-120	09-121	09-119	09-119	09-120
RE00-08-15720	00-603777	1.50–2.50	QBT3	09-121	09-120	09-121	09-121	09-121	09-121	09-120	09-119	09-120	09-121	09-119	09-119	09-120
RE00-08-15763	00-603777	4.00–5.25	QBT3	09-121	09-120	09-121	09-121	09-121	09-121	09-120	09-119	09-120	09-121	09-119	09-119	09-120
RE00-08-15721	00-603778	0.00–1.50	QBT3	09-92	09-91	09-92	09-92	09-92	09-92	09-91	09-90	09-91	09-92	09-90	09-90	09-91
RE00-08-15722	00-603778	1.50–2.50	QBT3	09-92	09-91	09-92	09-92	09-92	09-92	09-91	09-90	09-91	09-92	09-90	09-90	09-91
RE00-08-15723	00-603779	0.00–1.50	SED	09-92	09-91	09-92	09-92	09-92	09-92	09-91	09-90	09-91	09-92	09-90	09-90	09-91
RE00-08-15724	00-603779	1.50–2.50	QBT3	09-92	09-91	09-92	09-92	09-92	09-92	09-91	09-90	09-91	09-92	09-90	09-90	09-91
RE00-08-15725	00-603780	0.00–1.00	SED	09-121	09-120	09-121	09-121	09-121	09-121	09-120	09-119	09-120	09-121	09-119	09-119	09-120
RE00-08-15726	00-603780	1.00–2.00	QBT3	09-121	09-120	09-121	09-121	09-121	09-121	09-120	09-119	09-120	09-121	09-119	09-119	09-120

Note: Numbers in analyte columns are request numbers.

Table 6.5-2
Inorganic Chemicals above BVs at SWMU 01-001(c)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Thallium	Vanadium
QBT3 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14500**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**na**[b]	**na**	**0.3**	**1.1**	**17**
SED Background Value[a]				**15400**	**0.83**	**3.98**	**127**	**1.31**	**4420**	**10.5**	**4.73**	**11.2**	**0.82**	**13800**	**19.7**	**2370**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**0.73**	**19.7**
RE00-08-15715	00-603775	12.00–13.00	QBT3	23600 (J)	0.72 (U)	7.8 (J+)	124	2.8	5790	16.7 (J+)	3.4	22.5	—[c]	19100	33.2 (J+)	5520	—	—	21.7	11	—	1.7 (U)	2 (J+)	29.3
RE00-08-15716	00-603775	14.00–15.00	QBT3	19700 (J)	0.56 (U)	6.2 (J+)	69.9	2.8	4750	12.1 (J+)	3.3	16.7	0.63 (UJ)	—	24.8 (J+)	4500	—	—	15.8	6.9	—	0.65 (J)	1.5 (U)	23.7
RE00-08-15720	00-603777	1.50–2.50	QBT3	—	—	—	—	—	—	—	—	—	0.51 (U)	—	—	—	—	—	—	—	—	0.31 (J)	—	—
RE00-08-15763	00-603777	4.00–5.25	QBT3	—	—	—	—	—	—	9.6	—	—	—	—	—	—	—	—	—	—	—	0.5 (U)	—	—
RE00-08-15721	00-603778	0.00–1.50	QBT3	—	—	—	—	—	—	—	—	4.7	0.52 (U)	—	—	—	—	—	—	0.4	—	0.36 (J)	—	—
RE00-08-15722	00-603778	1.50–2.50	QBT3	—	—	—	—	—	—	—	—	5.3	—	—	—	—	556	—	—	—	0.0027 (J)	0.52	—	—
RE00-08-15723	00-603779	0.00–1.50	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.342 (J)	—	0.15 (J)	—	0.52 (U)	—	—
RE00-08-15724	00-603779	1.50–2.50	QBT3	—	0.51 (UJ)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.51 (U)	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.5-3
Organic Chemicals Detected at SWMU 01-001(c)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1260	Benzyl Alcohol	Butylbenzene[tert-]	Di-n-butylphthalate	Isopropylbenzene	Trimethylbenzene[1,2,4-]
RE00-08-15715	00-603775	12.00–13.00	QBT3	0.21	—*	0.00015 (J)	—	0.00014 (J)	—
RE00-08-15716	00-603775	14.00–15.00	QBT3	—	0.057 (J)	—	—	—	—
RE00-08-15722	00-603778	1.50–2.50	QBT3	—	—	—	—	—	0.00043 (J)
RE00-08-15723	00-603779	0.00–1.50	SED	0.031 (J)	—	—	—	—	—
RE00-08-15725	00-603780	0.00–1.00	SED	—	—	—	0.049 (J)	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.5-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 01-001(c)

Sample ID	Location ID	Depth (ft)	Media	Plutonium-239/240	Tritium
QBT3 Background Value[a]				**na**[b]	**na**
SED Background Value[a]				**0.068**	**0.093**
RE00-08-15716	00-603775	14.00–15.00	QBT3	—[c]	2.07
RE00-08-15719	00-603777	0.00–1.00	SED	0.499 (J)	—
RE00-08-15721	00-603778	0.00–1.50	QBT3	1.73	—
RE00-08-15722	00-603778	1.50–2.50	QBT3	0.145	—
RE00-08-15723	00-603779	0.00–1.50	SED	7.24	—
RE00-08-15724	00-603779	1.50–2.50	QBT3	0.182	—
RE00-08-15725	00-603780	0.00–1.00	SED	5.49	—
RE00-08-15726	00-603780	1.00–2.00	QBT3	0.301 (J)	—

Notes: Results are in pCi/g. Data qualifiers are presented in Appendix A.

[a] BVs/FVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above FV.

Table 6.6-1
Samples Collected and Analyses Requested at SWMUs 01-001(d) and 01-006(h)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-15788	00-603799	3.50–5.00	FILL	09-881	09-881	09-881	09-881	09-881	09-881	09-881	09-881	09-881	09-881	09-881	09-881	09-881
RE00-08-15789	00-603799	6.00–7.50	QBT3	09-881	09-881	09-881	09-881	09-881	09-881	09-881	09-881	09-881	09-881	09-881	09-881	09-881
RE00-08-15790	00-603800	0.00–1.00	SED	09-152	09-151	09-152	09-152	09-152	09-152	09-151	09-150	09-151	09-152	09-150	09-150	09-151
RE00-08-15791	00-603800	2.75–3.75	QBT3	09-152	09-151	09-152	09-152	09-152	09-152	09-151	09-150	09-151	09-152	09-150	09-150	09-151
RE00-08-15792	00-603801	0.00–1.00	SED	09-152	09-151	09-152	09-152	09-152	09-152	09-151	09-150	09-151	09-152	09-150	09-150	09-151
RE00-08-15793	00-603801	2.50–3.50	QBT3	09-152	09-151	09-152	09-152	09-152	09-152	09-151	09-150	09-151	09-152	09-150	09-150	09-151
RE00-08-15794	00-603802	0.00–1.00	SED	09-152	09-151	09-152	09-152	09-152	09-152	09-151	09-150	09-151	09-152	09-150	09-150	09-151
RE00-08-15795	00-603802	3.75–4.75	QBT3	09-152	09-151	09-152	09-152	09-152	09-152	09-151	09-150	09-151	09-152	09-150	09-150	09-151
RE00-08-15796	00-603803	0.00–1.00	SED	09-152	09-151	09-152	09-152	09-152	09-152	09-151	09-150	09-151	09-152	09-150	09-150	09-151
RE00-08-15797	00-603803	1.00–2.00	QBT3	09-152	09-151	09-152	09-152	09-152	09-152	09-151	09-150	09-151	09-152	09-150	09-150	09-151
RE00-08-15798	00-603804	0.00–1.00	SED	09-152	09-151	09-152	09-152	09-152	09-152	09-151	09-150	09-151	09-152	09-150	09-150	09-151
RE00-08-15799	00-603804	1.00–2.00	QBT3	09-152	09-151	09-152	09-152	09-152	09-152	09-151	09-150	09-151	09-152	09-150	09-150	09-151
RE00-08-15800	00-603805	0.00–1.00	QBT3	09-152	09-151	09-152	09-152	09-152	09-152	09-151	09-150	09-151	09-152	09-150	09-150	09-151
RE00-08-15801	00-603805	1.00–2.00	QBT3	09-152	09-151	09-152	09-152	09-152	09-152	09-151	09-150	09-151	09-152	09-150	09-150	09-151
RE00-08-15802	00-603806	0.00–1.25	SED	09-132	09-131	09-132	09-132	09-132	09-132	09-131	09-130	09-131	09-132	09-130	09-130	09-131
RE00-08-15803	00-603806	1.25–2.25	QBT3	09-132	09-131	09-132	09-132	09-132	09-132	09-131	09-130	09-131	09-132	09-130	09-130	09-131
RE00-08-15804	00-603807	0.00–1.00	SOIL	09-132	09-131	09-132	09-132	09-132	09-132	09-131	09-130	09-131	09-132	09-130	09-130	09-131
RE00-08-15805	00-603807	1.00–2.00	QBT3	09-132	09-131	09-132	09-132	09-132	09-132	09-131	09-130	09-131	09-132	09-130	09-130	09-131
RE00-08-15806	00-603808	0.00–1.25	QBT3	09-132	09-131	09-132	09-132	09-132	09-132	09-131	09-130	09-131	09-132	09-130	09-130	09-131
RE00-08-15807	00-603808	1.25–2.25	QBT3	09-132	09-131	09-132	09-132	09-132	09-132	09-131	09-130	09-131	09-132	09-130	09-130	09-131
RE00-08-15808	00-603809	0.00–1.00	SOIL	09-132	09-131	09-132	09-132	09-132	09-132	09-131	09-130	09-131	09-132	09-130	09-130	09-131
RE00-08-15809	00-603809	1.00–2.00	QBT3	09-132	09-131	09-132	09-132	09-132	09-132	09-131	09-130	09-131	09-132	09-130	09-130	09-131
RE00-08-15810	00-603810	0.00–1.00	SOIL	09-132	09-131	09-132	09-132	09-132	09-132	09-131	09-130	09-131	09-132	09-130	09-130	09-131
RE00-08-15811	00-603810	1.75–2.75	QBT3	09-132	09-131	09-132	09-132	09-132	09-132	09-131	09-130	09-131	09-132	09-130	09-130	09-131
RE00-08-15812	00-603811	0.00–1.00	SED	09-200	09-199	09-200	09-200	09-200	09-200	09-199	09-198	09-199	09-200	09-198	09-198	09-199
RE00-08-15813	00-603811	1.25–2.25	QBT1G	09-200	09-199	09-200	09-200	09-200	09-200	09-199	09-198	09-199	09-200	09-198	09-198	09-199
RE00-08-15814	00-603812	0.00–1.00	SED	09-200	09-199	09-200	09-200	09-200	09-200	09-199	09-198	09-199	09-200	09-198	09-198	09-199
RE00-08-15815	00-603812	1.00–2.00	QBT1G	09-200	09-199	09-200	09-200	09-200	09-200	09-199	09-198	09-199	09-200	09-198	09-198	09-199
RE00-08-15816	00-603813	0.00–1.00	QBT1G	09-193	09-192	09-193	09-193	09-193	09-193	09-192	09-191	09-192	09-193	09-191	09-191	09-192
RE00-08-15817	00-603813	1.00–2.00	QBT1G	09-193	09-192	09-193	09-193	09-193	09-193	09-192	09-191	09-192	09-193	09-191	09-191	09-192
RE00-08-15818	00-603814	0.00–1.00	SED	09-193	09-192	09-193	09-193	09-193	09-193	09-192	09-191	09-192	09-193	09-191	09-191	09-192
RE00-08-15819	00-603814	1.00–2.00	QBT1G	09-200	09-199	09-200	09-200	09-200	09-200	09-199	09-198	09-199	09-200	09-198	09-198	09-199
RE00-08-15820	00-603815	0.00–1.00	SED	09-193	09-192	09-193	09-193	09-193	09-193	09-192	09-191	09-192	09-193	09-191	09-191	09-192
RE00-08-15821	00-603815	1.25–2.25	QBT1G	09-193	09-192	09-193	09-193	09-193	09-193	09-192	09-191	09-192	09-193	09-191	09-191	09-192

Table 6.6-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-15822	00-603816	0.00–1.00	SED	09-193	09-192	09-193	09-193	09-193	09-193	09-192	09-191	09-192	09-193	09-191	09-191	09-192
RE00-08-15823	00-603816	1.00–2.00	QBT1G	09-193	09-192	09-193	09-193	09-193	09-193	09-192	09-191	09-192	09-193	09-191	09-191	09-192
RE00-08-15824	00-603817	0.00–1.00	SED	09-193	09-192	09-193	09-193	09-193	09-193	09-192	09-191	09-192	09-193	09-191	09-191	09-192
RE00-08-15825	00-603817	1.25–2.25	QBT1G	09-193	09-192	09-193	09-193	09-193	09-193	09-192	09-191	09-192	09-193	09-191	09-191	09-192
RE00-08-15826	00-603818	0.00–1.00	SED	09-193	09-192	09-193	09-193	09-193	09-193	09-192	09-191	09-192	09-193	09-191	09-191	09-192
RE00-08-15827	00-603818	1.00–1.75	QBT1G	09-193	09-192	09-193	09-193	09-193	09-193	09-192	09-191	09-192	09-193	09-191	09-191	09-192
RE00-08-15828	00-603819	0.00–1.00	SED	09-193	09-192	09-193	09-193	09-193	09-193	09-192	09-191	09-192	09-193	09-191	09-191	09-192
RE00-08-15829	00-603819	1.00–2.00	QBT1G	09-193	09-192	09-193	09-193	09-193	09-193	09-192	09-191	09-192	09-193	09-191	09-191	09-192
RE00-08-15830	00-603820	0.00–1.25	SOIL	09-132	09-131	09-132	09-132	09-132	09-132	09-131	09-130	09-131	09-132	09-130	09-130	09-131
RE00-08-15831	00-603820	1.50–2.50	QBT3	09-132	09-131	09-132	09-132	09-132	09-132	09-131	09-130	09-131	09-132	09-130	09-130	09-131
RE00-08-15832	00-603820	4.00–5.00	QBT3	09-132	09-131	09-132	09-132	09-132	09-132	09-131	09-130	09-131	09-132	09-130	09-130	09-131
RE00-08-15833	00-603821	0.00–1.00	SED	09-200	09-199	09-200	09-200	09-200	09-200	09-199	09-198	09-199	09-200	09-198	09-198	09-199
RE00-08-15834	00-603821	1.50–2.25	SED	09-200	09-199	09-200	09-200	09-200	09-200	09-199	09-198	09-199	09-200	09-198	09-198	09-199
RE00-08-15835	00-603821	4.00–5.00	QBT3	09-200	09-199	09-200	09-200	09-200	09-200	09-199	09-198	09-199	09-200	09-198	09-198	09-199

Note: Numbers in analyte columns are request numbers.

Table 6.6-2
Inorganic Chemicals above BVs at SWMUs 01-001(d) and 01-006(h)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
SOIL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**[b]	**na**	**1.52**	**1**	**39.6**	**48.8**
QBT1G Background Value[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**2.6**	**8.89**	**3.96**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**4.59**	**40**
QBT3 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**7.14**	**3.14**	**4.66**	**0.5**	**14500**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**17**	**63.5**
SED Background Value[a]				**15400**	**0.83**	**3.98**	**127**	**1.31**	**0.4**	**10.5**	**4.73**	**11.2**	**0.82**	**13800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**19.7**	**60.2**
RE00-08-15788	00-603799	3.50–5.00	FILL	—[c]	—	—	—	—	—	—	—	17.9	—	—	22.6 (J+)	—	—	—	0.26	—	—	—	—	—
RE00-08-15789	00-603799	6.00–7.50	QBT3	—	—	—	—	—	—	7.9 (J+)	—	—	0.53 (U)	—	12 (J+)	—	0.316	—	1.8	—	—	—	—	—
RE00-08-15790	00-603800	0.00–1.00	SED	—	—	—	144	—	—	—	—	—	—	—	—	—	2.39 (J+)	—	6.8	0.0029 (J)	0.54 (U)	—	—	—
RE00-08-15791	00-603800	2.75–3.75	QBT3	—	—	—	—	—	—	9.9 (J)	—	7.8	—	—	—	—	2.2 (J+)	—	1.7	0.002 (J)	—	—	—	—
RE00-08-15792	00-603801	0.00–1.00	SED	—	—	—	166	—	—	—	4.9	—	—	—	—	—	—	—	0.25	—	0.55 (U)	—	—	—
RE00-08-15793	00-603801	2.50–3.50	QBT3	—	1.4 (J)	—	74.1	—	—	69.4	—	18.5	—	—	62.6	—	155 (J+)	—	0.95	0.0063	—	4.4	—	—
RE00-08-15794	00-603802	0.00–1.00	SED	—	—	—	167	—	—	—	5.2	—	—	—	—	—	0.244 (J+)	—	1.8	0.0033 (J)	0.54 (U)	—	—	—
RE00-08-15795	00-603802	3.75–4.75	QBT3	—	—	3.3	—	—	—	9.4 (J)	—	6.6	—	21600	28.8	765	—	6.8 (J-)	12.2	—	—	—	—	168 (J-)
RE00-08-15796	00-603803	0.00–1.00	SED	—	—	—	—	—	0.41	—	—	18.2	—	—	36.7	—	0.612 (J+)	—	0.73	—	—	—	—	—
RE00-08-15797	00-603803	1.00–2.00	QBT3	—	—	—	—	—	—	12.7	—	5.7	—	—	12.7	—	0.115 (J+)	—	—	—	0.51 (U)	—	—	—
RE00-08-15798	00-603804	0.00–1.00	SED	—	0.94 (J)	—	—	—	—	86.4	—	20.4	—	—	114	—	45.9 (J+)	—	1.2	—	0.36 (J)	3.7	—	—
RE00-08-15799	00-603804	1.00–2.00	QBT3	—	—	—	—	—	—	48.8	—	5.4	—	—	—	—	2.97 (J+)	19.7 (J-)	—	—	—	—	—	—
RE00-08-15800	00-603805	0.00–1.00	QBT3	—	—	—	—	—	—	22.2	—	30	—	—	18.9	—	4.31 (J+)	10.3 (J-)	0.67	—	0.53 (U)	1.9	—	77 (J-)
RE00-08-15801	00-603805	1.00–2.00	QBT3	—	—	—	—	—	—	43.1	—	11.6 (J)	—	—	—	—	—	19.5 (J-)	0.63	—	—	—	—	—
RE00-08-15802	00-603806	0.00–1.25	SED	—	—	—	—	—	—	—	—	—	—	—	19.8	—	—	—	0.19 (J)	—	—	—	—	—
RE00-08-15803	00-603806	1.25–2.25	QBT3	—	—	—	—	—	—	—	—	7	—	—	13.4	—	0.124	—	—	—	—	—	—	—
RE00-08-15804	00-603807	0.00–1.00	SOIL	—	—	—	—	—	0.7 (J)	—	—	42.1	—	—	44.9	—	0.865	—	1.4	—	—	8	—	59.8 (J-)
RE00-08-15805	00-603807	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	5	—	—	—	—	1.11	—	0.2	—	—	—	—	—
RE00-08-15806	00-603808	0.00–1.25	QBT3	—	—	—	—	—	—	—	—	—	—	—	14.5	—	—	—	—	—	—	—	—	—
RE00-08-15807	00-603808	1.25–2.25	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.35 (J)	—	—	—
RE00-08-15809	00-603809	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.48 (J)	—	—	—
RE00-08-15810	00-603810	0.00–1.00	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	0.199	—	—	—	—	—	—	—
RE00-08-15811	00-603810	1.75–2.75	QBT3	—	—	—	—	1.9	—	9.9	—	5.7	—	—	—	—	—	7	—	—	0.62	—	—	—
RE00-08-15812	00-603811	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.29	—	—	—	—	89
RE00-08-15813	00-603811	1.25–2.25	QBT1G	—	—	0.91 (J-)	—	—	—	4.4 (J-)	—	—	—	6670	—	—	—	2.7 (J-)	—	—	0.31 (J+)	—	—	—
RE00-08-15814	00-603812	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.9	—	—	—	—	—
RE00-08-15815	00-603812	1.00–2.00	QBT1G	—	—	0.59 (J)	—	—	—	8.9	—	—	—	5590	—	372 (J-)	—	4	0.38	—	—	—	—	61.4
RE00-08-15816	00-603813	0.00–1.00	QBT1G	—	—	1.2 (J-)	—	1.6 (J-)	—	9.3 (J-)	—	—	—	7340	18.4 (J-)	507	0.411 (J)	4.3 (J-)	0.9	0.022 (J)	0.4 (J+)	—	—	—
RE00-08-15817	00-603813	1.00–2.00	QBT1G	—	—	0.65 (J-)	—	—	—	11 (J-)	—	—	—	6320	—	453	—	5.6 (J-)	0.24	0.035 (J)	0.35 (J+)	—	—	—
RE00-08-15818	00-603814	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.65	—	—	—	—	—

Table 6.6-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
SOIL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na[b]**	**na**	**1.52**	**1**	**39.6**	**48.8**
QBT1G Background Value[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**2.6**	**8.89**	**3.96**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**4.59**	**40**
QBT3 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**7.14**	**3.14**	**4.66**	**0.5**	**14500**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**17**	**63.5**
SED Background Value[a]				**15400**	**0.83**	**3.98**	**127**	**1.31**	**0.4**	**10.5**	**4.73**	**11.2**	**0.82**	**13800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**19.7**	**60.2**
RE00-08-15819	00-603814	1.00–2.00	QBT1G	—	—	0.87 (J-)	—	—	—	15.8 (J-)	—	—	0.51 (U)	7120	—	309	—	7.7 (J-)	0.17 (J)	—	0.34 (J+)	—	—	45.4
RE00-08-15820	00-603815	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.2	—	0.32 (J+)	—	—	—
RE00-08-15821	00-603815	1.25–2.25	QBT1G	—	—	0.71 (J-)	—	—	—	6.4 (J-)	—	—	—	6250	—	316	—	3.5 (J-)	—	—	0.34 (J+)	—	—	—
RE00-08-15822	00-603816	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.17 (J)	—	0.32 (J+)	—	—	—
RE00-08-15823	00-603816	1.00–2.00	QBT1G	7210	—	1 (J-)	30.2 (J-)	1.6 (J-)	—	10.9 (J-)	—	—	—	7720	14 (J-)	261	—	5.9 (J-)	—	—	0.36 (J+)	—	—	—
RE00-08-15824	00-603817	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.23	—	—	—	—	—
RE00-08-15825	00-603817	1.25–2.25	QBT1G	—	—	0.77 (J-)	—	—	—	—	—	—	—	5020	—	194	—	—	—	—	—	—	—	—
RE00-08-15826	00-603818	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.54	—	—	—	—	—
RE00-08-15827	00-603818	1.00–1.75	QBT1G	—	—	0.64 (J-)	—	—	—	7.1 (J-)	—	—	—	5210	—	193	—	4.2 (J-)	0.16 (J)	—	—	—	—	—
RE00-08-15829	00-603819	1.00–2.00	QBT1G	—	—	0.61 (J-)	26.1 (J-)	—	—	27.1 (J-)	—	—	—	—	—	—	—	14.6 (J-)	—	—	0.52 (U)	—	4.8 (J)	—
RE00-08-15830	00-603820	0.00–1.25	SOIL	—	—	—	—	—	—	36.8	—	—	—	—	38.8	—	1.5	—	—	—	—	1.2	—	—
RE00-08-15831	00-603820	1.50–2.50	QBT3	—	—	—	—	—	—	15.7	—	6.4	—	—	12.8	—	1.07	—	—	—	—	—	—	—
RE00-08-15832	00-603820	4.00–5.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	0.132	—	—	—	—	—	—	—
RE00-08-15833	00-603821	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	20.9 (J+)	—	0.48	—	0.47	0.0051 (J)	0.53 (U)	—	—	—
RE00-08-15834	00-603821	1.50–2.25	SED	—	—	—	—	—	—	—	—	13.3 (J-)	—	—	36 (J-)	—	2.72	—	43.7	0.016	—	—	—	—
RE00-08-15835	00-603821	4.00–5.00	QBT3	—	—	—	—	—	—	16.3 (J-)	—	4.8 (J-)	—	—	—	—	0.218	10 (J-)	2.2	0.01	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.6-3
Organic Chemicals Detected at SWMUs 01-001(d) and 01-006(h)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Aroclor-1248	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Chrysene	Di-n-butylphthalate	Fluoranthene	Methylene Chloride	Pentachlorophenol	Phenanthrene	Pyrene	Toluene
RE00-08-15788	00-603799	3.50–5.00	FILL	—*	—	—	—	—	—	—	—	—	—	—	0.058 (J)	—	—	—	—	—	—
RE00-08-15790	00-603800	0.00–1.00	SED	—	—	—	0.12	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15791	00-603800	2.75–3.75	QBT3	—	—	—	0.11	0.054 (J)	0.043 (J)	0.043 (J)	—	0.044 (J)	—	0.067 (J-)	—	0.13 (J)	—	—	0.13 (J)	0.1 (J)	—
RE00-08-15793	00-603801	2.50–3.50	QBT3	—	0.66 (J)	—	0.35	—	—	0.036 (J)	—	0.044 (J)	—	0.045 (J-)	—	0.048 (J)	0.00094 (J)	—	—	0.041 (J)	—
RE00-08-15794	00-603802	0.00–1.00	SED	—	—	—	0.014 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15795	00-603802	3.75–4.75	QBT3	—	—	—	0.055	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15796	00-603803	0.00–1.00	SED	—	—	0.59 (J)	0.24	—	—	—	—	—	—	—	0.21 (J)	—	0.0012 (J+)	—	—	—	—
RE00-08-15797	00-603803	1.00–2.00	QBT3	—	—	0.086 (J)	0.035	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15798	00-603804	0.00–1.00	SED	—	—	—	0.037	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15802	00-603806	0.00–1.25	SED	—	—	—	—	—	0.036 (J)	—	0.062 (J)	—	—	0.043 (J)	0.038 (J)	—	—	0.8 (J)	—	—	—
RE00-08-15804	00-603807	0.00–1.00	SOIL	—	—	0.062	0.059	—	—	—	—	—	—	—	0.055 (J)	—	—	—	—	—	—
RE00-08-15808	00-603809	0.00–1.00	SOIL	—	—	—	—	—	—	—	—	—	0.88 (J)	—	—	—	—	—	—	—	—
RE00-08-15811	00-603810	1.75–2.75	QBT3	0.0073 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15812	00-603811	0.00–1.00	SED	—	—	0.15 (J)	0.064	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15813	00-603811	1.25–2.25	QBT1G	—	—	0.013 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15815	00-603812	1.00–2.00	QBT1G	—	—	—	—	—	—	—	—	—	0.055 (J)	—	—	—	—	—	—	—	—
RE00-08-15818	00-603814	0.00–1.00	SED	—	—	0.021 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15829	00-603819	1.00–2.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00083 (J)
RE00-08-15830	00-603820	0.00–1.25	SOIL	0.003 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15833	00-603821	0.00–1.00	SED	—	—	—	0.073	—	—	—	—	—	0.1 (J)	—	—	—	—	—	—	—	—
RE00-08-15834	00-603821	1.50–2.25	SED	—	—	—	0.35	—	—	—	—	—	0.074 (J)	—	0.081 (J)	—	—	—	—	—	—
RE00-08-15835	00-603821	4.00–5.00	QBT3	—	—	—	0.031 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.6-4
Radionuclides Detected or Detected above BVs/FVs at SWMUs 01-001(d) and 01-006(h)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-239/240	Strontium-90	Uranium-234	Uranium-238
SOIL Background Value[a]				**0.013**[b]	**1.65**[b]	**0.054**[b]	**1.31**[b]	**2.59**	**2.29**
QBT1G Background Value[a]				**na**[c]	**na**	**na**	**na**	**4**	**3.9**
QBT3 Background Value[a]				**na**	**na**	**na**	**na**	**1.98**	**1.93**
SED Background Value[a]				**0.04**	**0.9**	**0.068**	**1.04**	**2.59**	**2.29**
RE00-08-15788	00-603799	3.50–5.00	FILL	—[d]	—	0.97	—	—	—
RE00-08-15790	00-603800	0.00–1.00	SED	—	—	2.66	—	—	—
RE00-08-15791	00-603800	2.75–3.75	QBT3	—	—	0.611	—	—	—
RE00-08-15792	00-603801	0.00–1.00	SED	—	—	0.195	—	—	—
RE00-08-15793	00-603801	2.50–3.50	QBT3	1.81	2.87	490	—	2.58	2.69
RE00-08-15795	00-603802	3.75–4.75	QBT3	—	—	0.296	—	—	—
RE00-08-15796	00-603803	0.00–1.00	SED	—	—	5.45	—	2.68	2.4
RE00-08-15797	00-603803	1.00–2.00	QBT3	—	—	0.341	—	—	—
RE00-08-15798	00-603804	0.00–1.00	SED	2.53	3.02	373	—	3.28	2.95
RE00-08-15799	00-603804	1.00–2.00	QBT3	0.129	0.195	19.1	—	—	—
RE00-08-15800	00-603805	0.00–1.00	QBT3	—	—	0.328	—	—	—
RE00-08-15801	00-603805	1.00–2.00	QBT3	—	—	0.175	—	—	—
RE00-08-15802	00-603806	0.00–1.25	SED	—	—	0.302	—	—	—
RE00-08-15803	00-603806	1.25–2.25	QBT3	—	0.181	0.133	—	—	—
RE00-08-15804	00-603807	0.00–1.00	SOIL	—	0.296	2.74	—	—	—
RE00-08-15805	00-603807	1.00–2.00	QBT3	—	—	0.251	—	—	—
RE00-08-15808	00-603809	0.00–1.00	SOIL	—	—	0.561	—	—	—
RE00-08-15810	00-603810	0.00–1.00	SOIL	—	0.176	0.462	—	—	—
RE00-08-15812	00-603811	0.00–1.00	SED	—	—	0.5	—	—	—
RE00-08-15814	00-603812	0.00–1.00	SED	—	—	0.236	—	—	—
RE00-08-15816	00-603813	0.00–1.00	QBT1G	—	0.436	14.6	—	—	—
RE00-08-15817	00-603813	1.00–2.00	QBT1G	—	—	1.39	—	—	—
RE00-08-15818	00-603814	0.00–1.00	SED	—	—	0.103	—	—	—
RE00-08-15822	00-603816	0.00–1.00	SED	—	—	0.095	—	—	—
RE00-08-15827	00-603818	1.00–1.75	QBT1G	—	0.232	—	—	—	—
RE00-08-15829	00-603819	1.00–2.00	QBT1G	—	0.229	—	—	—	—
RE00-08-15830	00-603820	0.00–1.25	SOIL	—	3.95	189	0.5	—	—
RE00-08-15831	00-603820	1.50–2.50	QBT3	—	1.66	45.9	0.281	—	—

Table 6.6-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-239/240	Strontium-90	Uranium-234	Uranium-238
SOIL Background Value[a]				**0.013**[b]	**1.65**[b]	**0.054**[b]	**1.31**[b]	**2.59**	**2.29**
QBT1G Background Value[a]				**na**[c]	**na**	**na**	**na**	**4**	**3.9**
QBT3 Background Value[a]				**na**	**na**	**na**	**na**	**1.98**	**1.93**
SED Background Value[a]				**0.04**	**0.9**	**0.068**	**1.04**	**2.59**	**2.29**
RE00-08-15832	00-603820	4.00–5.00	QBT3	—	0.692	20.4	0.278	—	—
RE00-08-15833	00-603821	0.00–1.00	SED	—	—	0.495	—	—	—
RE00-08-15834	00-603821	1.50–2.25	SED	—	—	3.23	—	—	—
RE00-08-15835	00-603821	4.00–5.00	QBT3	—	—	0.202	—	—	—

Note: Results are in pCi/g.

[a] BVs/FVs are from LANL 1998, 059730.

[b] FV applies to samples collected from 0–0.5 ft only.

[c] na = Not available.

[d] — = Not detected or not detected above BV/FV.

Table 6.7-1
Samples Collected and Analyses Requested at SWMU 01-001(e)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-15858	00-603822	2.00–3.00	QBT3	09-744	09-743	09-744	09-744	09-744	09-744	09-743	09-742	09-743	09-744	09-742	09-742	09-743
RE00-08-15859	00-603822	4.00–5.00	QBT3	09-744	09-743	09-744	09-744	09-744	09-744	09-743	09-742	09-743	09-744	09-742	09-742	09-743
RE00-08-15862	00-603823	1.00–2.00	QBT3	09-744	09-743	09-744	09-744	09-744	09-744	09-743	09-742	09-743	09-744	09-742	09-742	09-743
RE00-08-15863	00-603823	3.00–4.00	QBT3	09-744	09-743	09-744	09-744	09-744	09-744	09-743	09-742	09-743	09-744	09-742	09-742	09-743

Note: Numbers in analyte columns are request numbers.

Table 6.7-2
Inorganic Chemicals above BVs at SWMU 01-001(e)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Calcium	Chromium	Cyanide (Total)	Selenium
QBT3 Background Value[a]				**0.5**	**2200**	**7.14**	**0.5**	**0.3**
RE00-08-15858	00-603822	2.00–3.00	QBT3	—[b]	—	—	0.58 (U)	—
RE00-08-15859	00-603822	4.00–5.00	QBT3	—	—	8	0.83 (U)	—
RE00-08-15862	00-603823	1.00–2.00	QBT3	0.58 (U)	—	—	—	0.31 (J)
RE00-08-15863	00-603823	3.00–4.00	QBT3	0.56 (U)	4940	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] — = Not detected or not detected above BV.

Table 6.7-3
Organic Chemicals Detected at SWMU 01-001(e)

Sample ID	Location ID	Depth (ft)	Media	Toluene
RE00-08-15862	00-603823	1.00–2.00	QBT3	0.0004 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

Table 6.8-1
Samples Collected and Analyses Requested at SWMU 01-001(f)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-16134	00-603824	1.25–2.25	QBT3	09-688	09-687	09-688	09-688	09-688	09-688	09-687	09-686	09-687	09-688	09-686	09-686	09-687
RE00-08-16135	00-603824	3.25–4.25	QBT3	09-688	09-687	09-688	09-688	09-688	09-688	09-687	09-686	09-687	09-688	09-686	09-686	09-687
RE00-08-16136	00-603825	4.75–5.75	QBT3	09-688	09-687	09-688	09-688	09-688	09-688	09-687	09-686	09-687	09-688	09-686	09-686	09-687
RE00-08-16137	00-603825	6.75–7.75	QBT3	09-688	09-687	09-688	09-688	09-688	09-688	09-687	09-686	09-687	09-688	09-686	09-686	09-687
RE00-08-16138	00-603826	0.00–1.00	SED	09-244	09-243	09-244	09-244	09-244	09-244	09-243	09-242	09-243	09-244	09-242	09-242	09-243
RE00-08-16139	00-603826	1.00–2.00	QBT3	09-244	09-243	09-244	09-244	09-244	09-244	09-243	09-242	09-243	09-244	09-242	09-242	09-243
RE00-08-16140	00-603827	0.00–1.25	QBT3	09-244	09-243	09-244	09-244	09-244	09-244	09-243	09-242	09-243	09-244	09-242	09-242	09-243
RE00-08-16141	00-603827	1.25–2.25	QBT3	09-244	09-243	09-244	09-244	09-244	09-244	09-243	09-242	09-243	09-244	09-242	09-242	09-243
RE00-08-16142	00-603828	0.00–1.00	SED	09-244	09-243	09-244	09-244	09-244	09-244	09-243	09-242	09-243	09-244	09-242	09-242	09-243
RE00-08-16143	00-603828	1.00–2.00	QBT3	09-244	09-243	09-244	09-244	09-244	09-244	09-243	09-242	09-243	09-244	09-242	09-242	09-243
RE00-08-16144	00-603829	0.00–1.25	SED	09-244	09-243	09-244	09-244	09-244	09-244	09-243	09-242	09-243	09-244	09-242	09-242	09-243
RE00-08-16145	00-603829	1.25–2.25	QBT3	09-244	09-243	09-244	09-244	09-244	09-244	09-243	09-242	09-243	09-244	09-242	09-242	09-243
RE00-08-16146	00-603830	0.00–1.25	SED	09-244	09-243	09-244	09-244	09-244	09-244	09-243	09-242	09-243	09-244	09-242	09-242	09-243
RE00-08-16147	00-603830	1.25–3.25	QBT3	09-244	09-243	09-244	09-244	09-244	09-244	09-243	09-242	09-243	09-244	09-242	09-242	09-243
RE00-08-16148	00-603831	0.00–1.25	SED	09-237	09-235	09-237	09-237	09-237	09-237	09-235	09-236	09-235	09-237	09-236	09-236	09-235
RE00-08-16149	00-603831	1.25–2.25	QBT3	09-237	09-235	09-237	09-237	09-237	09-237	09-235	09-236	09-235	09-237	09-236	09-236	09-235
RE00-08-16150	00-603832	0.00–1.25	SED	09-237	09-235	09-237	09-237	09-237	09-237	09-235	09-236	09-235	09-237	09-236	09-236	09-235
RE00-08-16151	00-603832	1.25–2.50	QBT3	09-237	09-235	09-237	09-237	09-237	09-237	09-235	09-236	09-235	09-237	09-236	09-236	09-235
RE00-08-16152	00-603833	0.00–1.00	SED	09-237	09-235	09-237	09-237	09-237	09-237	09-235	09-236	09-235	09-237	09-236	09-236	09-235
RE00-08-16153	00-603833	1.00–2.00	QBT3	09-237	09-235	09-237	09-237	09-237	09-237	09-235	09-236	09-235	09-237	09-236	09-236	09-235
RE00-08-16154	00-603834	0.00–1.00	SED	09-237	09-235	09-237	09-237	09-237	09-237	09-235	09-236	09-235	09-237	09-236	09-236	09-235
RE00-08-16155	00-603834	1.25–2.25	QBT3	09-237	09-235	09-237	09-237	09-237	09-237	09-235	09-236	09-235	09-237	09-236	09-236	09-235
RE00-08-16156	00-603835	0.00–1.00	SED	09-237	09-235	09-237	09-237	09-237	09-237	09-235	09-236	09-235	09-237	09-236	09-236	09-235
RE00-08-16157	00-603835	1.00–2.00	QBT3	09-237	09-235	09-237	09-237	09-237	09-237	09-235	09-236	09-235	09-237	09-236	09-236	09-235
RE00-08-16158	00-603836	0.00–1.00	SED	09-222	09-221	09-222	09-222	09-222	09-222	09-221	09-220	09-221	09-222	09-220	09-220	09-221
RE00-08-16159	00-603836	1.75–2.75	QBT3	09-222	09-221	09-222	09-222	09-222	09-222	09-221	09-220	09-221	09-222	09-220	09-220	09-221
RE00-08-16160	00-603837	0.00–1.00	SED	09-222	09-221	09-222	09-222	09-222	09-222	09-221	09-220	09-221	09-222	09-220	09-220	09-221
RE00-08-16161	00-603837	2.00–3.00	QBT3	09-222	09-221	09-222	09-222	09-222	09-222	09-221	09-220	09-221	09-222	09-220	09-220	09-221
RE00-08-16162	00-603838	0.00–1.00	QBT3	09-222	09-221	09-222	09-222	09-222	09-222	09-221	09-220	09-221	09-222	09-220	09-220	09-221
RE00-08-16163	00-603838	1.00–2.00	QBT3	09-222	09-221	09-222	09-222	09-222	09-222	09-221	09-220	09-221	09-222	09-220	09-220	09-221
RE00-08-16164	00-603839	0.00–1.00	SED	09-222	09-221	09-222	09-222	09-222	09-222	09-221	09-220	09-221	09-222	09-220	09-220	09-221
RE00-08-16165	00-603839	4.25–5.25	QBT3	09-222	09-221	09-222	09-222	09-222	09-222	09-221	09-220	09-221	09-222	09-220	09-220	09-221

Table 6.8-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-16166	00-603840	0.00–1.00	SED	09-222	09-221	09-222	09-222	09-222	09-222	09-221	09-220	09-221	09-222	09-220	09-220	09-221
RE00-08-16167	00-603840	1.50–2.50	QBT3	09-222	09-221	09-222	09-222	09-222	09-222	09-221	09-220	09-221	09-222	09-220	09-220	09-221
RE00-08-16168	00-603841	0.00–1.00	SED	09-210	09-209	09-210	09-210	09-210	09-210	09-209	09-208	09-209	09-210	09-208	09-208	09-209
RE00-08-16169	00-603841	1.00–1.75	QBT3	09-210	09-209	09-210	09-210	09-210	09-210	09-209	09-208	09-209	09-210	09-208	09-208	09-209
RE00-08-16170	00-603842	0.00–1.00	SED	09-210	09-209	09-210	09-210	09-210	09-210	09-209	09-208	09-209	09-210	09-208	09-208	09-209
RE00-08-16171	00-603842	2.00–2.50	QBT3	09-210	09-209	09-210	09-210	09-210	09-210	09-209	09-208	09-209	09-210	09-208	09-208	09-209
RE00-08-16172	00-603843	0.00–1.00	SED	09-210	09-209	09-210	09-210	09-210	09-210	09-209	09-208	09-209	09-210	09-208	09-208	09-209
RE00-08-16173	00-603843	1.25–1.75	QBT3	09-210	09-209	09-210	09-210	09-210	09-210	09-209	09-208	09-209	09-210	09-208	09-208	09-209
RE00-08-16174	00-603844	0.00–1.00	QBT3	09-688	09-687	09-688	09-688	09-688	09-688	09-687	09-686	09-687	09-688	09-686	09-686	09-687
RE00-08-16175	00-603844	1.50–2.50	QBT3	09-688	09-687	09-688	09-688	09-688	09-688	09-687	09-686	09-687	09-688	09-686	09-686	09-687
RE00-08-16176	00-603844	4.00–5.00	QBT3	09-688	09-687	09-688	09-688	09-688	09-688	09-687	09-686	09-687	09-688	09-686	09-686	09-687

Note: Numbers in analyte columns are request numbers.

Table 6.8-2
Inorganic Chemicals above BVs at SWMU 01-001(f)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Calcium	Chromium	Copper	Cyanide (Total)	Lead	Nickel	Nitrate	Selenium	Silver	Zinc
QBT3 Background Value[a]				**0.5**	**1.63**	**2200**	**7.14**	**4.66**	**0.5**	**11.2**	**6.58**	**na**[b]	**0.3**	**1**	**63.5**
SED Background Value[a]				**0.83**	**0.4**	**4420**	**10.5**	**11.2**	**0.82**	**19.7**	**9.38**	**na**	**0.3**	**1**	**60.2**
RE00-08-16134	00-603824	1.25–2.25	QBT3	—[c]	1.9	—	16.8	8.3 (J+)	—	—	10.2	—	—	4.4	—
RE00-08-16135	00-603824	3.25–4.25	QBT3	—	5	—	12.8	15.1 (J+)	—	—	9.5	—	0.33 (J)	11.5	—
RE00-08-16136	00-603825	4.75–5.75	QBT3	—	—	—	—	—	—	—	—	1.3	—	—	—
RE00-08-16137	00-603825	6.75–7.75	QBT3	—	—	—	—	5.9 (J+)	0.56 (UJ)	11.4	—	0.7	—	—	—
RE00-08-16138	00-603826	0.00–1.00	SED	—	—	—	—	—	—	—	—	2	0.52 (U)	—	—
RE00-08-16139	00-603826	1.00–2.00	QBT3	—	—	—	8.4	—	0.51 (U)	—	—	0.21	0.51 (U)	—	—
RE00-08-16140	00-603827	0.00–1.25	QBT3	—	—	—	11.4	—	0.51 (U)	—	—	0.16 (J)	—	—	—
RE00-08-16141	00-603827	1.25–2.25	QBT3	—	—	—	17.4	—	0.51 (U)	—	8.3	—	0.51 (U)	—	—
RE00-08-16142	00-603828	0.00–1.00	SED	—	—	—	—	—	—	20	—	0.2 (J)	—	—	—
RE00-08-16143	00-603828	1.00–2.00	QBT3	—	—	—	19.8	—	0.51 (U)	—	9.4	—	—	—	—
RE00-08-16145	00-603829	1.25–2.25	QBT3	—	—	—	7.4	—	0.52 (U)	—	—	—	0.52 (U)	—	—
RE00-08-16147	00-603830	1.25–3.25	QBT3	—	—	—	—	—	0.52 (U)	—	—	—	—	—	—
RE00-08-16148	00-603831	0.00–1.25	SED	—	0.65	—	—	—	—	20.6 (J)	—	—	0.33 (J)	—	63
RE00-08-16149	00-603831	1.25–2.25	QBT3	—	—	—	—	—	—	17.9 (J)	—	—	—	—	—
RE00-08-16150	00-603832	0.00–1.25	SED	—	—	—	—	—	—	—	—	0.54	—	—	—
RE00-08-16151	00-603832	1.25–2.50	QBT3	—	—	—	—	—	0.53 (U)	—	—	—	—	—	—
RE00-08-16153	00-603833	1.00–2.00	QBT3	—	—	—	9.4 (J)	—	—	—	—	—	—	—	—
RE00-08-16154	00-603834	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	0.54 (U)	—	—
RE00-08-16155	00-603834	1.25–2.25	QBT3	—	—	—	—	—	0.51 (U)	—	—	—	—	—	—
RE00-08-16156	00-603835	0.00–1.00	SED	—	—	15600	—	—	—	—	—	0.89	0.54 (U)	—	—
RE00-08-16158	00-603836	0.00–1.00	SED	1.1	—	—	—	—	—	24.5 (J)	—	0.24	0.59 (U)	—	75.8
RE00-08-16159	00-603836	1.75–2.75	QBT3	—	—	—	7.4	5.2	0.6 (U)	18.6 (J+)	—	—	0.32 (J)	—	—
RE00-08-16160	00-603837	0.00–1.00	SED	—	—	—	—	—	—	—	—	1.7	0.54 (U)	—	66.5
RE00-08-16161	00-603837	2.00–3.00	QBT3	—	—	—	—	—	—	18.5 (J+)	—	0.28	0.32 (J)	—	—
RE00-08-16162	00-603838	0.00–1.00	QBT3	—	—	—	22.9	—	—	70.5 (J+)	—	—	0.52 (U)	—	—
RE00-08-16163	00-603838	1.00–2.00	QBT3	0.54 (J)	—	—	17.9	—	—	13.7 (J+)	9.7	—	0.58 (U)	—	—
RE00-08-16164	00-603839	0.00–1.00	SED	1.1	—	—	—	—	—	—	—	0.36	0.52 (U)	—	102
RE00-08-16165	00-603839	4.25–5.25	QBT3	—	—	—	10.5	—	0.58 (U)	—	—	—	—	—	—
RE00-08-16166	00-603840	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	0.58 (U)	—	—
RE00-08-16167	00-603840	1.50–2.50	QBT3	—	—	—	22.4	—	—	—	11	—	0.32 (J)	—	—

Table 6.8-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Calcium	Chromium	Copper	Cyanide (Total)	Lead	Nickel	Nitrate	Selenium	Silver	Zinc
QBT3 Background Value[a]				**0.5**	**1.63**	**2200**	**7.14**	**4.66**	**0.5**	**11.2**	**6.58**	**na**[b]	**0.3**	**1**	**63.5**
SED Background Value[a]				**0.83**	**0.4**	**4420**	**10.5**	**11.2**	**0.82**	**19.7**	**9.38**	**na**	**0.3**	**1**	**60.2**
RE00-08-16168	00-603841	0.00–1.00	SED	—	—	—	—	—	—	—	—	0.94	0.55 (U)	—	60.7
RE00-08-16169	00-603841	1.00–1.75	QBT3	—	—	—	37.4	—	—	—	17.4	—	—	—	—
RE00-08-16170	00-603842	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	0.52 (U)	—	—
RE00-08-16171	00-603842	2.00–2.50	QBT3	—	—	—	20.4	—	—	—	9.7	—	—	—	—
RE00-08-16173	00-603843	1.25–1.75	QBT3	—	—	—	74.2	—	0.53 (U)	—	33.6	0.71	—	—	—
RE00-08-16174	00-603844	0.00–1.00	QBT3	—	—	—	25.2	—	—	—	13.3	0.21	—	—	—
RE00-08-16175	00-603844	1.50–2.50	QBT3	—	—	—	11.9	—	—	—	—	—	—	—	—
RE00-08-16176	00-603844	4.00–5.00	QBT3	—	—	—	—	—	—	—	—	—	0.33 (J)	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.8-3
Organic Chemicals Detected at SWMU 01-001(f)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Bromobenzene
RE00-08-16136	00-603825	4.75–5.75	QBT3	—*	—	—	0.15 (J)	—	—	—	—	—	—	—	0.052 (J)	0.00021 (J)
RE00-08-16137	00-603825	6.75–7.75	QBT3	—	—	—	0.085 (J)	—	—	—	—	—	—	—	0.094 (J)	—
RE00-08-16138	00-603826	0.00–1.00	SED	—	—	—	7.7 (J)	—	—	—	—	—	—	—	—	—
RE00-08-16139	00-603826	1.00–2.00	QBT3	—	—	—	1.2 (J)	—	—	—	—	—	—	—	—	—
RE00-08-16140	00-603827	0.00–1.25	QBT3	—	—	—	0.042 (J)	0.027 (J)	—	—	—	—	—	—	—	—
RE00-08-16142	00-603828	0.00–1.00	SED	—	—	—	15 (J)	—	0.046 (J)	0.049 (J)	0.042 (J)	—	0.053 (J)	—	0.1 (J)	—
RE00-08-16143	00-603828	1.00–2.00	QBT3	—	—	—	0.71 (J)	—	—	—	—	—	—	—	0.053 (J)	—
RE00-08-16144	00-603829	0.00–1.25	SED	—	—	—	13 (J)	—	—	—	—	—	—	—	—	—
RE00-08-16145	00-603829	1.25–2.25	QBT3	—	—	—	5.3 (J)	—	—	—	—	—	—	—	0.053 (J)	—
RE00-08-16146	00-603830	0.00–1.25	SED	—	—	—	5.4 (J)	—	—	—	—	—	—	—	—	—
RE00-08-16147	00-603830	1.25–3.25	QBT3	—	—	—	0.55 (J)	—	—	—	—	—	—	—	—	—
RE00-08-16148	00-603831	0.00–1.25	SED	—	—	—	610 (J)	—	—	—	—	—	—	—	—	—
RE00-08-16149	00-603831	1.25–2.25	QBT3	—	—	—	140 (J)	—	—	—	—	—	—	—	—	—
RE00-08-16150	00-603832	0.00–1.25	SED	—	0.0024 (J)	—	0.17 (J)	0.094	—	—	—	—	—	—	—	—
RE00-08-16152	00-603833	0.00–1.00	SED	—	—	—	0.038 (J)	0.036	—	—	—	—	—	—	—	—
RE00-08-16153	00-603833	1.00–2.00	QBT3	—	—	—	0.038 (J)	—	—	—	—	—	—	—	—	—
RE00-08-16154	00-603834	0.00–1.00	SED	—	—	—	0.089 (J)	0.066	—	—	—	—	—	—	0.1 (J)	—
RE00-08-16156	00-603835	0.00–1.00	SED	0.048 (J)	—	0.17 (J)	0.067 (J)	0.036	0.53	0.5	0.46	0.22 (J)	0.55	—	0.091 (J)	—
RE00-08-16157	00-603835	1.00–2.00	QBT3	—	0.02 (J)	—	—	—	0.1 (J)	0.1 (J)	0.083 (J)	0.044 (J)	0.11 (J)	—	—	—
RE00-08-16158	00-603836	0.00–1.00	SED	0.052 (J)	—	0.12 (J)	0.5 (J)	—	0.68	0.82	0.81	0.37 (J)	1	0.42 (J)	0.18 (J)	—
RE00-08-16159	00-603836	1.75–2.75	QBT3	—	—	—	0.82 (J)	—	0.15 (J)	0.14 (J)	0.15 (J)	0.067 (J)	0.14 (J)	—	—	—
RE00-08-16160	00-603837	0.00–1.00	SED	0.071 (J)	—	0.19 (J)	1.3 (J)	—	1.2	1.2	1.1	0.53	1.3	—	0.09 (J)	—
RE00-08-16161	00-603837	2.00–3.00	QBT3	—	—	—	27 (J)	—	0.048 (J)	0.045 (J)	0.042 (J)	—	0.045 (J)	—	—	—
RE00-08-16162	00-603838	0.00–1.00	QBT3	—	—	0.042 (J)	1.7 (J)	—	0.24 (J)	0.26 (J)	0.31 (J)	0.17 (J)	0.32 (J)	—	—	—
RE00-08-16163	00-603838	1.00–2.00	QBT3	—	—	0.059 (J)	19 (J)	—	0.44	0.43	0.37 (J)	0.2 (J)	0.47	—	—	—
RE00-08-16164	00-603839	0.00–1.00	SED	—	—	0.15 (J)	4 (J)	—	1	1.1	1.2	0.66	1.3	—	0.26 (J)	—
RE00-08-16165	00-603839	4.25–5.25	QBT3	—	—	—	7.6 (J)	—	0.15 (J)	0.16 (J)	0.15 (J)	0.083 (J)	0.18 (J)	—	0.08 (J)	—
RE00-08-16166	00-603840	0.00–1.00	SED	—	—	—	130 (J)	—	0.068 (J)	0.074 (J)	0.091 (J)	0.045 (J)	0.079 (J)	—	—	—
RE00-08-16167	00-603840	1.50–2.50	QBT3	—	—	—	23 (J)	—	—	—	—	—	—	—	0.12 (J)	—

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Bromobenzene
RE00-08-16168	00-603841	0.00–1.00	SED	—	—	0.07 (J)	37 (J)	—	0.43	0.41	0.42	0.22 (J)	0.45	—	—	—
RE00-08-16169	00-603841	1.00–1.75	QBT3	—	—	—	0.54 (J)	—	0.055 (J)	0.048 (J)	0.043 (J)	0.04 (J)	0.055 (J)	—	—	—
RE00-08-16170	00-603842	0.00–1.00	SED	—	—	0.049 (J)	200 (J)	—	0.2 (J)	0.2 (J)	0.2 (J)	0.1 (J)	0.26 (J)	—	—	—
RE00-08-16171	00-603842	2.00–2.50	QBT3	—	—	—	180 (J)	—	0.04 (J)	0.045 (J)	0.057 (J)	—	0.049 (J)	—	—	—
RE00-08-16172	00-603843	0.00–1.00	SED	0.072 (J)	—	0.23 (J)	89 (J)	—	1.4	1.5	1.4	0.68	1.7	—	0.049 (J)	—
RE00-08-16173	00-603843	1.25–1.75	QBT3	—	0.0031 (J)	0.038 (J)	59 (J)	—	0.3 (J)	0.35 (J)	0.34 (J)	0.18 (J)	0.42 (J)	—	0.055 (J)	—
RE00-08-16174	00-603844	0.00–1.00	QBT3	—	—	—	0.051	—	—	—	—	—	—	—	—	—
RE00-08-16175	00-603844	1.50–2.50	QBT3	—	—	—	—	—	—	—	—	—	—	—	0.056 (J)	—

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Di-n-butylphthalate	Dibenz(a,h)anthracene	Dichlorobenzene[1,2-]	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Phenanthrene	Pyrene	Trimethylbenzene[1,2,4-]
RE00-08-16136	00-603825	4.75–5.75	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16137	00-603825	6.75–7.75	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16138	00-603826	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16139	00-603826	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16140	00-603827	0.00–1.25	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16142	00-603828	0.00–1.00	SED	0.058 (J)	0.052 (J)	—	—	0.081 (J)	—	—	—	—	0.072 (J)	0.077 (J)	—
RE00-08-16143	00-603828	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16144	00-603829	0.00–1.25	SED	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16145	00-603829	1.25–2.25	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16146	00-603830	0.00–1.25	SED	—	—	—	—	—	—	—	—	—	—	—	0.00041 (J)
RE00-08-16147	00-603830	1.25–3.25	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16148	00-603831	0.00–1.25	SED	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16149	00-603831	1.25–2.25	QBT3	—	—	—	—	—	—	—	0.00072 (J)	—	—	—	—
RE00-08-16150	00-603832	0.00–1.25	SED	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16152	00-603833	0.00–1.00	SED	—	—	—	0.00033 (J)	—	—	—	—	—	—	—	—
RE00-08-16153	00-603833	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16154	00-603834	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16156	00-603835	0.00–1.00	SED	0.64	—	—	—	1.1	0.076 (J)	0.21 (J)	—	—	0.83	1	—
RE00-08-16157	00-603835	1.00–2.00	QBT3	0.13 (J)	—	—	—	0.21 (J)	—	0.047 (J)	—	—	0.12 (J)	0.2 (J)	—
RE00-08-16158	00-603836	0.00–1.00	SED	0.82	—	0.14 (J)	—	1.3	0.056 (J)	0.34 (J)	—	—	0.57	1.2	—
RE00-08-16159	00-603836	1.75–2.75	QBT3	0.16 (J)	—	—	—	0.22 (J)	—	0.062 (J)	—	—	0.13 (J)	0.24 (J)	—
RE00-08-16160	00-603837	0.00–1.00	SED	1.4	—	0.19 (J)	—	1.7	0.064 (J)	0.49	—	0.011	0.82	1.9	—
RE00-08-16161	00-603837	2.00–3.00	QBT3	0.048 (J)	—	—	—	0.058 (J)	—	—	—	0.014	—	0.069 (J)	—
RE00-08-16162	00-603838	0.00–1.00	QBT3	0.32 (J)	—	0.058 (J)	—	0.44	—	0.14 (J)	—	0.011	0.2 (J)	0.43	—
RE00-08-16163	00-603838	1.00–2.00	QBT3	0.45	—	0.075 (J)	—	0.61	—	0.18 (J)	—	0.013	0.23 (J)	0.66	—
RE00-08-16164	00-603839	0.00–1.00	SED	1.3	—	0.21 (J)	—	1.6	0.043 (J)	0.56	—	—	0.82	1.8	—
RE00-08-16165	00-603839	4.25–5.25	QBT3	0.21 (J)	—	—	—	0.25 (J)	—	0.083 (J)	—	—	0.12 (J)	0.27 (J)	—
RE00-08-16166	00-603840	0.00–1.00	SED	0.083 (J)	—	—	—	0.1 (J)	—	—	—	0.012	0.051 (J)	0.12 (J)	—
RE00-08-16167	00-603840	1.50–2.50	QBT3	—	—	—	—	—	—	—	—	0.013	—	—	—

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Di-n-butylphthalate	Dibenz(a,h)anthracene	Dichlorobenzene[1,2-]	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Phenanthrene	Pyrene	Trimethylbenzene[1,2,4-]
RE00-08-16168	00-603841	0.00–1.00	SED	0.54	—	0.084 (J)	—	0.7	—	0.2 (J)	—	0.016	0.35 (J)	0.77	—
RE00-08-16169	00-603841	1.00–1.75	QBT3	0.066 (J)	—	—	—	0.1 (J)	—	—	—	0.017	0.058 (J)	0.11 (J)	—
RE00-08-16170	00-603842	0.00–1.00	SED	0.26 (J)	—	—	—	0.37	—	0.09 (J)	—	0.015	0.26 (J)	0.38	—
RE00-08-16171	00-603842	2.00–2.50	QBT3	0.067 (J)	—	—	—	0.07 (J)	—	—	—	0.018	—	0.075 (J)	—
RE00-08-16172	00-603843	0.00–1.00	SED	1.7	—	0.23 (J)	—	2.1	0.084 (J)	0.62	—	0.016	1.1	2.3	—
RE00-08-16173	00-603843	1.25–1.75	QBT3	0.37	—	0.066 (J)	—	0.48	—	0.16 (J)	—	0.018	0.21 (J)	0.51	—
RE00-08-16174	00-603844	0.00–1.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16175	00-603844	1.50–2.50	QBT3	—	—	—	—	—	—	—	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.8-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 01-001(f)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236	Uranium-238
QBT3 Background Value[a]				**na**[b]	**na**	**na**	**1.98**	**0.09**	**1.93**
SED Background Value[a]				**0.9**	**0.068**	**0.093**	**2.59**	**0.2**	**2.29**
RE00-08-16136	00-603825	4.75–5.75	QBT3	—[c]	0.16	—	—	—	—
RE00-08-16137	00-603825	6.75–7.75	QBT3	—	0.173	—	—	—	—
RE00-08-16138	00-603826	0.00–1.00	SED	—	0.102	—	8.12	0.269	8.78
RE00-08-16139	00-603826	1.00–2.00	QBT3	0.138	—	—	—	—	—
RE00-08-16142	00-603828	0.00–1.00	SED	—	0.169	—	11.5	0.622	12.3
RE00-08-16144	00-603829	0.00–1.25	SED	—	—	—	12.2	0.69	12.9
RE00-08-16145	00-603829	1.25–2.25	QBT3	—	—	—	3.13	—	3.43
RE00-08-16146	00-603830	0.00–1.25	SED	—	—	—	6.28	0.376	7.31
RE00-08-16148	00-603831	0.00–1.25	SED	—	0.12	—	75.7	3.6	80.5
RE00-08-16149	00-603831	1.25–2.25	QBT3	—	—	—	18.6	0.79	19.4
RE00-08-16150	00-603832	0.00–1.25	SED	—	0.103	—	—	—	—
RE00-08-16154	00-603834	0.00–1.00	SED	—	0.222	—	7.52	0.399	7.2
RE00-08-16157	00-603835	1.00–2.00	QBT3	—	—	—	4.16	0.13	4.14
RE00-08-16159	00-603836	1.75–2.75	QBT3	—	—	—	4.61	0.2	4.59
RE00-08-16160	00-603837	0.00–1.00	SED	—	—	—	—	—	2.44
RE00-08-16161	00-603837	2.00–3.00	QBT3	—	—	—	7.36	0.376	7.72
RE00-08-16163	00-603838	1.00–2.00	QBT3	—	—	—	3	0.128	3.38
RE00-08-16164	00-603839	0.00–1.00	SED	—	—	—	—	—	2.87
RE00-08-16165	00-603839	4.25–5.25	QBT3	—	—	—	2.21	—	2.48
RE00-08-16166	00-603840	0.00–1.00	SED	—	—	—	24.5	1.31	24.5
RE00-08-16167	00-603840	1.50–2.50	QBT3	—	—	—	3.96	0.19	3.89
RE00-08-16168	00-603841	0.00–1.00	SED	—	—	—	—	0.281	—
RE00-08-16170	00-603842	0.00–1.00	SED	—	0.128	—	14.8	1.18	17.8
RE00-08-16171	00-603842	2.00–2.50	QBT3	—	—	—	9.33	0.86	11.2
RE00-08-16172	00-603843	0.00–1.00	SED	—	0.119	—	5.76 (J)	0.285	6.51
RE00-08-16173	00-603843	1.25–1.75	QBT3	—	0.124	—	6.08 (J)	0.47	6.76
RE00-08-16175	00-603844	1.50–2.50	QBT3	—	—	0.72	—	—	—

Notes: Results are in pCi/g. Data qualifiers are presented in Appendix A.

[a] BVs/FVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV/FV.

Table 6.9-1
Samples Collected and Analyses Requested at SWMU 01-001(g)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-16199	00-603845	3.25–4.25	QBT3	09-544	09-544	09-544	09-544	09-544	09-544	09-544	09-544	09-544	09-544	09-544	09-544	09-544
RE00-08-16200	00-603845	7.25–8.25	QBT3	09-544	09-544	09-544	09-544	09-544	09-544	09-544	09-544	09-544	09-544	09-544	09-544	09-544
RE00-08-16201	00-603846	0.00–1.00	SED	09-527	09-525	09-527	09-527	09-527	09-527	09-525	09-526	09-525	09-527	09-526	09-526	09-525
RE00-08-16202	00-603846	2.25–3.50	QBT3	09-527	09-525	09-527	09-527	09-527	09-527	09-525	09-526	09-525	09-527	09-526	09-526	09-525
RE00-08-16203	00-603847	0.00–1.00	SED	09-527	09-525	09-527	09-527	09-527	09-527	09-525	09-526	09-525	09-527	09-526	09-526	09-525
RE00-08-16204	00-603847	1.00–2.00	QBT3	09-527	09-525	09-527	09-527	09-527	09-527	09-525	09-526	09-525	09-527	09-526	09-526	09-525
RE00-08-16205	00-603848	0.00–1.00	SED	09-527	09-525	09-527	09-527	09-527	09-527	09-525	09-526	09-525	09-527	09-526	09-526	09-525
RE00-08-16206	00-603848	1.00–2.00	QBT3	09-527	09-525	09-527	09-527	09-527	09-527	09-525	09-526	09-525	09-527	09-526	09-526	09-525
RE00-08-16207	00-603849	0.00–1.00	SED	09-514	09-514	09-514	09-514	09-514	09-514	09-514	09-514	09-514	09-514	09-514	09-514	09-514
RE00-08-16208	00-603849	1.50–2.50	QBT3	09-514	09-514	09-514	09-514	09-514	09-514	09-514	09-514	09-514	09-514	09-514	09-514	09-514
RE00-08-16209	00-603849	4.00–5.00	QBT3	09-527	09-525	09-527	09-527	09-527	09-527	09-525	09-526	09-525	09-527	09-526	09-526	09-525

Note: Numbers in analyte columns are request numbers.

Table 6.9-2
Inorganic Chemicals above BVs at SWMU 01-001(g)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Chromium	Cyanide (Total)	Lead	Nickel	Nitrate	Perchlorate	Selenium
QBT3 Background Value[a]				**0.5**	**7.14**	**0.5**	**11.2**	**6.58**	**na[b]**	**na**	**0.3**
SED Background Value[a]				**0.83**	**10.5**	**0.82**	**19.7**	**9.38**	**na**	**na**	**0.3**
RE00-08-16199	00-603845	3.25–4.25	QBT3	—[c]	8 (J)	—	—	—	—	—	—
RE00-08-16200	00-603845	7.25–8.25	QBT3	—	27.9 (J)	—	—	13.4 (J)	—	—	—
RE00-08-16201	00-603846	0.00–1.00	SED	1.8 (J)	—	—	30.5 (J)	—	—	0.0022 (J)	—
RE00-08-16202	00-603846	2.25–3.50	QBT3	—	—	—	—	—	0.53	0.0029 (J)	0.52 (UJ)
RE00-08-16203	00-603847	0.00–1.00	SED	—	—	—	—	—	1.5	—	—
RE00-08-16204	00-603847	1.00–2.00	QBT3	—	25.3 (J-)	0.51 (U)	—	11.7 (J-)	0.12 (J)	—	—
RE00-08-16205	00-603848	0.00–1.00	SED	—	—	—	—	—	0.36	—	—
RE00-08-16206	00-603848	1.00–2.00	QBT3	—	7.7 (J-)	0.51 (U)	—	—	—	—	—
RE00-08-16207	00-603849	0.00–1.00	SED	1.4 (U)	—	—	86.8	—	1.6	—	—
RE00-08-16208	00-603849	1.50–2.50	QBT3	—	14.1 (J)	0.51 (U)	—	7.4	0.15 (J)	—	—
RE00-08-16209	00-603849	4.00–5.00	QBT3	—	17.9 (J-)	—	—	8.4 (J-)	—	0.0044 (J)	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.9-3
Organic Chemicals Detected at SWMU 01-001(g)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Aroclor-1260	Bis(2-ethylhexyl)phthalate	Di-n-butylphthalate	Methylene Chloride
RE00-08-16201	00-603846	0.00–1.00	SED	—*	0.18	—	—	—
RE00-08-16202	00-603846	2.25–3.50	QBT3	—	0.011 (J)	—	—	—
RE00-08-16203	00-603847	0.00–1.00	SED	—	0.0081 (J)	—	—	0.0024 (J)
RE00-08-16204	00-603847	1.00–2.00	QBT3	—	—	—	—	0.0042 (J)
RE00-08-16205	00-603848	0.00–1.00	SED	—	0.021 (J)	0.074 (J)	—	0.0065 (J+)
RE00-08-16206	00-603848	1.00–2.00	QBT3	—	—	—	—	0.0042 (J)
RE00-08-16207	00-603849	0.00–1.00	SED	0.012 (J)	0.09	0.081 (J)	0.059 (J)	—
RE00-08-16208	00-603849	1.50–2.50	QBT3	—	0.017 (J)	—	—	0.0018 (J)
RE00-08-16209	00-603849	4.00–5.00	QBT3	—	—	—	—	0.0035 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.9-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 01-001(g)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Plutonium-239/240	Uranium-234	Uranium-235/236
QBT3 Background Value[a]				**na[b]**	**na**	**1.98**	**0.09**
SED Background Value[a]				**0.04**	**0.068**	**2.59**	**0.2**
RE00-08-16199	00-603845	3.25–4.25	QBT3	—[c]	0.192	—	—
RE00-08-16200	00-603845	7.25–8.25	QBT3	—	0.096	—	—
RE00-08-16201	00-603846	0.00–1.00	SED	0.51	83.8	3.94 (J)	—
RE00-08-16202	00-603846	2.25–3.50	QBT3	—	4.01	—	—
RE00-08-16203	00-603847	0.00–1.00	SED	—	4.16	—	—
RE00-08-16204	00-603847	1.00–2.00	QBT3	—	0.395	—	0.196
RE00-08-16205	00-603848	0.00–1.00	SED	—	1.25	—	—
RE00-08-16206	00-603848	1.00–2.00	QBT3	—	0.535	—	0.224
RE00-08-16207	00-603849	0.00–1.00	SED	0.69	189	—	0.221 (J)
RE00-08-16208	00-603849	1.50–2.50	QBT3	—	29.3	—	0.184 (J)
RE00-08-16209	00-603849	4.00–5.00	QBT3	—	1.29	—	—

Notes: Results are in pCi/g. Data qualifiers are presented in Appendix A.
[a] BVs/FVs are from LANL 1998, 059730.
[b] na = Not available.
[c] — = Not detected or not detected above BV/FV.

Table 6.10-1
Samples Collected and Analyses Requested at SWMU 01-001(o)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-16218	00-603850	6.75–7.75	QBT3	09-626	09-626	09-626	09-626	09-626	09-626	09-626	09-626	09-626	09-626	09-626	09-626	09-626
RE00-08-16219	00-603850	8.75–10.00	QBT3	09-626	09-626	09-626	09-626	09-626	09-626	09-626	09-626	09-626	09-626	09-626	09-626	09-626
RE00-08-16220	00-603851	1.00–2.00	FILL	09-834	09-833	09-834	09-834	09-834	09-834	09-833	09-832	09-833	09-834	09-832	09-846	09-833
RE00-08-16222	00-603852	0.00–1.00	FILL	09-320	09-319	09-320	09-320	09-320	09-320	09-319	09-318	09-319	09-320	09-318	09-318	09-319
RE00-08-16223	00-603852	7.25–8.25	QBT3	09-361	09-361	09-361	09-361	09-361	09-361	09-361	09-361	09-361	09-361	09-361	09-361	09-361
RE00-08-16224	00-603853	0.00–1.00	FILL	09-320	09-319	09-320	09-320	09-320	09-320	09-319	09-318	09-319	09-320	09-318	09-318	09-319
RE00-08-16225	00-603853	3.00–4.00	QBT3	09-320	09-319	09-320	09-320	09-320	09-320	09-319	09-318	09-319	09-320	09-318	09-318	09-319
RE00-08-16226	00-603854	0.00–1.00	SOIL	09-298	09-299	09-298	09-298	09-298	09-298	09-299	09-298	09-299	09-298	09-298	09-298	09-299
RE00-08-16227	00-603854	2.00–3.00	QBT3	09-298	09-299	09-298	09-298	09-298	09-298	09-299	09-298	09-299	09-298	09-298	09-298	09-299
RE00-08-16228	00-603855	0.00–1.00	SOIL	09-298	09-299	09-298	09-298	09-298	09-298	09-299	09-298	09-299	09-298	09-298	09-298	09-299
RE00-08-16229	00-603855	1.50–2.50	QBT3	09-298	09-299	09-298	09-298	09-298	09-298	09-299	09-298	09-299	09-298	09-298	09-298	09-299
RE00-08-16230	00-603856	0.00–1.00	SOIL	09-320	09-319	09-320	09-320	09-320	09-320	09-319	09-318	09-319	09-320	09-318	09-318	09-319
RE00-08-16231	00-603856	1.00–2.00	QBT3	09-320	09-319	09-320	09-320	09-320	09-320	09-319	09-318	09-319	09-320	09-318	09-318	09-319
RE00-08-16232	00-603857	0.00–1.00	QBT3	09-320	09-319	09-320	09-320	09-320	09-320	09-319	09-318	09-319	09-320	09-318	09-318	09-319
RE00-08-16233	00-603857	1.00–2.00	QBT3	09-320	09-319	09-320	09-320	09-320	09-320	09-319	09-318	09-319	09-320	09-318	09-318	09-319
RE00-08-16234	00-603858	0.25–1.25	FILL	09-834	09-833	09-834	09-834	09-834	09-834	09-833	09-832	09-833	09-834	09-832	09-846	09-833
RE00-08-16235	00-603858	1.75–2.75	FILL	09-834	09-833	09-834	09-834	09-834	09-834	09-833	09-832	09-833	09-834	09-832	09-846	09-833
RE00-08-16236	00-603858	3.75–4.50	FILL	09-834	09-833	09-834	09-834	09-834	09-834	09-833	09-832	09-833	09-834	09-832	09-846	09-833

Note: Numbers in analyte columns are request numbers.

Table 6.10-2
Inorganic Chemicals above BVs at SWMU 01-001(o)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Calcium	Chromium	Copper	Cyanide (Total)	Lead	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Zinc
SOIL Background Value[a]				**0.83**	**0.4**	**6120**	**19.3**	**14.7**	**0.5**	**22.3**	**0.1**	**15.4**	**na**[b]	**na**	**1.52**	**1**	**48.8**
QBT3 Background Value[a]				**0.5**	**1.63**	**2200**	**7.14**	**4.66**	**0.5**	**11.2**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**63.5**
RE00-08-16218	00-603850	6.75–7.75	QBT3	—[c]	—	—	14.8	—	0.6 (U)	—	—	7.7	—	—	—	—	—
RE00-08-16219	00-603850	8.75–10.00	QBT3	—	—	—	22.2	—	0.62 (U)	—	—	11.2	—	—	—	—	—
RE00-08-16220	00-603851	1.00–2.00	FILL	—	—	—	—	—	0.58 (UJ)	—	—	—	0.21 (J)	—	—	—	—
RE00-08-16222	00-603852	0.00–1.00	FILL	—	—	—	—	—	—	40.1 (J-)	0.466	—	0.95	0.0027 (J)	—	—	49.5
RE00-08-16223	00-603852	7.25–8.25	QBT3	—	—	—	10.5	—	—	—	0.242	—	—	—	0.55 (U)	—	—
RE00-08-16224	00-603853	0.00–1.00	FILL	—	—	—	—	—	—	—	0.2	—	1.9	—	—	—	—
RE00-08-16225	00-603853	3.00–4.00	QBT3	—	—	—	8.4	—	—	—	—	—	0.45	—	—	—	—
RE00-08-16226	00-603854	0.00–1.00	SOIL	—	—	—	—	—	0.52 (U)	—	—	—	0.13 (J)	—	—	—	—
RE00-08-16227	00-603854	2.00–3.00	QBT3	—	—	—	9.5 (J+)	—	0.53 (U)	—	—	—	0.18 (J)	0.0025 (J)	—	—	—
RE00-08-16228	00-603855	0.00–1.00	SOIL	—	—	—	24.2 (J+)	—	—	—	—	—	0.098 (J)	—	—	—	—
RE00-08-16229	00-603855	1.50–2.50	QBT3	—	—	—	15.1 (J+)	—	—	—	—	6.7	0.2 (J)	—	—	—	—
RE00-08-16230	00-603856	0.00–1.00	SOIL	—	—	—	—	—	—	—	—	—	0.17 (J)	—	—	—	—
RE00-08-16231	00-603856	1.00–2.00	QBT3	—	—	—	10	—	—	—	—	—	0.16 (J)	—	—	—	—
RE00-08-16232	00-603857	0.00–1.00	QBT3	—	—	—	—	—	—	20 (J-)	—	—	—	—	0.52 (U)	—	—
RE00-08-16233	00-603857	1.00–2.00	QBT3	—	—	—	7.4	—	—	29.4 (J-)	—	—	0.19 (J)	—	—	—	—
RE00-08-16234	00-603858	0.25–1.25	FILL	—	—	—	—	—	0.58 (UJ)	—	—	—	0.18 (J)	0.0023 (J)	—	—	—
RE00-08-16235	00-603858	1.75–2.75	FILL	—	1.5	—	—	49.7	—	—	0.12	—	0.086 (J)	—	—	—	75.5
RE00-08-16236	00-603858	3.75–4.50	FILL	1.4 (U)	4	13200	27.1	236	0.56 (UJ)	62.7 (J+)	0.44	15.8	0.22	—	—	1.5	218

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.10-3
Organic Chemicals Detected at SWMU 01-001(o)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Chrysene	Di-n-butylphthalate	Fluoranthene	Methylene Chloride	Phenanthrene	Pyrene	Trimethylbenzene[1,2,4-]
RE00-08-16218	00-603850	6.75–7.75	QBT3	—*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00048 (J)
RE00-08-16219	00-603850	8.75–10.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00046 (J)
RE00-08-16220	00-603851	1.00–2.00	FILL	—	0.13	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16222	00-603852	0.00–1.00	FILL	—	3.2 (J)	—	0.045 (J)	0.048 (J)	0.056 (J)	0.049 (J)	—	—	0.058 (J)	—	0.093 (J)	—	0.042 (J)	0.077 (J)	—
RE00-08-16224	00-603853	0.00–1.00	FILL	—	—	0.036	—	—	—	—	—	—	—	4.8	—	—	—	—	—
RE00-08-16226	00-603854	0.00–1.00	SOIL	—	—	0.26 (J+)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16227	00-603854	2.00–3.00	QBT3	—	—	0.0085 (J+)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16228	00-603855	0.00–1.00	SOIL	—	—	0.2 (J+)	—	—	—	—	0.35 (J)	0.095 (J)	—	—	—	—	—	—	—
RE00-08-16229	00-603855	1.50–2.50	QBT3	—	—	0.0062 (J+)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16230	00-603856	0.00–1.00	SOIL	0.0049 (J+)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16232	00-603857	0.00–1.00	QBT3	0.0023 (J)	—	0.13	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16233	00-603857	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.00073 (J)	—	—	—
RE00-08-16234	00-603858	0.25–1.25	FILL	—	—	—	—	—	—	—	—	0.087 (J)	—	—	—	—	—	—	—
RE00-08-16235	00-603858	1.75–2.75	FILL	—	0.092	—	—	—	—	—	—	—	—	0.73	—	—	—	—	—
RE00-08-16236	00-603858	3.75–4.50	FILL	—	0.052	—	—	—	—	—	—	0.12 (J)	—	1.1	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.10-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 01-001(o)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-239/240	Strontium-90	Tritium
SOIL Background Value[a]				**0.013**[b]	**1.65**[b]	**0.054**[b]	**1.31**[b]	**na**[c]
QBT3 Background Value[a]				**na**	**na**	**na**	**na**	**na**
RE00-08-16218	00-603850	6.75–7.75	QBT3	—[d]	—	—	—	1.33
RE00-08-16222	00-603852	0.00–1.00	FILL	—	—	0.37	0.56	—
RE00-08-16223	00-603852	7.25–8.25	QBT3	—	—	0.229	—	—
RE00-08-16224	00-603853	0.00–1.00	FILL	—	0.187	0.588	—	—
RE00-08-16226	00-603854	0.00–1.00	SOIL	—	0.16	6.51	—	—
RE00-08-16227	00-603854	2.00–3.00	QBT3	0.119	—	0.76	—	—
RE00-08-16228	00-603855	0.00–1.00	SOIL	0.155	0.304	6.14	—	—
RE00-08-16229	00-603855	1.50–2.50	QBT3	—	—	0.234	—	—
RE00-08-16232	00-603857	0.00–1.00	QBT3	—	0.298	1.13	0.41	—
RE00-08-16233	00-603857	1.00–2.00	QBT3	—	—	—	0.34	—
RE00-08-16234	00-603858	0.25–1.25	FILL	—	—	0.103	—	—
RE00-08-16236	00-603858	3.75–4.50	FILL	—	—	3.41	—	—

Note: Results are in pCi/g.
[a] BVs/FVs are from LANL 1998, 059730.
[b] FV applies to soil and tuff samples collected from 0–0.5 ft only.
[c] na = Not available.
[d] — = Not detected or not detected above FV.

Table 6.11-1
Samples Collected and Analyses Requested at SWMU 01-001(s)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-16245	03-603859	4.75–5.75	QBT3	09-713	09-712	09-713	09-713	09-713	09-713	09-712	09-711	09-712	09-713	09-711	09-711	09-712
RE00-08-16246	03-603859	6.75–7.75	QBT3	09-713	09-712	09-713	09-713	09-713	09-713	09-712	09-711	09-712	09-713	09-711	09-711	09-712
RE00-08-16247	03-603860	8.50–9.50	QBT3	09-713	09-712	09-713	09-713	09-713	09-713	09-712	09-711	09-712	09-713	09-711	09-711	09-712
RE00-08-16248	03-603860	10.50–11.50	QBT3	09-713	09-712	09-713	09-713	09-713	09-713	09-712	09-711	09-712	09-713	09-711	09-711	09-712
RE00-08-16249	03-603861	3.00–4.00	QBT3	09-722	09-722	09-722	09-722	09-722	09-722	09-722	09-722	09-722	09-722	09-722	09-722	09-722
RE00-08-16250	03-603861	5.00–6.00	QBT3	09-722	09-722	09-722	09-722	09-722	09-722	09-722	09-722	09-722	09-722	09-722	09-722	09-722
RE00-08-16251	03-603862	3.25–4.25	QBT3	09-565	09-565	09-565	09-565	09-565	09-565	09-565	09-565	09-565	09-565	09-565	09-565	09-565
RE00-08-16252	03-603862	5.25–6.25	QBT3	09-565	09-565	09-565	09-565	09-565	09-565	09-565	09-565	09-565	09-565	09-565	09-565	09-565
RE00-08-16253	03-603863	1.50–2.50	QBT3	09-747	09-746	09-747	09-747	09-747	09-747	09-746	09-745	09-746	09-747	09-745	09-745	09-746
RE00-08-16254	03-603863	3.50–4.50	QBT3	09-747	09-746	09-747	09-747	09-747	09-747	09-746	09-745	09-746	09-747	09-745	09-745	09-746
RE00-08-16255	03-603864	2.00–3.00	QBT3	09-747	09-746	09-747	09-747	09-747	09-747	09-746	09-745	09-746	09-747	09-745	09-745	09-746
RE00-08-16256	03-603864	4.00–5.00	QBT3	09-747	09-746	09-747	09-747	09-747	09-747	09-746	09-745	09-746	09-747	09-745	09-745	09-746
RE00-08-16257	03-603865	2.00–3.00	QBT3	09-747	09-746	09-747	09-747	09-747	09-747	09-746	09-745	09-746	09-747	09-745	09-745	09-746
RE00-08-16258	03-603865	4.00–5.00	QBT3	09-747	09-746	09-747	09-747	09-747	09-747	09-746	09-745	09-746	09-747	09-745	09-745	09-746
RE00-08-16259	03-603866	1.00–2.00	QBT3	09-747	09-746	09-747	09-747	09-747	09-747	09-746	09-745	09-746	09-747	09-745	09-745	09-746
RE00-08-16260	03-603866	3.00–4.00	QBT3	09-747	09-746	09-747	09-747	09-747	09-747	09-746	09-745	09-746	09-747	09-745	09-745	09-746
RE00-08-16261	03-603867	5.75–6.75	QBT3	09-603	09-603	09-603	09-603	09-603	09-603	09-603	09-603	09-603	09-603	09-603	09-603	09-603
RE00-08-16262	03-603867	7.75–8.75	QBT3	09-603	09-603	09-603	09-603	09-603	09-603	09-603	09-603	09-603	09-603	09-603	09-603	09-603
RE00-08-16263	03-603868	8.00–9.00	QBT3	09-644	09-643	09-644	09-644	09-644	09-644	09-643	09-642	09-643	09-644	09-642	09-642	09-643
RE00-08-16264	03-603868	10.00–11.00	QBT3	09-644	09-643	09-644	09-644	09-644	09-644	09-643	09-642	09-643	09-644	09-642	09-642	09-643
RE00-08-16265	03-603869	5.25–6.25	QBT3	09-992	09-992	09-992	09-992	09-992	09-992	09-992	09-992	09-992	09-992	09-992	09-992	09-992
RE00-08-16266	03-603869	7.25–8.25	QBT3	09-992	09-992	09-992	09-992	09-992	09-992	09-992	09-992	09-992	09-992	09-992	09-992	09-992
RE00-08-16267	03-603870	3.00–4.00	QBT3	09-644	09-643	09-644	09-644	09-644	09-644	09-643	09-642	09-643	09-644	09-642	09-642	09-643
RE00-08-16268	03-603870	5.00–6.00	QBT3	09-644	09-643	09-644	09-644	09-644	09-644	09-643	09-642	09-643	09-644	09-642	09-642	09-643
RE00-08-16269	03-603871	1.50–2.50	QBT3	09-465	09-465	09-465	09-465	09-465	09-465	09-465	09-465	09-465	09-465	09-465	09-465	09-465
RE00-08-16270	03-603871	3.50–4.50	QBT3	09-465	09-465	09-465	09-465	09-465	09-465	09-465	09-465	09-465	09-465	09-465	09-465	09-465

Note: Numbers in analyte columns are request numbers.

Table 6.11-2
Inorganic Chemicals above BVs at SWMU 01-001(s)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Magnesium	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver
QBT3 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**11.2**	**1690**	**0.1**	**6.58**	**na[b]**	**na**	**0.3**	**1**
RE00-08-16245	03-603859	4.75–5.75	QBT3	—[c]	—	—	160 (J)	—	—	—	3.3 (J)	35.1 (J)	0.6 (U)	—	—	—	12.3 (J)	0.18 (J)	—	—	—
RE00-08-16246	03-603859	6.75–7.75	QBT3	—	—	—	162 (J)	—	2720 (J)	—	—	27.6 (J)	—	—	2060 (J)	—	12 (J)	—	—	—	—
RE00-08-16247	03-603860	8.50–9.50	QBT3	9510 (J)	—	—	138 (J)	—	—	—	—	5.5	—	11.7	—	—	—	—	—	0.67 (UJ)	—
RE00-08-16248	03-603860	10.50–11.50	QBT3	—	—	3	136 (J)	—	—	—	4.7 (J)	7.2 (J)	—	39.6	—	—	—	—	—	—	—
RE00-08-16249	03-603861	3.00–4.00	QBT3	—	—	—	—	—	—	—	—	—	—	13.7	—	—	—	0.44	—	—	—
RE00-08-16250	03-603861	5.00–6.00	QBT3	—	—	—	—	2.3	—	—	—	5.8	—	—	—	—	—	0.077 (J)	—	—	5.4
RE00-08-16251	03-603862	3.25–4.25	QBT3	—	—	—	—	—	—	27.4 (J)	—	—	0.54 (UJ)	—	—	0.111	13.7 (J-)	0.38	—	—	—
RE00-08-16252	03-603862	5.25–6.25	QBT3	—	—	—	—	—	—	25.5 (J)	—	—	0.54 (UJ)	—	—	—	12.1 (J-)	0.17 (J)	—	—	—
RE00-08-16253	03-603863	1.50–2.50	QBT3	—	—	—	272	—	—	7.4	—	6	0.58 (U)	13.8	—	—	—	1.3	—	0.58 (U)	—
RE00-08-16254	03-603863	3.50–4.50	QBT3	7750 (J)	—	—	54.9	—	—	—	—	7.8 (J)	0.86 (U)	—	—	—	—	—	—	0.61 (U)	—
RE00-08-16255	03-603864	2.00–3.00	QBT3	8320 (J)	0.55 (U)	2.8	126	—	3560 (J)	8.9 (J)	—	6.3 (J)	0.78 (U)	14	—	0.141	8.5 (J)	0.98	—	0.63 (U)	—
RE00-08-16256	03-603864	4.00–5.00	QBT3	8760 (J)	—	—	112	—	—	—	4.8 (J)	5.6 (J)	0.58 (U)	11.8	—	—	9.4 (J)	0.46	—	0.61 (U)	—
RE00-08-16257	03-603865	2.00–3.00	QBT3	—	0.59 (U)	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—
RE00-08-16258	03-603865	4.00–5.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4.5	—	—	—
RE00-08-16259	03-603866	1.00–2.00	QBT3	—	0.56 (U)	—	—	—	—	—	—	—	0.59 (U)	—	—	—	—	—	—	0.33 (J)	—
RE00-08-16260	03-603866	3.00–4.00	QBT3	—	0.57 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16261	03-603867	5.75–6.75	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.11 (J)	—	0.57 (U)	—
RE00-08-16262	03-603867	7.75–8.75	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.19 (J)	—	0.34 (J)	—
RE00-08-16263	03-603868	8.00–9.00	QBT3	—	—	—	—	—	—	—	—	—	0.62 (U)	—	—	—	—	—	—	0.62 (U)	—
RE00-08-16264	03-603868	10.00–11.00	QBT3	—	—	—	53.5	—	—	—	—	5.7	0.62 (U)	11.5	—	—	—	—	0.0039 (J)	—	—
RE00-08-16265	03-603869	5.25–6.25	QBT3	9070	1.24 (U)	—	50.8	—	—	—	—	—	—	—	—	—	—	2.19	—	1.22 (U)	—
RE00-08-16266	03-603869	7.25–8.25	QBT3	—	1.14 (U)	—	73.5	—	—	—	—	—	—	—	—	—	—	2.72	—	1.16 (U)	—
RE00-08-16267	03-603870	3.00–4.00	QBT3	—	—	—	—	—	—	10.1 (J+)	—	—	0.53 (U)	16.8	—	—	7	0.11 (J)	—	0.63	—
RE00-08-16268	03-603870	5.00–6.00	QBT3	—	—	—	46.5	—	—	14.5 (J+)	—	—	0.56 (U)	15.3	—	—	9.7	—	—	0.43 (J)	—
RE00-08-16269	03-603871	1.50–2.50	QBT3	—	0.61 (U)	—	—	—	—	20.4 (J-)	—	—	0.84 (J)	15.7	—	—	10.7	0.29	—	0.61 (U)	—
RE00-08-16270	03-603871	3.50–4.50	QBT3	—	0.61 (U)	—	—	—	—	20.4 (J-)	—	—	—	—	—	—	9.3	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.11-3
Organic Chemicals Detected at SWMU 01-001(s)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate
RE00-08-16245	03-603859	4.75–5.75	QBT3	—*	0.0039 (J)	—	—	—	—	—	—	—	—	—
RE00-08-16246	03-603859	6.75–7.75	QBT3	—	0.034	—	—	—	—	—	—	—	—	0.082 (J)
RE00-08-16247	03-603860	8.50–9.50	QBT3	—	0.037	—	—	—	—	—	—	—	—	—
RE00-08-16248	03-603860	10.50–11.50	QBT3	—	0.062	—	—	—	—	—	—	—	—	—
RE00-08-16249	03-603861	3.00–4.00	QBT3	—	0.0045 (J)	—	—	—	—	—	—	—	—	—
RE00-08-16251	03-603862	3.25–4.25	QBT3	—	0.0051 (J)	—	—	—	—	—	—	—	—	—
RE00-08-16252	03-603862	5.25–6.25	QBT3	—	0.0078 (J)	—	—	—	—	—	—	—	—	—
RE00-08-16254	03-603863	3.50–4.50	QBT3	—	—	0.041 (J)	—	—	0.041 (J)	—	—	—	—	—
RE00-08-16255	03-603864	2.00–3.00	QBT3	—	—	—	0.21 (J)	—	—	—	—	—	—	—
RE00-08-16256	03-603864	4.00–5.00	QBT3	—	—	—	0.015 (J)	—	—	—	—	—	—	—
RE00-08-16257	03-603865	2.00–3.00	QBT3	—	0.006 (J)	—	—	0.0062 (J)	0.075 (J)	0.094 (J)	0.077 (J)	0.043 (J)	0.093 (J)	—
RE00-08-16258	03-603865	4.00–5.00	QBT3	0.052 (J)	—	0.076 (J)	—	0.012 (J)	0.29 (J)	0.29 (J)	0.21 (J)	0.15 (J)	0.28 (J)	—
RE00-08-16261	03-603867	5.75–6.75	QBT3	—	—	—	—	0.033 (J)	—	—	—	—	—	—
RE00-08-16262	03-603867	7.75–8.75	QBT3	—	—	—	0.015 (J)	0.03 (J)	—	—	—	—	—	—
RE00-08-16263	03-603868	8.00–9.00	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16265	03-603869	5.25–6.25	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16266	03-603869	7.25–8.25	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16267	03-603870	3.00–4.00	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16269	03-603871	1.50–2.50	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16270	03-603871	3.50–4.50	QBT3	—	—	—	—	—	—	—	—	—	—	—

Table 6.11-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Butylbenzylphthalate	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Naphthalene	Phenanthrene	Propylbenzene[1-]	Pyrene
RE00-08-16245	03-603859	4.75–5.75	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16246	03-603859	6.75–7.75	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16247	03-603860	8.50–9.50	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16248	03-603860	10.50–11.50	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16249	03-603861	3.00–4.00	QBT3	—	—	—	—	—	—	—	—	—	0.0013 (J)	—
RE00-08-16251	03-603862	3.25–4.25	QBT3	—	—	—	—	—	—	0.028	—	—	—	—
RE00-08-16252	03-603862	5.25–6.25	QBT3	—	—	—	—	—	—	0.032	—	—	—	—
RE00-08-16254	03-603863	3.50–4.50	QBT3	—	0.042 (J)	—	0.094 (J)	—	—	—	0.1 (J)	0.14 (J)	—	0.088 (J)
RE00-08-16255	03-603864	2.00–3.00	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16256	03-603864	4.00–5.00	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16257	03-603865	2.00–3.00	QBT3	—	0.11 (J)	—	0.18 (J)	—	—	—	—	0.11 (J)	—	0.16 (J)
RE00-08-16258	03-603865	4.00–5.00	QBT3	—	0.37 (J)	0.052 (J)	0.78	0.053 (J)	0.15 (J)	—	—	0.66	—	0.72
RE00-08-16261	03-603867	5.75–6.75	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16262	03-603867	7.75–8.75	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16263	03-603868	8.00–9.00	QBT3	—	—	—	—	—	—	0.0014 (J)	—	—	—	—
RE00-08-16265	03-603869	5.25–6.25	QBT3	—	—	—	—	—	—	0.00365 (J)	—	—	—	—
RE00-08-16266	03-603869	7.25–8.25	QBT3	—	—	—	—	—	—	0.0029 (J)	—	—	—	—
RE00-08-16267	03-603870	3.00–4.00	QBT3	—	—	—	0.038 (J)	—	—	—	—	—	—	0.035 (J)
RE00-08-16269	03-603871	1.50–2.50	QBT3	0.09 (J)	—	—	—	—	—	0.0033 (J)	—	—	—	—
RE00-08-16270	03-603871	3.50–4.50	QBT3	—	—	—	—	—	—	0.0016 (J)	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.11-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 01-001(s)

Sample ID	Location ID	Depth (ft)	Media	Plutonium-239/240	Tritium	Uranium-234
QBT3 Background Value[a]				**na**[b]	**na**	**1.98**
RE00-08-16248	03-603860	10.50–11.50	QBT3	—[c]	0.9	—
RE00-08-16251	03-603862	3.25–4.25	QBT3	0.564	—	—
RE00-08-16253	03-603863	1.50–2.50	QBT3	0.105	—	—
RE00-08-16256	03-603864	4.00–5.00	QBT3	—	—	1.99
RE00-08-16258	03-603865	4.00–5.00	QBT3	0.29	—	—
RE00-08-16267	03-603870	3.00–4.00	QBT3	—	0.71	—
RE00-08-16269	03-603871	1.50–2.50	QBT3	—	0.94	—

Note: Results are in mg/kg.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.12-1
Samples Collected and Analyses Requested at SWMU 01-001(t)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-16284	00-603872	9.00–10.00	QBT3	09-770	09-769	09-770	09-770	09-770	09-770	09-769	09-771	09-769	09-770	09-771	09-771	09-769
RE00-08-16285	00-603872	11.00–12.00	QBT3	09-770	09-769	09-770	09-770	09-770	09-770	09-769	09-771	09-769	09-770	09-771	09-771	09-769
RE00-08-16286	00-603873	4.50–5.50	QBT3	09-770	09-769	09-770	09-770	09-770	09-770	09-769	09-771	09-769	09-770	09-771	09-771	09-769
RE00-08-16287	00-603873	6.50–7.50	QBT3	09-770	09-769	09-770	09-770	09-770	09-770	09-769	09-771	09-769	09-770	09-771	09-771	09-769
RE00-08-16288	00-603874	5.00–6.00	QBT3	09-770	09-769	09-770	09-770	09-770	09-770	09-769	09-771	09-769	09-770	09-771	09-771	09-769
RE00-08-16289	00-603874	7.00–8.00	QBT3	09-770	09-769	09-770	09-770	09-770	09-770	09-769	09-771	09-769	09-770	09-771	09-771	09-769
RE00-08-16290	00-603875	3.00–4.00	QBT3	09-770	09-769	09-770	09-770	09-770	09-770	09-769	09-771	09-769	09-770	09-771	09-771	09-769
RE00-08-16291	00-603875	5.00–6.00	QBT3	09-770	09-769	09-770	09-770	09-770	09-770	09-769	09-771	09-769	09-770	09-771	09-771	09-769
RE00-08-16292	00-603876	4.00–5.00	QBT3	09-770	09-769	09-770	09-770	09-770	09-770	09-769	09-771	09-769	09-770	09-771	09-771	09-769
RE00-08-16293	00-603876	6.00–7.00	QBT3	09-770	09-769	09-770	09-770	09-770	09-770	09-769	09-771	09-769	09-770	09-771	09-771	09-769
RE00-08-16294	00-603877	5.50–6.50	QBT3	09-467	09-467	09-467	09-467	09-467	09-467	09-467	09-467	09-467	09-467	09-467	09-467	09-467
RE00-08-16295	00-603877	7.50–8.50	QBT3	09-467	09-467	09-467	09-467	09-467	09-467	09-467	09-467	09-467	09-467	09-467	09-467	09-467
RE00-08-16296	00-603878	12.00–13.00	QBT3	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466
RE00-08-16297	00-603878	14.00–15.00	QBT3	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466
RE00-08-16298	00-603879	1.00–2.00	QBT3	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543
RE00-08-16299	00-603879	3.00–4.00	QBT3	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543
RE00-08-16300	00-603880	2.00–3.00	QBT3	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466
RE00-08-16301	00-603880	4.00–5.00	QBT3	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466
RE00-08-16302	00-603881	1.25–2.25	QBT3	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531
RE00-08-16303	00-603881	3.25–4.25	QBT3	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531

Note: Numbers in analyte columns are request numbers.

Table 6.12-2
Inorganic Chemicals above BVs at SWMU 01-001(t)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Nickel	Nitrate	Selenium
QBT3 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**11.2**	**6.58**	**na[b]**	**0.3**
RE00-08-16284	00-603872	9.00–10.00	QBT3	—[c]	—	—	—	—	—	—	—	—	—	—	—	0.59 (U)
RE00-08-16285	00-603872	11.00–12.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.6 (U)
RE00-08-16286	00-603873	4.50–5.50	QBT3	—	—	—	—	—	—	—	—	0.59 (UJ)	50.5	—	—	—
RE00-08-16287	00-603873	6.50–7.50	QBT3	—	—	—	—	—	—	—	12.7	0.59 (UJ)	39.1	—	—	—
RE00-08-16288	00-603874	5.00–6.00	QBT3	—	—	—	69.4	—	—	—	—	0.61 (UJ)	—	—	—	0.61 (U)
RE00-08-16289	00-603874	7.00–8.00	QBT3	—	—	2.9	106	—	9	—	—	0.61 (UJ)	—	—	—	0.61 (U)
RE00-08-16290	00-603875	3.00–4.00	QBT3	—	—	—	—	—	—	—	4.7	0.61 (UJ)	—	—	—	0.61 (U)
RE00-08-16291	00-603875	5.00–6.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.6 (U)
RE00-08-16292	00-603876	4.00–5.00	QBT3	—	—	—	—	—	9.4	—	—	0.57 (UJ)	—	—	—	0.57 (U)
RE00-08-16293	00-603876	6.00–7.00	QBT3	—	—	—	—	—	20.4	—	—	—	—	11.2	—	—
RE00-08-16294	00-603877	5.50–6.50	QBT3	—	—	—	—	—	37.9 (J+)	—	—	—	14.7	17.6	—	—
RE00-08-16295	00-603877	7.50–8.50	QBT3	—	—	—	95.8	—	40.1 (J+)	—	—	0.55 (UJ)	—	19	—	—
RE00-08-16296	00-603878	12.00–13.00	QBT3	—	—	—	—	—	—	3.4	4.8	0.6 (UJ)	11.7	7 (J)	0.77	0.6 (U)
RE00-08-16297	00-603878	14.00–15.00	QBT3	—	—	—	49.4	—	—	—	5.5	0.59 (UJ)	15.6	—	0.55	0.59 (U)
RE00-08-16298	00-603879	1.00–2.00	QBT3	—	—	—	—	—	12.2 (J)	—	—	0.59 (U)	—	—	3.1	0.59 (U)
RE00-08-16299	00-603879	3.00–4.00	QBT3	—	—	—	—	—	21.3 (J)	—	—	—	—	10.3 (J)	—	0.36 (J)
RE00-08-16300	00-603880	2.00–3.00	QBT3	—	—	—	—	—	—	—	—	0.58 (UJ)	—	9.4 (J)	—	0.58 (U)
RE00-08-16301	00-603880	4.00–5.00	QBT3	—	0.57 (U)	—	—	—	—	—	—	—	—	9.1 (J)	—	0.57 (U)
RE00-08-16302	00-603881	1.25–2.25	QBT3	—	—	—	—	—	13.9 (J)	—	159 (J)	0.61 (U)	—	6.7 (J)	—	0.61 (UJ)
RE00-08-16303	00-603881	3.25–4.25	QBT3	9730 (J)	—	2.9	58.8 (J)	3000 (J)	14.2 (J)	—	—	0.62 (U)	13 (J)	8.5 (J)	—	0.32 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.12-3
Organic Chemicals Detected at SWMU 01-001(t)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Benzyl Alcohol	Butylbenzylphthalate	Methylene Chloride
RE00-08-16285	00-603872	11.00–12.00	QBT3	0.0063 (J)	—*	—	—
RE00-08-16289	00-603874	7.00–8.00	QBT3	0.0033 (J)	—	—	—
RE00-08-16293	00-603876	6.00–7.00	QBT3	—	1.8	—	—
RE00-08-16296	00-603878	12.00–13.00	QBT3	—	—	0.04 (J)	0.0023 (J)
RE00-08-16297	00-603878	14.00–15.00	QBT3	—	—	—	0.0029 (J)
RE00-08-16298	00-603879	1.00–2.00	QBT3	—	—	—	0.02 (J)
RE00-08-16299	00-603879	3.00–4.00	QBT3	0.0064 (J)	—	—	0.026 (J)
RE00-08-16300	00-603880	2.00–3.00	QBT3	—	—	—	0.0032 (J)
RE00-08-16301	00-603880	4.00–5.00	QBT3	—	—	—	0.0025 (J)
RE00-08-16302	00-603881	1.25–2.25	QBT3	—	—	—	0.013 (J)
RE00-08-16303	00-603881	3.25–4.25	QBT3	—	—	—	0.015 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.12-4
Radionuclides Detected or
Detected above BVs/FVs at SWMU 01-001(t)

Sample ID	Location ID	Depth (ft)	Media	Uranium-235/236
QBT3 Background Value*				**0.09**
RE00-08-16297	00-603878	14.00–15.00	QBT3	0.168
RE00-08-16300	00-603880	2.00–3.00	QBT3	0.16
RE00-08-16301	00-603880	4.00–5.00	QBT3	0.197

Note: Results are in pCi/g.
*BVs are from LANL 1998, 059730.

Table 6.13-1
Samples Collected and Analyses Requested at SWMU 01-001(u)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-16313	00-603882	1.50–2.50	QBT3	09-728	09-727	09-728	09-728	09-728	09-728	09-727	09-726	09-727	09-728	09-726	09-726	09-727
RE00-08-16314	00-603882	3.50–4.50	QBT3	09-728	09-727	09-728	09-728	09-728	09-728	09-727	09-726	09-727	09-728	09-726	09-726	09-727
RE00-08-16315	00-603883	1.05–2.25	QBT3	09-728	09-727	09-728	09-728	09-728	09-728	09-727	09-726	09-727	09-728	09-726	09-726	09-727
RE00-08-16316	00-603883	3.25–4.25	QBT3	09-728	09-727	09-728	09-728	09-728	09-728	09-727	09-726	09-727	09-728	09-726	09-726	09-727

Note: Numbers in analyte columns are request numbers.

Table 6.13-2
Inorganic Chemicals above BVs at SWMU 01-001(u)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Calcium	Chromium	Copper	Cyanide (Total)	Lead	Nickel	Selenium	Silver
QBT3 Background Value[a]				**0.5**	**46**	**2200**	**7.14**	**4.66**	**0.5**	**11.2**	**6.58**	**0.3**	**1**
RE00-08-16313	00-603882	1.50–2.50	QBT3	—[b]	105	2370 (J)	7.7 (J)	8.1 (J)	—	14.8	6.8 (J)	0.6 (U)	1.9 (J-)
RE00-08-16314	00-603882	3.50–4.50	QBT3	—	52.4	—	—	5.1 (J)	0.6 (U)	28.2	—	0.61 (U)	—
RE00-08-16315	00-603883	1.05–2.25	QBT3	—	—	—	—	—	—	15.4	—	—	—
RE00-08-16316	00-603883	3.25–4.25	QBT3	0.51 (U)	—	—	—	—	0.51 (U)	21.3	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] — = Not detected or not detected above BV.

Table 6.13-3
Organic Chemicals Detected at SWMU 01-001(u)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Bis(2-ethylhexyl)phthalate	Fluoranthene	Isopropyltoluene[4-]	Methylene Chloride	Pyrene	Toluene	Trichlorofluoromethane
RE00-08-16313	00-603882	1.50–2.50	QBT3	—*	—	—	—	0.0055 (J)	—	0.00095 (J)	0.0031 (J)
RE00-08-16314	00-603882	3.50–4.50	QBT3	0.0061 (J)	0.062 (J)	—	—	0.0031 (J)	—	—	0.0018 (J)
RE00-08-16315	00-603883	1.05–2.25	QBT3	0.0039 (J)	—	0.048 (J)	0.0025 (J)	—	0.048 (J)	—	0.0028 (J)
RE00-08-16316	00-603883	3.25–4.25	QBT3	—	—	—	—	—	—	—	0.0022 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.14-1
Samples Collected and Analyses Requested at SWMU 01-002

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-16321	00-603884	1.75–2.75	QBT3	09-725	09-724	09-725	09-725	09-725	09-725	09-724	09-723	09-724	09-725	09-723	09-723	09-724
RE00-08-16322	00-603884	3.75–4.75	QBT3	09-725	09-724	09-725	09-725	09-725	09-725	09-724	09-723	09-724	09-725	09-723	09-723	09-724
RE00-08-16323	00-603885	0.75–1.75	QBT3	09-564	09-563	09-564	09-564	09-564	09-564	09-563	09-562	09-563	09-564	09-562	09-562	09-563
RE00-08-16324	00-603885	2.75–3.75	QBT3	09-564	09-563	09-564	09-564	09-564	09-564	09-563	09-562	09-563	09-564	09-562	09-562	09-563
RE00-08-16325	00-603886	0.75–1.75	QBT3	09-564	09-563	09-564	09-564	09-564	09-564	09-563	09-562	09-563	09-564	09-562	09-562	09-563
RE00-08-16326	00-603886	2.75–3.75	QBT3	09-564	09-563	09-564	09-564	09-564	09-564	09-563	09-562	09-563	09-564	09-562	09-562	09-563
RE00-08-16327	00-603887	1.00–2.00	QBT3	09-750	09-749	09-750	09-750	09-750	09-750	09-749	09-748	09-749	09-750	09-748	09-748	09-749
RE00-08-16328	00-603887	3.00–4.00	QBT3	09-750	09-749	09-750	09-750	09-750	09-750	09-749	09-748	09-749	09-750	09-748	09-748	09-749
RE00-08-16329	00-603888	6.00–7.00	QBT3	09-725	09-724	09-725	09-725	09-725	09-725	09-724	09-723	09-724	09-725	09-723	09-723	09-724
RE00-08-16330	00-603888	8.00–9.00	QBT3	09-725	09-724	09-725	09-725	09-725	09-725	09-724	09-723	09-724	09-725	09-723	09-723	09-724
RE00-08-16331	00-603889	1.25–2.25	QBT3	09-725	09-724	09-725	09-725	09-725	09-725	09-724	09-723	09-724	09-725	09-723	09-723	09-724
RE00-08-16332	00-603889	3.25–4.25	QBT3	09-725	09-724	09-725	09-725	09-725	09-725	09-724	09-723	09-724	09-725	09-723	09-723	09-724
RE00-08-16333	00-603890	0.75–1.75	QBT3	09-725	09-724	09-725	09-725	09-725	09-725	09-724	09-723	09-724	09-725	09-723	09-723	09-724
RE00-08-16334	00-603890	2.75–3.75	QBT3	09-725	09-724	09-725	09-725	09-725	09-725	09-724	09-723	09-724	09-725	09-723	09-723	09-724
RE00-08-16335	00-603891	1.25–2.25	QBT3	09-725	09-724	09-725	09-725	09-725	09-725	09-724	09-723	09-724	09-725	09-723	09-723	09-724
RE00-08-16336	00-603891	3.25–4.25	QBT3	09-725	09-724	09-725	09-725	09-725	09-725	09-724	09-723	09-724	09-725	09-723	09-723	09-724
RE00-08-16337	00-603892	2.00–3.00	QBT3	09-750	09-749	09-750	09-750	09-750	09-750	09-749	09-748	09-749	09-750	09-748	09-748	09-749
RE00-08-16338	00-603892	4.00–5.00	QBT3	09-750	09-749	09-750	09-750	09-750	09-750	09-749	09-748	09-749	09-750	09-748	09-748	09-749
RE00-08-16339	00-603893	1.50–2.50	QBT3	09-602	09-602	09-602	09-602	09-602	09-602	09-602	09-602	09-602	09-602	09-602	09-602	09-602
RE00-08-16340	00-603893	3.50–4.50	QBT3	09-602	09-602	09-602	09-602	09-602	09-602	09-602	09-602	09-602	09-602	09-602	09-602	09-602
RE00-08-16341	00-603894	11.00–12.00	QBT3	09-625	09-624	09-625	09-625	09-625	09-625	09-624	09-623	09-624	09-625	09-623	09-623	09-624
RE00-08-16342	00-603894	13.00–14.00	QBT3	09-625	09-624	09-625	09-625	09-625	09-625	09-624	09-623	09-624	09-625	09-623	09-623	09-624
RE00-08-16343	00-603895	3.25–4.25	QBT3	09-625	09-624	09-625	09-625	09-625	09-625	09-624	09-623	09-624	09-625	09-623	09-623	09-624
RE00-08-16344	00-603895	5.25–6.25	QBT3	09-625	09-624	09-625	09-625	09-625	09-625	09-624	09-623	09-624	09-625	09-623	09-623	09-624
RE00-08-16345	00-603896	7.25–8.25	QBT3	09-625	09-624	09-625	09-625	09-625	09-625	09-624	09-623	09-624	09-625	09-623	09-623	09-624
RE00-08-16346	00-603896	9.25–10.25	QBT3	09-625	09-624	09-625	09-625	09-625	09-625	09-624	09-623	09-624	09-625	09-623	09-623	09-624
RE00-08-16347	00-603897	5.50–7.00	QBT3	09-625	09-624	09-625	09-625	09-625	09-625	09-624	09-623	09-624	09-625	09-623	09-623	09-624
RE00-08-16348	00-603897	7.50–8.50	QBT3	09-625	09-624	09-625	09-625	09-625	09-625	09-624	09-623	09-624	09-625	09-623	09-623	09-624
RE00-08-16349	00-603898	1.25–2.25	QBT3	09-641	09-640	09-641	09-641	09-641	09-641	09-640	09-639	09-640	09-641	09-639	09-639	09-640
RE00-08-16350	00-603898	3.25–4.50	QBT3	09-641	09-640	09-641	09-641	09-641	09-641	09-640	09-639	09-640	09-641	09-639	09-639	09-640
RE00-08-16351	00-603899	1.25–2.25	QBT3	09-464	09-464	09-464	09-464	09-464	09-464	09-464	09-464	09-464	09-464	09-464	09-464	09-464
RE00-08-16352	00-603899	3.25–4.25	QBT3	09-464	09-464	09-464	09-464	09-464	09-464	09-464	09-464	09-464	09-464	09-464	09-464	09-464
RE00-08-16353	00-603900	1.25–2.25	QBT3	09-641	09-640	09-641	09-641	09-641	09-641	09-640	09-639	09-640	09-641	09-639	09-639	09-640

Table 6.14-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-16354	00-603900	3.25–4.25	QBT3	09-641	09-640	09-641	09-641	09-641	09-641	09-640	09-639	09-640	09-641	09-639	09-639	09-640
RE00-08-16355	00-603901	17.50–19.00	QBT3	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874
RE00-08-16356	00-603901	20.00–21.00	QBT3	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874
RE00-08-16357	00-604530	1.00–2.00	QBT3	09-767	09-767	09-767	09-767	09-767	09-767	09-767	09-767	09-767	09-767	09-767	09-767	09-767
RE00-08-16358	00-604530	3.00–4.00	QBT3	09-767	09-767	09-767	09-767	09-767	09-767	09-767	09-767	09-767	09-767	09-767	09-767	09-767
RE00-08-16359	00-604531	6.00–7.00	QBT3	09-750	09-749	09-750	09-750	09-750	09-750	09-749	09-748	09-749	09-750	09-748	09-748	09-749
RE00-08-16360	00-604531	8.00–9.00	QBT3	09-750	09-749	09-750	09-750	09-750	09-750	09-749	09-748	09-749	09-750	09-748	09-748	09-749
AAB8614	01-04226	1.4200–1.9200	FILL	—*	—	—	—	—	—	18899	—	—	—	—	—	—
AAB8611	01-04227	6.25–6.75	FILL	—	—	—	—	—	—	18899	—	—	—	—	—	—

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 6.14-2
Inorganic Chemicals above BVs at SWMU 01-002

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Magnesium	Mercury	Nickel	Nitrate	Perchlorate	Selenium
SOIL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**22.3**	**4610**	**0.1**	**15.4**	**na**[b]	**na**	**1.52**
QBT3 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**11.2**	**1690**	**0.1**	**6.58**	**na**	**na**	**0.3**
RE00-08-16321	00-603884	1.75–2.75	QBT3	—[c]	—	—	—	—	—	—	—	—	—	0.52 (U)	—	—	—	—	—	—	—
RE00-08-16322	00-603884	3.75–4.75	QBT3	—	—	—	—	—	—	—	7.4 (J)	—	—	0.51 (U)	—	—	—	—	—	—	—
RE00-08-16323	00-603885	0.75–1.75	QBT3	—	—	—	—	—	—	—	59.4 (J)	—	—	—	—	—	—	27.4 (J)	—	—	—
RE00-08-16324	00-603885	2.75–3.75	QBT3	—	—	—	—	—	—	—	31.5 (J)	—	—	—	—	—	—	15.1 (J-)	—	—	—
RE00-08-16325	00-603886	0.75–1.75	QBT3	—	—	—	—	—	—	—	13.8 (J)	—	—	0.53 (UJ)	—	—	—	7 (J-)	—	—	0.33 (J)
RE00-08-16326	00-603886	2.75–3.75	QBT3	—	—	—	—	—	—	—	22.1 (J)	—	—	—	13.9 (J)	—	—	10.5 (J)	—	—	0.41 (J)
RE00-08-16327	00-603887	1.00–2.00	QBT3	10800 (J)	—	—	96.9	—	—	2620 (J)	8.7 (J)	—	5.1 (J)	—	—	2010 (J)	—	9.2 (J)	—	—	0.6 (U)
RE00-08-16328	00-603887	3.00–4.00	QBT3	—	—	—	—	—	—	—	11.8 (J)	—	—	—	—	—	—	10 (J)	—	—	—
RE00-08-16329	00-603888	6.00–7.00	QBT3	13200	—	—	106	1.3	—	3450	8.1 (J)	—	6.4	—	12.7 (J+)	2350	—	8.9	0.43	—	0.6 (U)
RE00-08-16330	00-603888	8.00–9.00	QBT3	7470	—	—	201	—	—	2360	—	—	—	0.6 (U)	—	—	—	—	0.6	—	0.6 (U)
RE00-08-16331	00-603889	1.25–2.25	QBT3	—	—	—	—	—	—	—	—	—	—	0.62 (U)	24 (J+)	—	—	—	1.1	—	—
RE00-08-16332	00-603889	3.25–4.25	QBT3	—	—	—	—	—	—	—	—	—	—	—	74.2 (J+)	—	—	—	1	—	0.43 (J)
RE00-08-16333	00-603890	0.75–1.75	QBT3	—	—	—	—	—	—	—	7.4 (J)	—	—	0.59 (U)	—	—	—	—	—	—	0.59 (U)
RE00-08-16334	00-603890	2.75–3.75	QBT3	—	—	—	—	—	—	—	19.9	—	—	—	—	—	—	9.6	—	—	—
RE00-08-16335	00-603891	1.25–2.25	QBT3	—	0.63 (U)	—	—	—	—	—	13.9	—	—	—	—	—	—	—	—	—	—
RE00-08-16336	00-603891	3.25–4.25	QBT3	—	—	3.7	—	—	—	—	16.5	—	—	—	—	—	—	8.3	—	—	0.33 (J)
RE00-08-16337	00-603892	2.00–3.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.32 (J)
RE00-08-16338	00-603892	4.00–5.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.51 (J-)	—	—	—	—	—	—	—
RE00-08-16339	00-603893	1.50–2.50	QBT3	—	0.55 (UJ)	—	—	—	—	—	12.7 (J)	—	—	0.55 (U)	—	—	—	—	7.7	—	—
RE00-08-16340	00-603893	3.50–4.50	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.6	—	—
RE00-08-16341	00-603894	11.00–12.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	22.6 (J)	—	—	—	—	—	—
RE00-08-16342	00-603894	13.00–14.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.53 (U)	—	—	—	—	0.51 (J)	—	0.43 (J)
RE00-08-16343	00-603895	3.25–4.25	QBT3	—	—	—	—	—	—	—	—	—	—	0.54 (U)	38.3 (J)	—	—	—	—	—	0.4 (J)
RE00-08-16344	00-603895	5.25–6.25	QBT3	—	0.53 (U)	—	—	—	—	—	28.8	—	—	0.53 (U)	13.4 (J)	—	—	13.1	—	—	0.36 (J)
RE00-08-16345	00-603896	7.25–8.25	QBT3	—	—	—	49.3	—	—	—	11.3	—	—	0.61 (U)	—	—	—	7	6.3	—	0.61 (U)
RE00-08-16346	00-603896	9.25–10.25	QBT3	—	—	—	—	—	—	—	25.9	3.2	—	0.58 (U)	—	—	—	12.3	4.6	—	—
RE00-08-16347	00-603897	5.50–7.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.6 (U)	11.4 (J)	—	—	—	—	—	0.41 (J)
RE00-08-16348	00-603897	7.50–8.50	QBT3	—	—	—	—	—	—	—	8.9 (J)	—	—	0.57 (U)	18.4 (J)	—	—	6.8	—	—	0.36 (J)
RE00-08-16349	00-603898	1.25–2.25	QBT3	—	—	—	—	—	—	—	10.5 (J+)	—	—	—	—	—	—	—	—	—	0.35 (J)
RE00-08-16350	00-603898	3.25–4.50	QBT3	—	—	—	—	—	—	—	15.8 (J+)	—	—	0.55 (U)	—	—	—	8.8	0.16 (J)	—	—
RE00-08-16351	00-603899	1.25–2.25	QBT3	—	—	—	—	—	—	—	—	—	—	0.83 (J)	11.9 (J-)	—	—	—	—	—	—

Table 6.14-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Magnesium	Mercury	Nickel	Nitrate	Perchlorate	Selenium
SOIL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**22.3**	**4610**	**0.1**	**15.4**	**na[b]**	**na**	**1.52**
QBT3 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**11.2**	**1690**	**0.1**	**6.58**	**na**	**na**	**0.3**
RE00-08-16352	00-603899	3.25–4.25	QBT3	—	0.61 (U)	—	—	—	—	—	13.7 (J-)	—	—	—	—	—	—	—	0.36	—	0.61 (U)
RE00-08-16353	00-603900	1.25–2.25	QBT3	—	—	—	—	—	—	—	10.3 (J+)	—	—	0.54 (U)	—	—	—	—	0.18 (J)	—	0.31 (J)
RE00-08-16354	00-603900	3.25–4.25	QBT3	—	0.54 (U)	—	—	—	—	—	25.8 (J+)	—	—	0.54 (U)	—	—	—	12.3	—	—	0.31 (J)
RE00-08-16355	00-603901	17.50–19.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.54 (U)	—	—	—	—	2.5	0.0027 (J)	—
RE00-08-16356	00-603901	20.00–21.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.53 (U)	—	—	—	—	3.8	—	—
RE00-08-16357	00-604530	1.00–2.00	QBT3	—	—	—	—	—	—	—	21.1	—	—	—	—	—	—	11	1.2	—	—
RE00-08-16358	00-604530	3.00–4.00	QBT3	—	—	—	47.3	—	—	—	—	—	—	—	—	—	—	—	3.7	—	—
RE00-08-16359	00-604531	6.00–7.00	QBT3	—	—	—	69.4	—	—	6290 (J)	13 (J)	—	5 (J)	—	16.5	—	—	8.3 (J)	29.5	—	0.56 (U)
RE00-08-16360	00-604531	8.00–9.00	QBT3	—	—	—	51.4	—	—	—	—	—	—	—	13.9	—	0.101	—	44.3	—	—
AAB8614	01-04226	1.42–1.92	FILL	—	4.3 (U)	—	—	—	0.62 (U)	49500	—	—	—	NA	—	—	0.53	—	NA[d]	NA	—
AAB8611	01-04227	6.25–6.75	FILL	—	4.2 (U)	—	—	—	0.46 (U)	—	—	—	—	NA	—	—	0.12 (U)	—	NA	NA	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

[d] NA = Not analyzed.

Table 6.14-3
Organic Chemicals Detected at SWMU 01-002

Sample ID	Location ID	Depth (ft)	Media	Acetone	Aroclor-1254	Aroclor-1260	Benzene	Bis(2-ethylhexyl)phthalate	Butylbenzene[n-]	Butylbenzene[sec-]	Butylbenzene[tert-]	Chloroform	Isopropylbenzene	Isopropyltoluene[4-]	Methylene Chloride	Styrene	Toluene	Trichlorofluoromethane	Vinyl Chloride	Xylene (Total)
RE00-08-16321	00-603884	1.75–2.75	QBT3	—*	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00055 (J)	—	—
RE00-08-16323	00-603885	0.75–1.75	QBT3	0.0053 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16324	00-603885	2.75–3.75	QBT3	0.0053 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16326	00-603886	2.75–3.75	QBT3	0.0044 (J)	—	—	—	0.12 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16327	00-603887	1.00–2.00	QBT3	—	—	0.0066 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16328	00-603887	3.00–4.00	QBT3	—	—	0.0035 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16329	00-603888	6.00–7.00	QBT3	—	0.028 (J)	—	—	—	—	—	—	—	—	—	0.0009 (J)	—	—	—	—	—
RE00-08-16331	00-603889	1.25–2.25	QBT3	—	—	—	—	—	—	—	—	—	—	—	0.0057 (J)	—	—	—	—	—
RE00-08-16332	00-603889	3.25–4.25	QBT3	0.0033 (J)	—	—	—	—	—	—	—	—	—	—	0.00084 (J)	—	—	—	—	—
RE00-08-16333	00-603890	0.75–1.75	QBT3	—	—	—	—	—	—	—	—	—	—	—	0.0058 (J)	—	—	—	—	—
RE00-08-16334	00-603890	2.75–3.75	QBT3	—	—	—	—	—	—	—	—	—	—	—	0.0018 (J)	—	—	—	—	—
RE00-08-16335	00-603891	1.25–2.25	QBT3	—	—	—	—	—	—	—	—	—	—	—	0.0058 (J)	—	—	—	—	—
RE00-08-16336	00-603891	3.25–4.25	QBT3	—	—	—	—	—	—	—	—	—	—	—	0.0027 (J)	—	—	—	—	—
RE00-08-16337	00-603892	2.00–3.00	QBT3	—	—	0.0073 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16343	00-603895	3.25–4.25	QBT3	—	—	0.038	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16344	00-603895	5.25–6.25	QBT3	—	—	0.0077 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16345	00-603896	7.25–8.25	QBT3	—	—	0.0035 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16346	00-603896	9.25–10.25	QBT3	—	—	0.01 (J)	—	0.07 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16348	00-603897	7.50–8.50	QBT3	—	—	—	0.0002 (J)	—	0.00041 (J)	0.00019 (J)	—	0.00012 (J)	—	0.00023 (J)	—	—	0.00038 (J)	—	0.0017 (J)	0.0051 (J)
RE00-08-16350	00-603898	3.25–4.50	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.00041 (J)	—	—	—	—
RE00-08-16351	00-603899	1.25–2.25	QBT3	—	—	—	—	—	—	—	—	—	—	—	0.0026 (J)	—	—	—	—	—
RE00-08-16352	00-603899	3.25–4.25	QBT3	—	—	—	—	—	—	—	—	—	—	—	0.0024 (J)	—	—	—	—	—
RE00-08-16355	00-603901	17.50–19.00	QBT3	—	—	—	—	—	—	—	—	—	0.00012 (J)	—	—	—	—	—	—	—
RE00-08-16356	00-603901	20.00–21.00	QBT3	—	—	—	0.0002 (J)	0.075 (J)	—	—	0.00015 (J)	—	—	—	—	—	—	—	—	—
RE00-08-16357	00-604530	1.00–2.00	QBT3	—	0.063	—	—	—	—	—	—	—	—	—	—	—	0.00055 (J)	—	—	—
RE00-08-16358	00-604530	3.00–4.00	QBT3	—	0.21	—	—	—	—	—	—	—	—	—	—	—	0.00038 (J)	—	—	—
RE00-08-16359	00-604531	6.00–7.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	0.001 (J)	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.14-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 01-002

Sample ID	Location ID	Depth (ft)	Media	Plutonium-238	Plutonium-239/240	Tritium	Uranium-235/236
QBT3 Background Value[a]				**na**[b]	**na**	**na**	**0.09**
RE00-08-16321	00-603884	1.75–2.75	QBT3	—[c]	—	0.66	—
RE00-08-16323	00-603885	0.75–1.75	QBT3	—	—	—	0.231
RE00-08-16329	00-603888	6.00–7.00	QBT3	—	0.233	—	—
RE00-08-16335	00-603891	1.25–2.25	QBT3	—	—	0.92	—
RE00-08-16341	00-603894	11.00–12.00	QBT3	—	29.5	—	—
RE00-08-16342	00-603894	13.00–14.00	QBT3	—	9.77	—	—
RE00-08-16343	00-603895	3.25–4.25	QBT3	—	0.459	—	—
RE00-08-16347	00-603897	5.50–7.00	QBT3	—	0.234	—	—
RE00-08-16349	00-603898	1.25–2.25	QBT3	—	—	—	0.13
RE00-08-16351	00-603899	1.25–2.25	QBT3	—	—	—	0.167
RE00-08-16352	00-603899	3.25–4.25	QBT3	0.117	0.122	—	—
RE00-08-16353	00-603900	1.25–2.25	QBT3	0.112	0.272	—	—
RE00-08-16357	00-604530	1.00–2.00	QBT3	—	0.127	—	—
RE00-08-16358	00-604530	3.00–4.00	QBT3	—	0.161	—	—
RE00-08-16359	00-604531	6.00–7.00	QBT3	—	0.131	—	—

Note: Results are in pCi/g.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.15-1
Samples Collected and Analyses Requested at SWMU 01-003(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-16375	00-603902	0.00–1.00	FILL	09-828	09-826	09-828	09-828	09-828	09-828	09-826	09-827	09-826	09-828	09-827	09-844	09-826
RE00-08-16376	00-603902	2.00–3.00	FILL	09-828	09-826	09-828	09-828	09-828	09-828	09-826	09-827	09-826	09-828	09-827	09-844	09-826
RE00-08-16377	00-603903	0.00–1.00	FILL	09-297	09-296	09-297	09-297	09-297	09-297	09-296	09-295	09-296	09-297	09-295	09-295	09-296
RE00-08-16378	00-603903	2.00–3.00	QBT3	09-297	09-296	09-297	09-297	09-297	09-297	09-296	09-295	09-296	09-297	09-295	09-295	09-296
RE00-08-16379	00-603904	0.00–1.00	SED	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16380	00-603904	5.00–5.75	QBT3	09-297	09-296	09-297	09-297	09-297	09-297	09-296	09-295	09-296	09-297	09-295	09-295	09-296
RE00-08-16381	00-603905	0.00–1.00	SED	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16382	00-603905	1.00–2.00	QBT3	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16383	00-603906	0.00–1.00	SED	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16384	00-603906	3.75–5.00	QBT3	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16385	00-603907	0.00–1.00	SED	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16386	00-603907	1.00–1.75	QBT3	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16387	00-603908	0.00–1.00	SOIL	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16388	00-603908	1.00–2.00	QBT3	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16389	00-603909	0.00–1.00	SED	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16390	00-603909	1.00–2.00	QBT3	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16391	00-603910	0.00–1.00	SED	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16392	00-603910	1.00–1.75	QBT3	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16393	00-603911	0.00–1.00	SED	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16394	00-603911	1.00–1.75	QBT3	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16395	00-603912	0.00–1.00	SED	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16396	00-603912	1.50–2.50	QBT3	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16397	00-603913	0.00–1.00	SED	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16398	00-603913	1.75–2.75	QBT1G	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16399	00-603914	0.00–1.00	SED	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16400	00-603914	1.00–2.00	QBT1G	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16401	00-603915	0.00–1.00	SED	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16402	00-603915	1.00–2.00	QBT1G	09-288	09-287	09-288	09-288	09-288	09-288	09-287	09-286	09-287	09-288	09-286	09-286	09-287
RE00-08-16403	00-603916	0.00–1.00	SED	09-256	09-255	09-256	09-256	09-256	09-256	09-255	09-254	09-255	09-256	09-254	09-254	09-255
RE00-08-16404	00-603916	1.00–2.25	QBT1G	09-256	09-255	09-256	09-256	09-256	09-256	09-255	09-254	09-255	09-256	09-254	09-254	09-255
RE00-08-16405	00-603917	0.00–1.00	SED	09-256	09-255	09-256	09-256	09-256	09-256	09-255	09-254	09-255	09-256	09-254	09-254	09-255
RE00-08-16406	00-603917	1.00–2.00	QBT1G	09-256	09-255	09-256	09-256	09-256	09-256	09-255	09-254	09-255	09-256	09-254	09-254	09-255

Table 6.15-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-16407	00-603918	0.25–1.25	FILL	09-828	09-826	09-828	09-828	09-828	09-828	09-826	09-827	09-826	09-828	09-827	09-844	09-826
RE00-08-16408	00-603918	3.50–4.25	FILL	09-828	09-826	09-828	09-828	09-828	09-828	09-826	09-827	09-826	09-828	09-827	09-844	09-826
RE00-08-16412	00-603919	0.00–1.00	FILL	09-297	09-296	09-297	09-297	09-297	09-297	09-296	09-295	09-296	09-297	09-295	09-295	09-296
RE00-08-16413	00-603919	3.25–4.25	QBT3	09-297	09-296	09-297	09-297	09-297	09-297	09-296	09-295	09-296	09-297	09-295	09-295	09-296

Note: Numbers in analyte columns are request numbers.

Table 6.15-2
Inorganic Chemicals above BVs at SWMU 01-003(a)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Copper	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
SOIL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**14.7**	**0.5**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**[b]	**na**	**1.52**	**1**	**39.6**	**48.8**
SED Background Value[a]				**15400**	**0.83**	**3.98**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**11.2**	**0.82**	**13800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**19.7**	**60.2**
QBT3 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**4.66**	**0.5**	**14500**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**17**	**63.5**
QBT1G Background Value[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**3.96**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**4.59**	**40**
RE00-08-16375	00-603902	0.00–1.00	FILL	—[c]	1.2 (U)	—	—	—	0.44	6250	—	—	—	—	39.1	—	0.42	—	9.6	—	—	—	—	68.1
RE00-08-16376	00-603902	2.00–3.00	FILL	—	—	—	—	—	—	8130	—	—	—	—	30.6	—	0.21	—	4.8	—	—	—	—	58.1
RE00-08-16377	00-603903	0.00–1.00	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—	0.31	—	0.26	0.0023 (J)	—	—	—	78.8 (J+)
RE00-08-16378	00-603903	2.00–3.00	QBT3	—	0.64 (U)	—	60.6 (J+)	—	—	3420 (J)	10.5 (J)	5.2 (J)	—	—	14.3	—	—	—	1.2	—	—	—	—	—
RE00-08-16379	00-603904	0.00–1.00	SED	—	—	—	—	—	—	4650	—	—	—	—	27.1	—	0.43 (J)	—	—	0.0084	0.53 (U)	—	—	—
RE00-08-16380	00-603904	5.00–5.75	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.18 (J)	—	—	—	—	—
RE00-08-16381	00-603905	0.00–1.00	SED	—	—	—	—	2.7 (U)	—	—	—	—	—	—	10400	—	—	—	—	—	0.54 (U)	—	—	—
RE00-08-16382	00-603905	1.00–2.00	QBT3	—	—	—	—	—	—	—	8.7	—	0.58 (UJ)	—	12.4	—	—	—	—	—	0.58 (U)	—	—	—
RE00-08-16383	00-603906	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	1 (UJ)	—	44	—	0.117 (J)	—	—	—	0.52 (U)	—	—	—
RE00-08-16384	00-603906	3.75–5.00	QBT3	—	—	2.8	62.7	—	—	—	7.3	8.3	—	—	12.3	—	0.119 (J)	—	0.33	—	0.55 (U)	1.4	—	—
RE00-08-16385	00-603907	0.00–1.00	SED	—	—	—	—	—	—	—	27.1	—	—	—	—	—	—	12.8	—	—	0.52 (U)	—	—	—
RE00-08-16386	00-603907	1.00–1.75	QBT3	—	—	—	—	—	—	—	22.6	—	—	—	—	—	—	11.6	—	—	—	—	—	—
RE00-08-16387	00-603908	0.00–1.00	SOIL	—	—	—	—	—	—	—	—	—	0.54 (UJ)	—	29.8	—	—	—	0.13 (J)	—	—	—	—	—
RE00-08-16388	00-603908	1.00–2.00	QBT3	—	—	—	—	—	—	—	17.1	—	0.54 (UJ)	—	—	—	—	9.3	0.18 (J)	—	—	—	—	—
RE00-08-16389	00-603909	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.54 (U)	—	—	—
RE00-08-16390	00-603909	1.00–2.00	QBT3	—	—	—	—	1.4 (J)	—	—	15.1 (J)	—	—	—	—	—	—	7.1	0.18 (J)	—	—	—	—	—
RE00-08-16391	00-603910	0.00–1.00	SED	—	—	—	—	—	—	—	14.9 (J-)	—	—	—	—	—	—	—	0.95	—	0.54 (U)	—	—	—
RE00-08-16392	00-603910	1.00–1.75	QBT3	—	—	—	—	—	—	—	22.3	—	0.57 (UJ)	—	—	—	—	12	0.97	—	—	—	—	—
RE00-08-16393	00-603911	0.00–1.00	SED	—	—	—	—	—	—	—	11.7	—	—	—	—	—	0.179 (J)	—	—	—	—	—	—	—
RE00-08-16394	00-603911	1.00–1.75	QBT3	—	—	—	—	—	—	—	16.9 (J)	—	0.52 (U)	—	—	—	—	8.7	—	—	0.52 (U)	—	—	—
RE00-08-16395	00-603912	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	34.5	—	0.126 (J)	—	—	—	0.52 (U)	—	—	—
RE00-08-16396	00-603912	1.50–2.50	QBT3	—	—	—	—	—	—	—	12.8 (J-)	5.3 (J)	—	—	18.9	—	0.13	—	0.15 (J)	—	—	—	—	—
RE00-08-16397	00-603913	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.7	—	0.54 (U)	—	—	91.9
RE00-08-16398	00-603913	1.75–2.75	QBT1G	—	—	0.94 (J)	28.7	—	—	15100 (J)	24.7	6.7	0.57 (UJ)	4280	19.9	278	—	12.6	3.2	—	0.57 (U)	—	—	66.5 (J)
RE00-08-16399	00-603914	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.54 (U)	—	—	—
RE00-08-16400	00-603914	1.00–2.00	QBT1G	—	—	0.95 (J)	36.1 (J+)	—	—	—	7.9 (J)	4.6 (J)	—	4660	18.5	—	—	4.2 (J)	0.13 (J)	—	0.55 (U)	—	5.4	—
RE00-08-16401	00-603915	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	21.2	—	—	—	0.16 (J)	—	0.57 (U)	—	—	62.7 (J+)
RE00-08-16402	00-603915	1.00–2.00	QBT1G	—	—	0.58 (J)	26.3	—	—	2230 (J)	12.6	—	0.56 (UJ)	—	—	265	—	7.6	—	—	—	—	—	48.4 (J)
RE00-08-16403	00-603916	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.52 (U)	—	—	—

Table 6.15-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Copper	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
SOIL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**14.7**	**0.5**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**[b]	**na**	**1.52**	**1**	**39.6**	**48.8**
SED Background Value[a]				**15400**	**0.83**	**3.98**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**11.2**	**0.82**	**13800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**19.7**	**60.2**
QBT3 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**4.66**	**0.5**	**14500**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**17**	**63.5**
QBT1G Background Value[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**3.96**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**4.59**	**40**
RE00-08-16404	00-603916	1.00–2.25	QBT1G	—	—	0.95 (U)	—	—	—	—	10.4	4.3 (J)	0.53 (U)	5130	—	208	—	6	—	—	0.53 (U)	—	5.5	45.3 (J)
RE00-08-16405	00-603917	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	34.2	—	0.193	—	0.18 (J)	—	—	—	—	—
RE00-08-16406	00-603917	1.00–2.00	QBT1G	—	—	1.2	26.7	—	—	—	16	—	0.55 (U)	5050	—	337	—	8	—	—	0.55 (U)	—	—	—
RE00-08-16407	00-603918	0.25–1.25	FILL	—	—	—	—	—	—	—	—	—	0.59 (UJ)	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16408	00-603918	3.50–4.25	FILL	—	—	—	—	—	—	—	—	—	—	—	32	—	0.415	—	8.8	—	—	—	—	66.7
RE00-08-16412	00-603919	0.00–1.00	FILL	—	—	—	—	—	—	—	26.2 (J+)	—	—	—	127	798	0.383	—	1.2	—	—	—	—	—
RE00-08-16413	00-603919	3.25–4.25	QBT3	8410 (J)	—	—	—	1.6 (J)	—	3920 (J)	32.2 (J)	—	0.53 (UJ)	—	—	672 (J)	—	—	0.1 (J)	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.15-3
Organic Chemicals Detected at SWMU 01-003(a)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate
RE00-08-16375	00-603902	0.00–1.00	FILL	0.048 (J)	—*	0.11 (J)	4.6	—	0.28 (J)	0.29 (J)	0.33 (J)	0.13 (J)	0.29 (J)	—	—
RE00-08-16376	00-603902	2.00–3.00	FILL	—	—	—	2.1	—	0.081 (J)	0.093 (J)	0.11 (J)	0.06 (J)	0.082 (J)	—	—
RE00-08-16377	00-603903	0.00–1.00	FILL	—	0.015 (J)	—	0.97 (J)	—	—	—	—	—	0.041 (J)	—	—
RE00-08-16378	00-603903	2.00–3.00	QBT3	—	—	—	0.52 (J)	—	—	0.038 (J)	0.043 (J)	—	—	—	—
RE00-08-16379	00-603904	0.00–1.00	SED	—	—	—	3.8 (J)	—	0.053 (J)	0.064 (J)	0.081 (J)	0.047 (J)	0.059 (J)	—	—
RE00-08-16380	00-603904	5.00–5.75	QBT3	—	0.023	—	0.17 (J)	—	—	—	—	—	—	—	—
RE00-08-16381	00-603905	0.00–1.00	SED	—	—	0.1 (J)	0.24 (J)	—	0.52	0.66	0.97	0.49	0.81	—	—
RE00-08-16382	00-603905	1.00–2.00	QBT3	—	—	—	0.015 (J)	—	—	—	—	0.058 (J)	—	—	—
RE00-08-16383	00-603906	0.00–1.00	SED	—	—	—	0.44 (J)	—	0.091 (J)	0.1 (J)	0.11 (J)	0.093 (J)	0.12 (J)	—	—
RE00-08-16384	00-603906	3.75–5.00	QBT3	—	0.078	—	0.6 (J)	—	—	—	—	—	—	—	—
RE00-08-16385	00-603907	0.00–1.00	SED	0.035 (J)	—	0.2 (J)	0.25 (J)	—	0.91	0.9	1.1	0.58	0.91	—	—
RE00-08-16386	00-603907	1.00–1.75	QBT3	—	—	—	0.06 (J)	—	0.18 (J)	0.23 (J)	0.28 (J)	0.15 (J)	0.25 (J)	—	—
RE00-08-16387	00-603908	0.00–1.00	SOIL	—	—	—	0.32 (J)	—	—	—	—	—	—	—	—
RE00-08-16388	00-603908	1.00–2.00	QBT3	—	—	—	0.039 (J)	—	—	—	—	—	—	—	—
RE00-08-16389	00-603909	0.00–1.00	SED	0.083 (J)	—	0.37	0.17 (J)	—	2.1	2.2	2.5	1.5	2.4	—	—
RE00-08-16390	00-603909	1.00–2.00	QBT3	—	—	—	0.017 (J)	—	0.14 (J)	0.15 (J)	0.18 (J)	0.093 (J)	0.17 (J)	—	—
RE00-08-16391	00-603910	0.00–1.00	SED	0.14 (J)	—	0.7	0.1 (J)	—	2.9	2.8	3	1.6	3	—	—
RE00-08-16392	00-603910	1.00–1.75	QBT3	—	—	0.039 (J)	0.037 (J)	—	0.31 (J)	0.37	0.51	0.23 (J)	0.4	—	—
RE00-08-16393	00-603911	0.00–1.00	SED	—	—	—	0.035 (J)	0.065	—	—	0.042 (J)	—	0.05 (J)	—	—
RE00-08-16394	00-603911	1.00–1.75	QBT3	—	—	—	—	0.037	—	—	—	—	—	—	—
RE00-08-16395	00-603912	0.00–1.00	SED	—	—	—	0.51 (J)	—	0.085 (J)	0.11 (J)	0.13 (J)	0.077 (J)	0.12 (J)	—	—
RE00-08-16396	00-603912	1.50–2.50	QBT3	—	—	—	0.28 (J)	—	—	—	—	—	—	—	—
RE00-08-16397	00-603913	0.00–1.00	SED	0.28 (J)	—	1.2	0.085 (J)	—	5.7	5.5	7	2.7	4.1	—	0.13 (J)
RE00-08-16398	00-603913	1.75–2.75	QBT1G	0.05 (J)	—	0.26 (J)	0.043 (J)	—	1.5	1.6	1.9	1.2	1.9	—	—
RE00-08-16399	00-603914	0.00–1.00	SED	0.24 (J)	—	1.3	0.11 (J)	—	6	6.8	8.9	5.5	7.2	—	—
RE00-08-16400	00-603914	1.00–2.00	QBT1G	0.046 (J)	—	0.17 (J)	0.14 (J)	0.11 (J+)	1.1	1.3	1.5	0.71	1.4	—	0.092 (J)
RE00-08-16401	00-603915	0.00–1.00	SED	0.23 (J)	—	1.2	0.18 (J)	—	7.3	—	7.4	4.9	6.4	1.6 (J)	0.38
RE00-08-16402	00-603915	1.00–2.00	QBT1G	—	—	0.13 (J)	0.035 (J)	—	0.98	1.1	1.4	0.84	1.2	—	—
RE00-08-16403	00-603916	0.00–1.00	SED	0.058 (J)	—	0.25 (J)	0.14 (J)	—	1.4	1.7	2	1	2	—	0.11 (J)

Table 6.15-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate
RE00-08-16404	00-603916	1.00–2.25	QBT1G	—	—	0.078 (J)	0.19 (J)	—	0.57	0.62	0.67	0.32 (J)	0.74	—	—
RE00-08-16405	00-603917	0.00–1.00	SED	—	—	—	0.95 (J)	—	0.17 (J)	0.21 (J)	0.27 (J)	0.11 (J)	0.22 (J)	—	—
RE00-08-16406	00-603917	1.00–2.00	QBT1G	—	—	—	0.39 (J)	—	—	—	—	—	—	—	—
RE00-08-16407	00-603918	0.25–1.25	FILL	—	—	—	0.042	—	—	—	—	—	—	—	—
RE00-08-16408	00-603918	3.50–4.25	FILL	—	—	—	0.12	—	—	—	—	—	—	—	—
RE00-08-16412	00-603919	0.00–1.00	FILL	—	0.011 (J)	0.068 (J)	3.5 (J)	—	0.13 (J)	0.15 (J)	0.21 (J)	0.1 (J)	0.18 (J)	—	—
RE00-08-16413	00-603919	3.25–4.25	QBT3	—	0.012 (J)	—	0.27 (J)	—	—	—	—	—	—	—	—

Table 6.15-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Butylbenzylphthalate	Chrysene	Di-n-butylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Naphthalene	Phenanthrene	Pyrene
RE00-08-16375	00-603902	0.00–1.00	FILL	—	0.32 (J)	—	—	—	0.77	0.052 (J)	0.11 (J)	—	—	0.5	0.55
RE00-08-16376	00-603902	2.00–3.00	FILL	—	0.094 (J)	—	—	—	0.21 (J)	—	0.048 (J)	—	—	0.12 (J)	0.16 (J)
RE00-08-16377	00-603903	0.00–1.00	FILL	—	0.041 (J)	—	—	—	0.065 (J)	—	—	—	—	—	0.062 (J)
RE00-08-16378	00-603903	2.00–3.00	QBT3	—	0.044 (J)	—	—	—	0.07 (J)	—	—	—	—	0.043 (J)	0.065 (J)
RE00-08-16379	00-603904	0.00–1.00	SED	—	0.065 (J)	—	—	—	0.12 (J)	—	0.035 (J)	—	—	0.06 (J)	0.11 (J)
RE00-08-16380	00-603904	5.00–5.75	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16381	00-603905	0.00–1.00	SED	—	0.82	—	0.15 (J)	—	1.6	—	0.4	—	—	0.72	1.2
RE00-08-16382	00-603905	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16383	00-603906	0.00–1.00	SED	0.036 (J)	0.13 (J)	—	—	—	0.2 (J)	—	0.069 (J)	—	—	0.11 (J)	0.23 (J)
RE00-08-16384	00-603906	3.75–5.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16385	00-603907	0.00–1.00	SED	—	1.1	—	0.22 (J)	—	2.2	0.063 (J)	0.53	—	—	1.3	2.2
RE00-08-16386	00-603907	1.00–1.75	QBT3	—	0.26 (J)	—	0.057 (J)	—	0.47	—	0.14 (J)	—	—	0.23 (J)	0.46
RE00-08-16387	00-603908	0.00–1.00	SOIL	—	—	—	—	—	0.047 (J)	—	—	—	—	—	0.056 (J)
RE00-08-16388	00-603908	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16389	00-603909	0.00–1.00	SED	—	2.7	—	0.53	0.05 (J)	5	0.14 (J)	1.3	—	—	2.7	4.7
RE00-08-16390	00-603909	1.00–2.00	QBT3	—	0.18 (J)	—	—	—	0.33 (J)	—	0.079 (J)	—	—	0.18 (J)	0.27 (J)
RE00-08-16391	00-603910	0.00–1.00	SED	—	3.6	—	0.55	0.074 (J)	6.4	0.23 (J)	1.5	—	—	3.8	5
RE00-08-16392	00-603910	1.00–1.75	QBT3	—	0.47	—	0.075 (J)	—	0.79	—	0.2 (J)	—	—	0.34 (J)	0.65
RE00-08-16393	00-603911	0.00–1.00	SED	—	0.049 (J)	—	—	—	0.067 (J)	—	—	—	—	—	0.072 (J)
RE00-08-16394	00-603911	1.00–1.75	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16395	00-603912	0.00–1.00	SED	—	0.14 (J)	—	—	—	0.23 (J)	—	0.065 (J)	—	—	0.095 (J)	0.21 (J)
RE00-08-16396	00-603912	1.50–2.50	QBT3	—	—	0.053 (J)	—	—	0.046 (J)	—	—	—	—	—	0.043 (J)
RE00-08-16397	00-603913	0.00–1.00	SED	—	7.8	—	0.89	0.16 (J)	14	0.4	2.6	—	—	8.3	12
RE00-08-16398	00-603913	1.75–2.75	QBT1G	—	2	—	0.37	—	3.5	0.091 (J)	0.98	0.015	—	1.7	3.6
RE00-08-16399	00-603914	0.00–1.00	SED	—	8.4	—	1.7	0.15 (J)	16	0.43	4.8	—	—	6.9	13
RE00-08-16400	00-603914	1.00–2.00	QBT1G	—	1.5	—	—	—	2.5	0.068 (J)	0.63	—	—	1.3	2.2
RE00-08-16401	00-603915	0.00–1.00	SED	—	9.7	—	1.5	0.16 (J)	17	0.35 (J)	4.2	—	0.044 (J)	8.9	16
RE00-08-16402	00-603915	1.00–2.00	QBT1G	—	1.3	—	0.26 (J)	—	2.2	—	0.67	—	—	0.88	2
RE00-08-16403	00-603916	0.00–1.00	SED	—	1.9	—	0.3 (J)	0.037 (J)	3.1	0.085 (J)	0.89	—	—	1.5	2.6
RE00-08-16404	00-603916	1.00–2.25	QBT1G	—	0.75	—	0.11 (J)	—	1.2	—	0.29 (J)	—	—	0.53	1.1
RE00-08-16405	00-603917	0.00–1.00	SED	—	0.25 (J)	—	—	—	0.43	—	0.094 (J)	—	—	0.21 (J)	0.35 (J)

Table 6.15-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Butylbenzylphthalate	Chrysene	Di-n-butylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Naphthalene	Phenanthrene	Pyrene
RE00-08-16406	00-603917	1.00–2.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16407	00-603918	0.25–1.25	FILL	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16408	00-603918	3.50–4.25	FILL	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16412	00-603919	0.00–1.00	FILL	—	0.35	—	—	—	0.24 (J)	—	0.079 (J)	—	—	0.14 (J)	0.2 (J)
RE00-08-16413	00-603919	3.25–4.25	QBT3	—	—	—	—	—	—	—	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.15-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 01-003(a)

Sample ID	Location ID	Depth (ft)	Media	Cesium-134	Cesium-137	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236	Uranium-238
SOIL Background Value[a]				**na**[b]	**1.65**[c]	**0.054**[c]	**na**	**2.59**	**0.2**	**2.29**
QBT1G Background Value[a]				**na**	**na**	**na**	**na**	**4**	**0.18**	**3.9**
QBT3 Background Value[a]				**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
SED Background Value[a]				**na**	**0.9**	**0.068**	**0.093**	**2.59**	**0.2**	**2.29**
RE00-08-16375	00-603902	0.00–1.00	FILL	—[d]	—	0.205	—	4.42	0.307	3.68
RE00-08-16376	00-603902	2.00–3.00	FILL	—	—	0.114	—	2.78	—	2.59
RE00-08-16377	00-603903	0.00–1.00	FILL	—	—	0.249	—	—	—	—
RE00-08-16378	00-603903	2.00–3.00	QBT3	—	—	0.178	—	3.36	0.122	2.67
RE00-08-16379	00-603904	0.00–1.00	SED	—	—	0.302	—	3.05	—	2.31
RE00-08-16380	00-603904	5.00–5.75	QBT3	—	—	2.17	—	4.89	0.163	2.96
RE00-08-16381	00-603905	0.00–1.00	SED	—	—	3.29	—	—	—	—
RE00-08-16382	00-603905	1.00–2.00	QBT3	—	—	1.65	—	2.14	—	2
RE00-08-16383	00-603906	0.00–1.00	SED	—	—	0.566	—	—	—	—
RE00-08-16384	00-603906	3.75–5.00	QBT3	—	—	0.852	—	2.06	—	—
RE00-08-16385	00-603907	0.00–1.00	SED	—	—	0.56	—	—	—	—
RE00-08-16386	00-603907	1.00–1.75	QBT3	—	—	0.234	—	—	—	—
RE00-08-16387	00-603908	0.00–1.00	SOIL	0.043	0.294	0.917	—	—	—	—
RE00-08-16388	00-603908	1.00–2.00	QBT3	—	—	0.418	0.4	—	—	—
RE00-08-16389	00-603909	0.00–1.00	SED	—	—	0.43	—	—	—	—
RE00-08-16391	00-603910	0.00–1.00	SED	—	—	0.467	—	—	—	—
RE00-08-16393	00-603911	0.00–1.00	SED	—	—	1.19	—	—	—	—
RE00-08-16394	00-603911	1.00–1.75	QBT3	—	—	0.564	—	—	—	—

Table 6.15-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-134	Cesium-137	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236	Uranium-238
SOIL Background Value[a]				**na**[b]	**1.65**[c]	**0.054**[c]	**na**	**2.59**	**0.2**	**2.29**
QBT1G Background Value[a]				**na**	**na**	**na**	**na**	**4**	**0.18**	**3.9**
QBT3 Background Value[a]				**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
SED Background Value[a]				**na**	**0.9**	**0.068**	**0.093**	**2.59**	**0.2**	**2.29**
RE00-08-16395	00-603912	0.00–1.00	SED	—	—	1.68	—	—	—	—
RE00-08-16396	00-603912	1.50–2.50	QBT3	—	—	2.76	—	2.06	0.163	—
RE00-08-16397	00-603913	0.00–1.00	SED	—	—	0.593	—	—	—	—
RE00-08-16398	00-603913	1.75–2.75	QBT1G	—	—	1.2	—	—	—	—
RE00-08-16399	00-603914	0.00–1.00	SED	—	—	0.662	—	—	—	—
RE00-08-16400	00-603914	1.00–2.00	QBT1G	—	—	0.468	—	—	—	—
RE00-08-16401	00-603915	0.00–1.00	SED	—	—	0.869	—	—	—	—
RE00-08-16402	00-603915	1.00–2.00	QBT1G	—	—	0.377	—	—	—	—
RE00-08-16403	00-603916	0.00–1.00	SED	—	—	0.713	—	—	—	—
RE00-08-16404	00-603916	1.00–2.25	QBT1G	—	—	0.331	—	—	—	—
RE00-08-16405	00-603917	0.00–1.00	SED	—	—	2.26	—	—	—	—
RE00-08-16406	00-603917	1.00–2.00	QBT1G	—	—	0.755	—	—	—	—
RE00-08-16407	00-603918	0.25–1.25	FILL	—	—	0.109	—	—	—	—
RE00-08-16408	00-603918	3.50–4.25	FILL	—	—	0.185	—	—	—	—
RE00-08-16412	00-603919	0.00–1.00	FILL	—	—	0.836	—	—	—	—

Notes: Results are in pCi/g.

[a] BVs/FVs are from LANL 1998, 059730.

[b] na = Not available.

[c] FV applies to soil and tuff samples collected from 0–0.5 ft only and applies to sediment samples of all depth.

[d] — = Not detected or not detected above BV/FV.

Table 6.16-1
Samples Collected and Analyses Requested at SWMU 01-003(b)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	Strontium-90	Cyanide (total)
RE00-08-16522	00-604022	0.00–1.00	SED	09-949	09-948	09-949	09-949	09-949	09-949	09-948	09-948	09-949	09-948
RE00-08-16523	00-604022	2.00–3.00	QBT3	09-949	09-948	09-949	09-949	09-949	09-949	09-948	09-948	09-949	09-948
RE00-08-16525	00-604023	0.00–1.00	FILL	09-949	09-948	09-949	09-949	09-949	09-949	09-948	09-948	09-949	09-948
RE00-08-16526	00-604023	4.25–5.25	QBT3	09-949	09-948	09-949	09-949	09-949	09-949	09-948	09-948	09-949	09-948
RE00-08-16528	00-604024	0.00–1.00	SED	09-949	09-948	09-949	09-949	09-949	09-949	09-948	09-948	09-949	09-948
RE00-08-16529	00-604024	1.25–2.25	QBT3	09-949	09-948	09-949	09-949	09-949	09-949	09-948	09-948	09-949	09-948
RE00-08-16531	00-604025	0.00–1.00	SED	09-949	09-948	09-949	09-949	09-949	09-949	09-948	09-948	09-949	09-948
RE00-08-16532	00-604025	3.00–4.00	QBT3	09-949	09-948	09-949	09-949	09-949	09-949	09-948	09-948	09-949	09-948
RE00-08-16534	00-604026	0.00–1.00	SED	09-949	09-948	09-949	09-949	09-949	09-949	09-948	09-948	09-949	09-948
RE00-08-16536	00-604026	1.75–2.75	QBT3	09-949	09-948	09-949	09-949	09-949	09-949	09-948	09-948	09-949	09-948

Note: Numbers in analyte columns are request numbers.

Table 6.16-2
Inorganic Chemicals above BVs at SWMU 01-003(b)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Calcium	Chromium	Copper	Lead	Magnesium	Nickel	Nitrate	Perchlorate	Selenium	Thallium
SOIL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**6120**	**19.3**	**14.7**	**22.3**	**4610**	**15.4**	**na**[b]	**na**	**1.52**	**0.73**
QBT3 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**2200**	**7.14**	**4.66**	**11.2**	**1690**	**6.58**	**na**	**na**	**0.3**	**1.1**
SED Background Value[a]				**15400**	**0.83**	**3.98**	**127**	**1.31**	**4420**	**10.5**	**11.2**	**19.7**	**2370**	**9.38**	**na**	**na**	**0.3**	**0.73**
RE00-08-16522	00-604022	0.00–1.00	SED	—[c]	—	—	—	1.5	—	—	—	—	—	—	0.17 (J)	—	0.5 (J)	—
RE00-08-16523	00-604022	2.00–3.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	0.14 (J)	—	—	—
RE00-08-16525	00-604023	0.00–1.00	FILL	—	—	—	—	—	—	—	—	28.6 (J+)	—	—	2.4	0.0022 (J-)	—	—
RE00-08-16526	00-604023	4.25–5.25	QBT3	10700	0.75 (U)	35.9	228	1.9	2630	14.5	11.5	73.1 (J+)	2090	9.7	0.2 (J)	0.039	1.4	1.8
RE00-08-16528	00-604024	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	0.15 (J)	—	—	—
RE00-08-16529	00-604024	1.25–2.25	QBT3	—	—	—	63.9	—	—	—	—	24.1 (J+)	—	—	0.11 (J)	—	0.36 (J)	—
RE00-08-16531	00-604025	0.00–1.00	SED	—	2.1 (U)	—	—	—	—	—	—	—	—	—	0.11 (J)	—	—	—
RE00-08-16532	00-604025	3.00–4.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	0.12 (J)	—	—	—
RE00-08-16536	00-604026	1.75–2.75	QBT3	—	—	—	—	—	—	—	—	—	—	—	0.078 (J)	—	0.37 (J)	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.16-3
Radionuclides Detected or Detected above BVs/FVs at SWMU 01-003(b)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-238	Plutonium-239/240
SOIL Background Value[a]				**1.65**[b]	**0.023**	**0.054**
SED Background Value[a]				**0.9**	**0.006**	**0.068**
QBT3 Background Value[a]				**na**[c]	**na**	**na**
RE00-08-16522	00-604022	0.00–1.00	SED	—[d]	—	0.361
RE00-08-16525	00-604023	0.00–1.00	FILL	0.168	—	1.63
RE00-08-16528	00-604024	0.00–1.00	SED	—	—	0.58
RE00-08-16531	00-604025	0.00–1.00	SED	—	—	2.11
RE00-08-16534	00-604026	0.00–1.00	SED	—	—	0.97
RE00-08-16536	00-604026	1.75–2.75	QBT3	—	0.178	0.492

Note: Results are in pCi/g.

[a] BVs/FVs are from LANL 1998, 059730.

[b] FV applies to soil and tuff samples collected from 0–0.5 ft only and applies to sediment samples of all depth.

[c] na = Not available.

[d] — = Not detected or not detected above BV/FV.

Table 6.17-1
Samples Collected and Analyses Requested at SWMU 01-003(d)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-16543	00-604027	0.00–1.20	SOIL	09-44	09-43	09-44	09-44	09-44	09-44	09-43	09-42	09-43	09-44	09-42	09-42	09-43
RE00-08-16544	00-604027	2.00–3.00	QBT3	09-44	09-43	09-44	09-44	09-44	09-44	09-43	09-42	09-43	09-44	09-42	09-42	09-43
RE00-08-16545	00-604028	0.00–1.00	SOIL	09-44	09-43	09-44	09-44	09-44	09-44	09-43	09-42	09-43	09-44	09-42	09-42	09-43
RE00-08-16546	00-604028	2.00–3.00	QBT3	09-44	09-43	09-44	09-44	09-44	09-44	09-43	09-42	09-43	09-44	09-42	09-42	09-43
RE00-08-16547	00-604029	0.00–1.00	QBT3	09-44	09-43	09-44	09-44	09-44	09-44	09-43	09-42	09-43	09-44	09-42	09-42	09-43
RE00-08-16548	00-604029	2.00–3.00	QBT3	09-44	09-43	09-44	09-44	09-44	09-44	09-43	09-42	09-43	09-44	09-42	09-42	09-43
RE00-08-16549	00-604030	0.00–1.00	SOIL	09-44	09-43	09-44	09-44	09-44	09-44	09-43	09-42	09-43	09-44	09-42	09-42	09-43
RE00-08-16550	00-604030	2.00–3.00	QBT3	09-44	09-43	09-44	09-44	09-44	09-44	09-43	09-42	09-43	09-44	09-42	09-42	09-43
RE00-08-16551	00-604031	0.00–1.00	SOIL	09-44	09-43	09-44	09-44	09-44	09-44	09-43	09-42	09-43	09-44	09-42	09-42	09-43
RE00-08-16552	00-604031	2.00–3.00	QBT3	09-44	09-43	09-44	09-44	09-44	09-44	09-43	09-42	09-43	09-44	09-42	09-42	09-43
RE00-08-16553	00-604032	0.00–1.00	QBT3	09-44	09-43	09-44	09-44	09-44	09-44	09-43	09-42	09-43	09-44	09-42	09-42	09-43
RE00-08-16554	00-604032	2.00–3.00	QBT3	09-44	09-43	09-44	09-44	09-44	09-44	09-43	09-42	09-43	09-44	09-42	09-42	09-43

Note: Numbers in analyte columns are request numbers.

Table 6.17-2
Inorganic Chemicals above BVs at SWMU 01-003(d)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Calcium	Chromium	Cyanide (Total)	Lead	Nitrate	Perchlorate	Selenium	Zinc
SOIL Background Value[a]				**0.83**	**295**	**1.83**	**6120**	**19.3**	**0.5**	**22.3**	**na**[b]	**na**	**1.52**	**48.8**
QBT3 Background Value[a]				**0.5**	**46**	**1.21**	**2200**	**7.14**	**0.5**	**11.2**	**na**	**na**	**0.3**	**63.5**
RE00-08-16543	00-604027	0.00–1.20	SOIL	—[c]	—	—	—	—	0.51 (UJ)	—	4.3	—	—	50 (J-)
RE00-08-16544	00-604027	2.00–3.00	QBT3	—	—	—	—	—	0.51 (UJ)	—	4.4	—	—	—
RE00-08-16545	00-604028	0.00–1.00	SOIL	18.4	—	—	—	—	—	62.1	39	0.0031 (J)	—	94.2 (J)
RE00-08-16546	00-604028	2.00–3.00	QBT3	1.6	—	—	—	—	—	—	5.8	—	—	—
RE00-08-16547	00-604029	0.00–1.00	QBT3	—	—	—	—	—	0.51 (UJ)	—	4.1	—	—	—
RE00-08-16549	00-604030	0.00–1.00	SOIL	—	—	—	—	—	0.51 (UJ)	—	0.15 (J)	—	—	—
RE00-08-16550	00-604030	2.00–3.00	QBT3	—	—	—	2880	—	—	—	—	0.0043 (J)	0.39 (J)	—
RE00-08-16551	00-604031	0.00–1.00	SOIL	10.6	—	—	—	—	0.51 (UJ)	—	0.9	0.0031 (J)	—	59.4 (J)
RE00-08-16552	00-604031	2.00–3.00	QBT3	—	—	—	—	11	—	—	0.22	—	0.33 (J)	—
RE00-08-16553	00-604032	0.00–1.00	QBT3	129	339	—	—	10.9	0.51 (UJ)	164	—	—	—	399 (J-)
RE00-08-16554	00-604032	2.00–3.00	QBT3	6.3	—	1.6	—	—	—	—	—	—	0.62	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] BVs are from LANL 1998, 059730.
[b] na = Not available.
[c] — = Not detected or not detected above BV.

Table 6.17-3
Organic Chemicals Detected at SWMU 01-003(d)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1260	Bis(2-ethylhexyl)phthalate	Toluene
RE00-08-16543	00-604027	0.00–1.20	SOIL	0.043	—*	—
RE00-08-16550	00-604030	2.00–3.00	QBT3	—	0.054 (J)	—
RE00-08-16551	00-604031	0.00–1.00	SOIL	—	—	0.0017 (J)
RE00-08-16553	00-604032	0.00–1.00	QBT3	—	—	0.00071 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.17-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 01-003(d)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240
SOIL Background Value[a]				**1.65**[b]	**0.054**[b]
QBT3 Background Value[a]				**na**[c]	**na**
RE00-08-16543	00-604027	0.00–1.20	SOIL	—[d]	0.364
RE00-08-16545	00-604028	0.00–1.00	SOIL	—	0.59
RE00-08-16547	00-604029	0.00–1.00	QBT3	—	0.139
RE00-08-16549	00-604030	0.00–1.00	SOIL	—	0.068
RE00-08-16551	00-604031	0.00–1.00	SOIL	—	0.194
RE00-08-16553	00-604032	0.00–1.00	QBT3	0.192	0.084

Note: Results are in pCi/g.
[a] BVs/FVs are from LANL 1998, 059730.
[b] FV applies to soil and tuff samples collected from 0–0.5 ft only.
[c] na = Not available.
[d] — = Not detected.

Table 6.18-1
Samples Collected and Analyses Requested at SWMU 01-003(e)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-16564	00-604033	0.00–1.00	FILL	09-47	09-46	09-47	09-47	09-47	09-47	09-46	09-45	09-46	09-47	09-45	09-45	09-46
RE00-08-16566	00-604034	0.00–1.00	FILL	09-47	09-46	09-47	09-47	09-47	09-47	09-46	09-45	09-46	09-47	09-45	09-45	09-46
RE00-08-16568	00-604035	0.00–1.00	FILL	09-47	09-46	09-47	09-47	09-47	09-47	09-46	09-45	09-46	09-47	09-45	09-45	09-46
RE00-08-16570	00-604036	0.00–1.00	FILL	09-47	09-46	09-47	09-47	09-47	09-47	09-46	09-45	09-46	09-47	09-45	09-45	09-46
RE00-08-16573	00-604037	0.00–1.00	FILL	09-47	09-46	09-47	09-47	09-47	09-47	09-46	09-45	09-46	09-47	09-45	09-45	09-46
RE00-08-16574	00-604038	0.00–1.00	FILL	09-47	09-46	09-47	09-47	09-47	09-47	09-46	09-45	09-46	09-47	09-45	09-45	09-46
RE00-08-16565	00-604219	0.00–1.00	SOIL	09-57	09-56	09-57	09-57	09-57	09-57	09-56	09-55	09-56	09-57	09-55	09-55	09-56
RE00-08-16567	00-604219	2.00–3.25	QBT3	09-57	09-56	09-57	09-57	09-57	09-57	09-56	09-55	09-56	09-57	09-55	09-55	09-56
RE00-08-16569	00-604220	0.00–1.00	SED	09-57	09-56	09-57	09-57	09-57	09-57	09-56	09-55	09-56	09-57	09-55	09-55	09-56
RE00-08-16571	00-604220	2.00–3.00	SED	09-57	09-56	09-57	09-57	09-57	09-57	09-56	09-55	09-56	09-57	09-55	09-55	09-56
RE00-08-16572	00-604221	0.00–1.00	SED	09-57	09-56	09-57	09-57	09-57	09-57	09-56	09-55	09-56	09-57	09-55	09-55	09-56
RE00-08-16575	00-604221	2.00–3.00	QBT3	09-57	09-56	09-57	09-57	09-57	09-57	09-56	09-55	09-56	09-57	09-55	09-55	09-56
RE00-08-16576	00-604222	0.00–1.00	SED	09-57	09-56	09-57	09-57	09-57	09-57	09-56	09-55	09-56	09-57	09-55	09-55	09-56
RE00-08-16577	00-604222	2.00–2.75	QBT3	09-57	09-56	09-57	09-57	09-57	09-57	09-56	09-55	09-56	09-57	09-55	09-55	09-56

Note: Numbers in analyte columns are request numbers.

Table 6.18-2
Inorganic Chemicals above BVs at SWMU 01-003(e)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Beryllium	Calcium	Cyanide (Total)	Lead	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Zinc
SOIL Background Value[a]				**0.83**	**1.83**	**6120**	**0.5**	**22.3**	**0.1**	**15.4**	**na**[b]	**na**	**1.52**	**48.8**
QBT3 Background Value[a]				**0.5**	**1.21**	**2200**	**0.5**	**11.2**	**0.1**	**6.58**	**na**	**na**	**0.3**	**63.5**
SED Background Value[a]				**0.83**	**1.31**	**4420**	**0.82**	**19.7**	**0.1**	**9.38**	**na**	**na**	**0.3**	**60.2**
RE00-08-16564	00-604033	0.00–1.00	FILL	—[c]	—	—	—	—	—	—	15.2	—	—	—
RE00-08-16566	00-604034	0.00–1.00	FILL	—	—	—	—	—	—	—	23.1	—	—	—
RE00-08-16568	00-604035	0.00–1.00	FILL	—	—	—	—	—	—	—	1.6	—	—	—
RE00-08-16570	00-604036	0.00–1.00	FILL	—	—	—	0.51 (U)	—	—	—	0.9	—	—	—
RE00-08-16573	00-604037	0.00–1.00	FILL	—	—	—	—	29.1 (J+)	—	—	6.9	—	—	—
RE00-08-16565	00-604219	0.00–1.00	SOIL	—	—	—	—	—	—	—	0.33	—	—	—
RE00-08-16567	00-604219	2.00–3.25	QBT3	0.51 (U)	—	—	0.51 (U)	—	—	7.9 (J-)	—	—	—	—
RE00-08-16569	00-604220	0.00–1.00	SED	—	—	—	—	22.2 (J+)	—	—	—	—	0.52 (U)	—
RE00-08-16571	00-604220	2.00–3.00	SED	1.9 (U)	—	—	—	30.6 (J+)	0.129	—	—	—	0.53 (U)	63.8 (J+)
RE00-08-16572	00-604221	0.00–1.00	SED	—	—	—	—	—	0.11	—	—	—	0.51 (U)	—
RE00-08-16575	00-604221	2.00–3.00	QBT3	—	2.5	6100 (J)	—	—	—	—	—	0.0062	0.46 (J)	—
RE00-08-16576	00-604222	0.00–1.00	SED	—	—	—	—	23.2 (J+)	—	—	—	—	0.55 (U)	—
RE00-08-16577	00-604222	2.00–2.75	QBT3	—	1.6	—	0.52 (U)	—	—	9.8 (J-)	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] BVs are from LANL 1998, 059730.
[b] na = Not available.
[c] — = Not detected or not detected above BV.

Table 6.18-3
Organic Chemicals Detected at SWMU 01-003(e)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Butanone[2-]	Butylbenzene[sec-]	Chloromethane	Chrysene	Di-n-butylphthalate	Dibenz(a,h)anthracene
RE00-08-16564	00-604033	0.00–1.00	FILL	0.075 (J)	0.11 (J)	—*	0.081 (J)	0.23 (J)	0.23 (J)	0.24 (J)	0.13 (J)	0.23 (J)	—	—	—	—	0.27 (J)	—	0.047 (J)
RE00-08-16566	00-604034	0.00–1.00	FILL	—	—	—	—	—	—	—	—	0.036 (J)	—	—	—	—	0.045 (J)	—	—
RE00-08-16568	00-604035	0.00–1.00	FILL	—	—	—	—	—	—	—	—	—	0.52	—	—	—	—	—	—
RE00-08-16570	00-604036	0.00–1.00	FILL	—	—	—	—	—	—	—	—	—	0.056 (J)	—	—	—	—	—	—
RE00-08-16573	00-604037	0.00–1.00	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16574	00-604038	0.00–1.00	FILL	—	—	—	0.027 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16565	00-604219	0.00–1.00	SOIL	—	—	—	—	0.048 (J)	0.059 (J)	—	—	—	—	0.0014 (J)	0.00077 (J)	0.00071 (J)	0.065 (J-)	—	—
RE00-08-16567	00-604219	2.00–3.25	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.046 (J)	—
RE00-08-16569	00-604220	0.00–1.00	SED	—	—	—	0.037	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16571	00-604220	2.00–3.00	SED	—	—	—	0.063 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16572	00-604221	0.00–1.00	SED	—	—	—	0.061 (J)	—	—	—	—	—	0.06 (J)	—	0.0008 (J)	—	—	0.045 (J)	—
RE00-08-16576	00-604222	0.00–1.00	SED	—	—	0.14	0.087	0.054 (J)	0.055 (J)	0.049 (J)	0.038 (J)	0.05 (J)	—	—	—	—	0.059 (J-)	—	—

Table 6.18-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenzofuran	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Naphthalene	Phenanthrene	Propylbenzene[1-]	Pyrene	Styrene	Tetrachloroethene	Toluene	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]
RE00-08-16564	00-604033	0.00–1.00	FILL	0.046 (J)	0.57	0.079 (J)	0.12 (J)	—	0.0025 (J)	0.082 (J)	0.48	—	0.53	—	—	—	—	—
RE00-08-16566	00-604034	0.00–1.00	FILL	—	0.085 (J)	—	—	—	0.0037 (J)	—	0.068 (J)	—	0.07 (J)	—	—	—	—	—
RE00-08-16568	00-604035	0.00–1.00	FILL	—	—	—	—	—	0.0037 (J)	—	—	—	—	—	—	—	—	—
RE00-08-16570	00-604036	0.00–1.00	FILL	—	0.056 (J)	—	—	—	0.0031 (J)	—	—	—	0.047 (J)	—	—	—	0.00039 (J)	—
RE00-08-16573	00-604037	0.00–1.00	FILL	—	—	—	—	—	0.0024 (J)	—	—	—	0.039 (J)	—	—	—	—	—
RE00-08-16574	00-604038	0.00–1.00	FILL	—	—	—	—	—	0.0012 (J)	—	—	—	—	—	—	—	—	—
RE00-08-16565	00-604219	0.00–1.00	SOIL	—	0.11 (J)	—	—	0.00016 (J)	—	—	0.089 (J)	—	0.14 (J)	0.00019 (J)	—	—	—	0.00012 (J)
RE00-08-16567	00-604219	2.00–3.25	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16569	00-604220	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	0.039 (J)	—	—	—	—	—
RE00-08-16571	00-604220	2.00–3.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16572	00-604221	0.00–1.00	SED	—	—	—	—	0.00013 (J)	—	—	—	0.00012 (J)	—	—	0.00016 (J)	0.00038 (J)	—	0.00011 (J)
RE00-08-16576	00-604222	0.00–1.00	SED	—	0.11 (J)	—	—	—	—	—	0.084 (J)	—	0.13 (J)	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.18-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 01-003(e)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Tritium
SOIL Background Value[a]				**1.65**[b]	**0.054**[b]	**na**[c]
SED Background Value[a]				**0.9**	**0.068**	**0.093**
RE00-08-16566	00-604034	0.00–1.00	FILL	0.111	0.0379	—[d]
RE00-08-16568	00-604035	0.00–1.00	FILL	—	0.061	0.64
RE00-08-16573	00-604037	0.00–1.00	FILL	0.162	0.057	—
RE00-08-16565	00-604219	0.00–1.00	SOIL	—	0.087	—
RE00-08-16569	00-604220	0.00–1.00	SED	—	0.152	—
RE00-08-16571	00-604220	2.00–3.00	SED	—	1.27	—
RE00-08-16572	00-604221	0.00–1.00	SED	—	1.04	—
RE00-08-16576	00-604222	0.00–1.00	SED	—	0.086	—

Note: Results are in pCi/g.

[a] BVs/FVs are from LANL 1998, 059730.

[b] FV applies to soil samples collected from 0–0.5 ft only and applies to sediment samples of all depth.

[c] na = Not available.

[d] — = Not detected or not detected above FV.

Table 6.19-1
Samples Collected and Analyses Requested at SWMU 01-006(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-16585	00-604039	0.00–1.0	SED	09-516	09-515	09-516	09-516	09-516	09-516	09-515	09-517	09-515	09-516	09-517	09-517	09-515
RE00-08-16586	00-604039	3.00–4.00	QBT3	09-516	09-515	09-516	09-516	09-516	09-516	09-515	09-517	09-515	09-516	09-517	09-517	09-515
RE00-08-16587	00-604040	0.00–1.00	SED	09-512	09-511	09-512	09-512	09-512	09-512	09-511	09-513	09-511	09-512	09-513	09-513	09-511
RE00-08-16588	00-604040	3.25–4.25	QBT3	09-512	09-511	09-512	09-512	09-512	09-512	09-511	09-513	09-511	09-512	09-513	09-513	09-511
RE00-08-16589	00-604041	0.00–1.00	FILL	09-516	09-515	09-516	09-516	09-516	09-516	09-515	09-517	09-515	09-516	09-517	09-517	09-515
RE00-08-16590	00-604041	4.00–5.00	QBT3	09-516	09-515	09-516	09-516	09-516	09-516	09-515	09-517	09-515	09-516	09-517	09-517	09-515
RE00-08-16591	00-604042	0.00–1.00	SOIL	09-512	09-511	09-512	09-512	09-512	09-512	09-511	09-513	09-511	09-512	09-513	09-513	09-511
RE00-08-16592	00-604042	2.25–3.25	QBT3	09-512	09-511	09-512	09-512	09-512	09-512	09-511	09-513	09-511	09-512	09-513	09-513	09-511
RE00-08-16593	00-604043	0.00–1.00	SED	09-512	09-511	09-512	09-512	09-512	09-512	09-511	09-513	09-511	09-512	09-513	09-513	09-511
RE00-08-16594	00-604043	1.00–2.00	QBT3	09-512	09-511	09-512	09-512	09-512	09-512	09-511	09-513	09-511	09-512	09-513	09-513	09-511
RE00-08-16595	00-604044	0.00–1.00	QBT3	09-516	09-515	09-516	09-516	09-516	09-516	09-515	09-517	09-515	09-516	09-517	09-517	09-515
RE00-08-16596	00-604044	1.00–2.00	QBT3	09-516	09-515	09-516	09-516	09-516	09-516	09-515	09-517	09-515	09-516	09-517	09-517	09-515
RE00-08-16597	00-604045	0.00–1.00	SED	09-516	09-515	09-516	09-516	09-516	09-516	09-515	09-517	09-515	09-516	09-517	09-517	09-515
RE00-08-16598	00-604045	1.00–2.00	QBT3	09-516	09-515	09-516	09-516	09-516	09-516	09-515	09-517	09-515	09-516	09-517	09-517	09-515
RE00-08-16599	00-604046	0.00–1.00	SED	09-516	09-515	09-516	09-516	09-516	09-516	09-515	09-517	09-515	09-516	09-517	09-517	09-515
RE00-08-16600	00-604046	1.50–2.50	QBT3	09-516	09-515	09-516	09-516	09-516	09-516	09-515	09-517	09-515	09-516	09-517	09-517	09-515
RE00-08-16601	00-604047	0.00–1.00	SOIL	09-542	09-541	09-542	09-542	09-542	09-542	09-541	09-540	09-541	09-542	09-540	09-540	09-541
RE00-08-16602	00-604047	1.50–2.50	SOIL	09-542	09-541	09-542	09-542	09-542	09-542	09-541	09-540	09-541	09-542	09-540	09-540	09-541
RE00-08-16603	00-604047	4.00–5.00	QBT3	09-542	09-541	09-542	09-542	09-542	09-542	09-541	09-540	09-541	09-542	09-540	09-540	09-541

Note: Numbers in analyte columns are request numbers.

Table 6.19-2
Inorganic Chemicals above BVs at SWMU 01-006(a)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Calcium	Chromium	Copper	Cyanide (Total)	Lead	Magnesium	Mercury	Nickel	Nitrate	Perchlorate	Selenium
SOIL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**6120**	**19.3**	**14.7**	**0.5**	**22.3**	**4610**	**0.1**	**15.4**	**na**[b]	**na**	**1.52**
QBT3 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**2200**	**7.14**	**4.66**	**0.5**	**11.2**	**1690**	**0.1**	**6.58**	**na**	**na**	**0.3**
SED Background Value[a]				**15400**	**0.83**	**3.98**	**127**	**1.31**	**4420**	**10.5**	**11.2**	**0.82**	**19.7**	**2370**	**0.1**	**9.38**	**na**	**na**	**0.3**
RE00-08-16585	00-604039	0.00–1.00	SED	—[c]	—	—	—	—	—	—	—	—	—	—	—	—	0.14 (J)	—	—
RE00-08-16586	00-604039	3.00–4.00	QBT3	—	—	2.8 (J)	—	—	—	8.4 (J+)	11.6	0.51 (UJ)	—	—	—	—	—	—	—
RE00-08-16587	00-604040	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	0.91	0.0026 (J)	—
RE00-08-16588	00-604040	3.25–4.25	QBT3	—	—	—	—	—	—	—	—	0.52 (U)	—	—	—	—	—	0.0034 (J)	—
RE00-08-16589	00-604041	0.00–1.00	FILL	—	—	—	—	—	—	—	—	0.53 (UJ)	—	—	—	—	—	—	—
RE00-08-16590	00-604041	4.00–5.00	QBT3	—	0.61 (U)	—	—	—	—	9.2 (J+)	5.5 (J)	0.53 (UJ)	14.6	—	—	—	0.4	0.0046 (J)	—
RE00-08-16591	00-604042	0.00–1.00	SOIL	—	—	—	—	—	—	—	—	0.55 (U)	—	—	—	—	—	—	—
RE00-08-16592	00-604042	2.25–3.25	QBT3	9970 (J)	0.54 (U)	5.5	235 (J)	1.5 (J)	2720 (J)	9.2 (J)	5.3 (J)	0.58 (U)	21.2 (J)	2420 (J)	—	7.6 (J)	0.39	0.017	—
RE00-08-16593	00-604043	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	42.8 (J)	—	—	—	2.3	—	—
RE00-08-16594	00-604043	1.00–2.00	QBT3	—	—	—	—	—	—	18.5 (J-)	—	0.51 (U)	—	—	—	8.4 (J-)	—	—	—
RE00-08-16595	00-604044	0.00–1.00	QBT3	—	—	3.1 (J)	55	—	—	11.5 (J+)	4.7 (J)	0.52 (UJ)	12.6	—	—	—	—	—	—
RE00-08-16596	00-604044	1.00–2.00	QBT3	—	—	3.1 (J)	54	—	—	17.8 (J+)	—	—	—	—	—	9	0.096 (J)	—	—
RE00-08-16597	00-604045	0.00–1.00	SED	—	—	—	—	—	7640	—	—	—	—	—	—	—	0.43	—	—
RE00-08-16598	00-604045	1.00–2.00	QBT3	—	—	—	—	—	5490	—	—	0.51 (UJ)	—	—	—	—	0.16 (J)	—	—
RE00-08-16599	00-604046	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	0.084 (J)	—	0.53 (U)
RE00-08-16600	00-604046	1.50–2.50	QBT3	—	—	—	—	—	—	—	—	0.51 (UJ)	—	—	—	—	—	—	—
RE00-08-16601	00-604047	0.00–1.00	SOIL	—	—	—	—	—	—	—	—	—	—	—	0.203	—	0.15 (J)	—	—
RE00-08-16602	00-604047	1.50–2.50	SOIL	—	—	—	—	—	—	—	—	0.6 (U)	—	—	—	—	—	0.0039 (J)	—
RE00-08-16603	00-604047	4.00–5.00	QBT3	—	—	—	—	—	—	14.5 (J)	—	—	—	—	—	7.5 (J)	—	—	0.35 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.19-3
Organic Chemicals Detected at SWMU 01-006(a)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Aroclor-1260	Bis(2-ethylhexyl)phthalate	Di-n-butylphthalate	Methylene Chloride
RE00-08-16585	00-604039	0.00–1.00	SED	—*	0.049	—	—	—
RE00-08-16586	00-604039	3.00–4.00	QBT3	—	0.013 (J)	—	—	0.0089
RE00-08-16587	00-604040	0.00–1.00	SED	—	0.052	—	—	0.0017 (J)
RE00-08-16588	00-604040	3.25–4.25	QBT3	—	0.0085 (J)	—	—	0.0036 (J)
RE00-08-16589	00-604041	0.00–1.00	FILL	—	0.021 (J)	—	—	—
RE00-08-16590	00-604041	4.00–5.00	QBT3	—	0.013 (J)	—	—	—
RE00-08-16591	00-604042	0.00–1.00	SOIL	—	0.02 (J)	—	—	0.0025 (J)
RE00-08-16592	00-604042	2.25–3.25	QBT3	0.0049 (J)	—	0.057 (J)	—	0.0014 (J)
RE00-08-16593	00-604043	0.00–1.00	SED	—	0.009 (J)	—	0.054 (J)	—
RE00-08-16595	00-604044	0.00–1.00	QBT3	—	0.0081 (J)	—	—	—
RE00-08-16597	00-604045	0.00–1.00	SED	—	0.0083 (J)	0.097 (J)	0.15 (J)	—
RE00-08-16599	00-604046	0.00–1.00	SED	—	0.012 (J)	—	—	0.0093
RE00-08-16601	00-604047	0.00–1.00	SOIL	—	0.029 (J)	—	—	0.021 (J)
RE00-08-16602	00-604047	1.50–2.50	SOIL	—	0.038 (J)	—	—	0.025 (J)
RE00-08-16603	00-604047	4.00–5.00	QBT3	—	—	2.7 (J)	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.19-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 01-006(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-239/240	Uranium-234	Uranium-235/236	Uranium-238
SOIL Background Value[a]				**0.013**[b]	**1.65**[b]	**0.054**[b]	**2.59**	**0.2**	**2.29**
QBT3 Background Value[a]				**na**[c]	**na**	**na**	**1.98**	**0.09**	**1.93**
SED Background Value[a]				**0.04**	**0.9**	**0.068**	**2.59**	**0.2**	**2.29**
RE00-08-16585	00-604039	0.00–1.00	SED	—[d]	—	4.45	—	—	—
RE00-08-16586	00-604039	3.00–4.00	QBT3	—	—	1.61	—	—	—
RE00-08-16587	00-604040	0.00–1.00	SED	—	—	5.52	—	—	—
RE00-08-16588	00-604040	3.25–4.25	QBT3	—	—	0.88 (J)	—	—	—
RE00-08-16589	00-604041	0.00–1.00	FILL	—	—	1.92	—	—	—
RE00-08-16590	00-604041	4.00–5.00	QBT3	—	—	7.1	—	0.214	—
RE00-08-16591	00-604042	0.00–1.00	SOIL	0.187 (J)	0.111	0.694 (J)	—	—	—
RE00-08-16593	00-604043	0.00–1.00	SED	0.466 (J)	—	25.8	—	0.329	—
RE00-08-16594	00-604043	1.00–2.00	QBT3	—	—	8.23	—	—	—
RE00-08-16595	00-604044	0.00–1.00	QBT3	—	—	1.2	—	—	—
RE00-08-16596	00-604044	1.00–2.00	QBT3	—	—	0.116	—	0.173	—
RE00-08-16597	00-604045	0.00–1.00	SED	—	—	4.07	4.15 (J)	0.357	3.12
RE00-08-16598	00-604045	1.00–2.00	QBT3	—	—	0.524	—	0.198	—
RE00-08-16599	00-604046	0.00–1.00	SED	—	—	0.59	—	—	—
RE00-08-16600	00-604046	1.50–2.50	QBT3	—	—	0.093	—	—	—
RE00-08-16601	00-604047	0.00–1.00	SOIL	—	—	2.42	—	—	—
RE00-08-16602	00-604047	1.50–2.50	SOIL	—	—	4.08	—	—	—
RE00-08-16603	00-604047	4.00–5.00	QBT3	—	—	0.109	—	—	—

Notes: Results are in pCi/g. Data qualifiers are presented in Appendix A.

[a] BVs/FVs are from are from LANL 1998, 059730.

[b] FV applies to soil and tuff samples collected from 0–0.5 ft only and applies to sediment samples of all depth.

[c] na = Not available.

[d] — = Not detected or not detected above BV/FV.

Table 6.20-1
Samples Collected and Analyses Requested at SWMU 01-006(b)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-09-204	00-604223	15.00–16.00	QBT3	09-426	09-425	09-426	09-426	09-426	09-426	09-425	09-424	09-425	09-426	09-424	09-424	09-425
RE00-09-205	00-604223	17.00–18.00	QBT3	09-426	09-425	09-426	09-426	09-426	09-426	09-425	09-424	09-425	09-426	09-424	09-424	09-425
RE00-09-206	00-604224	0.00–1.00	SED	09-398	09-397	09-398	09-398	09-398	09-398	09-397	09-396	09-397	09-398	09-396	09-396	09-397
RE00-09-207	00-604224	1.00–2.00	QBT3	09-398	09-397	09-398	09-398	09-398	09-398	09-397	09-396	09-397	09-398	09-396	09-396	09-397
RE00-09-208	00-604225	0.00–1.00	SOIL	09-398	09-397	09-398	09-398	09-398	09-398	09-397	09-396	09-397	09-398	09-396	09-396	09-397
RE00-09-209	00-604225	1.00–2.00	QBT3	09-398	09-397	09-398	09-398	09-398	09-398	09-397	09-396	09-397	09-398	09-396	09-396	09-397
RE00-09-210	00-604226	0.00–1.00	SOIL	09-398	09-397	09-398	09-398	09-398	09-398	09-397	09-396	09-397	09-398	09-396	09-396	09-397
RE00-09-211	00-604226	1.25–2.25	QBT3	09-398	09-397	09-398	09-398	09-398	09-398	09-397	09-396	09-397	09-398	09-396	09-396	09-397
RE00-09-232	00-604237	0.00–1.00	SOIL	09-398	09-397	09-398	09-398	09-398	09-398	09-397	09-396	09-397	09-398	09-396	09-396	09-397
RE00-09-233	00-604237	2.00–3.00	SOIL	09-398	09-397	09-398	09-398	09-398	09-398	09-397	09-396	09-397	09-398	09-396	09-396	09-397
RE00-09-234	00-604237	4.00–5.00	QBT3	09-398	09-397	09-398	09-398	09-398	09-398	09-397	09-396	09-397	09-398	09-396	09-396	09-397

Note: Numbers in analyte columns are request numbers.

Table 6.20-2
Inorganic Chemicals above BVs at SWMU 01-006(b)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Chromium	Copper	Cyanide (Total)	Lead	Mercury	Nickel	Nitrate	Perchlorate	Selenium
QBT3 Background Value[a]				**0.5**	**7.14**	**4.66**	**0.5**	**11.2**	**0.1**	**6.58**	**na**[b]	**na**	**0.3**
SED Background Value[a]				**0.83**	**10.5**	**11.2**	**0.82**	**19.7**	**0.1**	**9.38**	**na**	**na**	**0.3**
SOIL Background Value[a]				**0.83**	**19.3**	**14.7**	**0.5**	**22.3**	**0.1**	**15.4**	**na**	**na**	**1.52**
RE00-09-204	00-604223	15.00–16.00	QBT3	0.54 (U)	—[c]	—	0.54 (UJ)	—	—	—	4.9	—	0.54 (U)
RE00-09-205	00-604223	17.00–18.00	QBT3	—	29.9 (J-)	—	—	—	—	14	4.2	—	0.53 (U)
RE00-09-206	00-604224	0.00–1.00	SED	—	—	—	—	34.3 (J)	—	10.1 (J)	0.25	—	0.52 (U)
RE00-09-207	00-604224	1.00–2.00	QBT3	—	—	—	—	13.2	—	—	0.16 (J)	—	0.51 (U)
RE00-09-208	00-604225	0.00–1.00	SOIL	1.5 (U)	—	—	0.71	61.1	0.123	—	0.35	0.0031 (J)	—
RE00-09-209	00-604225	1.00–2.00	QBT3	0.59 (U)	—	—	—	44.3	0.115	—	0.18 (J)	0.0075	0.52 (U)
RE00-09-210	00-604226	0.00–1.00	SOIL	—	—	—	—	—	—	—	0.16 (J)	—	—
RE00-09-211	00-604226	1.25–2.25	QBT3	—	—	4.7	0.62	21.2	—	8.4 (J)	0.14 (J)	—	0.51 (U)
RE00-09-232	00-604237	0.00–1.00	SOIL	3.3 (U)	—	—	—	26.6	—	—	1	—	—
RE00-09-233	00-604237	2.00–3.00	SOIL	1.5 (U)	—	—	—	32.4	—	—	0.17 (J)	0.0028 (J)	—
RE00-09-234	00-604237	4.00–5.00	QBT3	—	—	—	0.52 (U)	—	—	—	0.18 (J)	—	0.52 (U)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] BVs are from LANL 1998, 059730.
[b] na = Not available.
[c] — = Not detected or not detected above BV.

Table 6.20-3
Organic Chemicals Detected at SWMU 01-006(b)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Chrysene	Dinitro-2-methylphenol[4,6-]	Fluoranthene	Isopropyltoluene[4-]	Methylene Chloride	Phenanthrene	Pyrene	Trichlorofluoromethane
RE00-09-204	00-604223	15.00–16.00	QBT3	—*	0.0081 (J)	—	—	—	—	—	—	—	—	—	—	—	—	0.0064	—	—	—
RE00-09-205	00-604223	17.00–18.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	0.41 (J)	—	—	—	—	—	—
RE00-09-206	00-604224	0.00–1.00	SED	0.024 (J)	0.021 (J)	—	—	0.042 (J)	—	—	—	0.21 (J)	—	0.036 (J)	—	0.05 (J)	—	—	—	0.039 (J)	—
RE00-09-208	00-604225	0.00–1.00	SOIL	—	0.014 (J)	0.051 (J)	0.057 (J)	0.068 (J)	0.04 (J)	0.056 (J)	—	—	—	0.058 (J)	—	0.087 (J)	—	—	—	0.088 (J)	—
RE00-09-209	00-604225	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	0.22 (J)	—	—	—	—	0.00054 (J)	—	—	—	—
RE00-09-210	00-604226	0.00–1.00	SOIL	0.037 (J)	0.033 (J)	0.038 (J)	0.045 (J)	0.058 (J)	—	0.052 (J)	—	—	—	0.051 (J)	—	0.092 (J)	—	—	0.047 (J)	0.069 (J)	—
RE00-09-211	00-604226	1.25–2.25	QBT3	—	0.0062 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-232	00-604237	0.00–1.00	SOIL	—	0.014 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-233	00-604237	2.00–3.00	SOIL	—	—	—	—	—	0.068 (J)	—	0.6 (J)	—	0.075 (J)	—	—	—	—	—	—	—	0.0013 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.20-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 01-006(b)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Plutonium-239/240
QBT3 Background Value[a]				**na**[b]	**na**
SED Background Value[a]				**0.04**	**0.068**
SOIL Background Value[a]				**0.013**[c]	**0.054**[c]
RE00-09-204	00-604223	15.00–16.00	QBT3	—[d]	0.476
RE00-09-206	00-604224	0.00–1.00	SED	0.334	33.5
RE00-09-207	00-604224	1.00–2.00	QBT3	—	0.941
RE00-09-208	00-604225	0.00–1.00	SOIL	5.8 (J)	451
RE00-09-209	00-604225	1.00–2.00	QBT3	1.51	113
RE00-09-210	00-604226	0.00–1.00	SOIL	0.116	4.49
RE00-09-211	00-604226	1.25–2.25	QBT3	—	4.44
RE00-09-232	00-604237	0.00–1.00	SOIL	0.556	34.3
RE00-09-233	00-604237	2.00–3.00	SOIL	15.4 (J)	1030
RE00-09-234	00-604237	4.00–5.00	QBT3	0.4	40.3

Notes: Results are in pCi/g. Data qualifiers are presented in Appendix A.
[a] BVs/FVs are from LANL 1998, 059730.
[b] na = Not available.
[c] FV applies to soil and tuff samples collected from 0–0.5 ft only and applies to sediment samples of all depth.
[d] — = Not detected or not detected above FV.

Table 6.21-1
Samples Collected and Analyses Requested at SWMU 01-006(c)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-15731	00-603783	0.00–1.00	SED	09-364	09-362	09-364	09-364	09-364	09-364	09-362	09-363	09-362	09-364	09-363	09-363	09-362
RE00-08-15732	00-603783	2.75–4.00	QBT3	09-364	09-362	09-364	09-364	09-364	09-364	09-362	09-363	09-362	09-364	09-363	09-363	09-362

Note: Numbers in analyte columns are request numbers.

Table 6.21-2
Inorganic Chemicals above BVs at SWMU 01-006(c)

Sample ID	Location ID	Depth (ft)	Media	Barium	Chromium	Cobalt	Cyanide (Total)	Lead	Manganese	Nickel	Nitrate	Perchlorate	Selenium	Thallium	Zinc
QBT3 Background Value[a]				**46**	**7.14**	**3.14**	**0.5**	**11.2**	**482**	**6.58**	**na**[b]	**na**	**0.3**	**1.1**	**63.5**
SED Background Value[a]				**127**	**10.5**	**4.73**	**0.82**	**19.7**	**543**	**9.38**	**na**	**na**	**0.3**	**0.73**	**60.2**
RE00-08-15731	00-603783	0.00–1.00	SED	172	—[c]	8.8	—	67.9 (J-)	764 (J-)	—	—	—	2.6 (U)	1 (U)	76.7
RE00-08-15732	00-603783	2.75–4.00	QBT3	82.1	29.2	—	0.53 (UJ)	—	—	15.8	0.34	0.0025 (J)	0.53 (U)	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] BVs are from LANL 1998, 059730.
[b] na = Not available.
[c] — = Not detected or not detected above BV.

Table 6.21-3
Organic Chemicals Detected at SWMU 01-006(c)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzofuran	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene
RE00-08-15731	00-603783	0.00–1.00	SED	—*	0.037 (J)	0.046 (J)	0.037 (J)	—	—	0.041 (J)	0.053 (J)	—	0.1 (J)	—	—	—	—	—	0.12 (J)	0.093 (J)
RE00-08-15732	00-603783	2.75–4.00	QBT3	0.28 (J)	0.47	0.41	0.37	0.29 (J)	0.13 (J)	0.35	0.45	0.14 (J)	0.95	0.25 (J)	0.11 (J)	0.00088 (J)	0.045 (J)	0.11 (J)	1.4	0.89

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.21-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 01-006(c)

Sample ID	Location ID	Depth (ft)	Media	Plutonium-239/240
QBT3 Background Value[a]				**na**[b]
SED Background Value[a]				**0.068**
RE00-08-15731	00-603783	0.00–1.00	SED	0.492
RE00-08-15732	00-603783	2.75–4.00	QBT3	0.679

Note: Results are in pCi/g.
[a] BVs/FVs are from LANL 1998, 059730.
[b] na = Not available.

Table 6.22-1
Samples Collected and Analyses Requested at SWMU 01-006(d)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-15733	00-603784	0.00–1.00	SED	09-364	09-362	09-364	09-364	09-364	09-364	09-362	09-363	09-362	09-364	09-363	09-363	09-362
RE00-08-15734	00-603784	4.50–5.75	QBT3	09-364	09-362	09-364	09-364	09-364	09-364	09-362	09-363	09-362	09-364	09-363	09-363	09-362

Note: Numbers in analyte columns are request numbers.

Table 6.22-2
Inorganic Chemicals above BVs at SWMU 01-006(d)

Sample ID	Location ID	Depth (ft)	Media	Cyanide (Total)	Mercury	Selenium
QBT3 Background Value[a]				**0.5**	**0.1**	**0.3**
SED Background Value[a]				**0.82**	**0.1**	**0.3**
RE00-08-15733	00-603784	0.00–1.00	SED	—[b]	0.122	0.52 (U)
RE00-08-15734	00-603784	4.50–5.75	QBT3	0.51 (UJ)	0.122	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] BVs are from LANL 1998, 059730.
[b] — = Not detected or not detected above BV.

Table 6.22-3
Organic Chemicals Detected at SWMU 01-006(d)

Sample ID	Location ID	Depth (ft)	Media	Fluoranthene	Pyrene
RE00-08-15733	00–603784	0.00–1.00	SED	0.053 (J)	0.053 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

Table 6.23-1
Samples Collected and Analyses Requested at AOC 01-006(e)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-16284	00-603872	9.00–10.00	QBT3	09-770	09-769	09-770	09-770	09-770	09-770	09-769	09-771	09-769	09-770	09-771	09-771	09-769
RE00-08-16285	00-603872	11.00–12.00	QBT3	09-770	09-769	09-770	09-770	09-770	09-770	09-769	09-771	09-769	09-770	09-771	09-771	09-769
RE00-08-16288	00-603874	5.00–6.00	QBT3	09-770	09-769	09-770	09-770	09-770	09-770	09-769	09-771	09-769	09-770	09-771	09-771	09-769
RE00-08-16289	00-603874	7.00–8.00	QBT3	09-770	09-769	09-770	09-770	09-770	09-770	09-769	09-771	09-769	09-770	09-771	09-771	09-769
RE00-08-16292	00-603876	4.00–5.00	QBT3	09-770	09-769	09-770	09-770	09-770	09-770	09-769	09-771	09-769	09-770	09-771	09-771	09-769
RE00-08-16293	00-603876	6.00–7.00	QBT3	09-770	09-769	09-770	09-770	09-770	09-770	09-769	09-771	09-769	09-770	09-771	09-771	09-769

Note: Numbers in analyte columns are request numbers.

Table 6.23-2
Inorganic Chemicals above BVs at AOC 01-006(e)

Sample ID	Location ID	Depth (ft)	Media	Arsenic	Barium	Chromium	Cyanide (Total)	Nickel	Selenium
QBT3 Background Value[a]				**2.79**	**46**	**7.14**	**0.5**	**6.58**	**0.3**
RE00-08-16284	00-603872	9.00–10.00	QBT3	—[b]	—	—	—	—	0.59 (U)
RE00-08-16285	00-603872	11.00–12.00	QBT3	—	—	—	—	—	0.6 (U)
RE00-08-16288	00-603874	5.00–6.00	QBT3	—	69.4	—	0.61 (UJ)	—	0.61 (U)
RE00-08-16289	00-603874	7.00–8.00	QBT3	2.9	106	9	0.61 (UJ)	—	0.61 (U)
RE00-08-16292	00-603876	4.00–5.00	QBT3	—	—	9.4	0.57 (UJ)	—	0.57 (U)
RE00-08-16293	00-603876	6.00–7.00	QBT3	—	—	20.4	—	11.2	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] BVs are from LANL 1998, 059730.
[b] — = Not detected or not detected above BV.

Table 6.23-3
Organic Chemicals Detected at AOC 01-006(e)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Benzyl Alcohol
RE00-08-16285	00-603872	11.00–12.00	QBT3	0.0063 (J)	—*
RE00-08-16289	00-603874	7.00–8.00	QBT3	0.0033 (J)	—
RE00-08-16293	00-603876	6.00–7.00	QBT3	—	1.8

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.24-1
Samples Collected and Analyses Requested at AOC 01-006(g)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-16613	00-604048	0.00–1.00	SED	09-509	09-508	09-509	09-509	09-509	09-509	09-508	09-510	09-508	09-509	09-510	09-510	09-508
RE00-08-16614	00-604048	1.00–2.00	QBT3	09-509	09-508	09-509	09-509	09-509	09-509	09-508	09-510	09-508	09-509	09-510	09-510	09-508
RE00-08-16615	00-604049	0.00–1.00	SED	09-509	09-508	09-509	09-509	09-509	09-509	09-508	09-510	09-508	09-509	09-510	09-510	09-508
RE00-08-16616	00-604049	3.25–4.25	QBT3	09-509	09-508	09-509	09-509	09-509	09-509	09-508	09-510	09-508	09-509	09-510	09-510	09-508
RE00-08-16617	00-604050	0.00–1.00	SED	09-509	09-508	09-509	09-509	09-509	09-509	09-508	09-510	09-508	09-509	09-510	09-510	09-508
RE00-08-16618	00-604050	2.50–3.50	QBT3	09-509	09-508	09-509	09-509	09-509	09-509	09-508	09-510	09-508	09-509	09-510	09-510	09-508
RE00-08-16619	00-604051	0.00–1.00	SOIL	09-539	09-538	09-539	09-539	09-539	09-539	09-538	09-537	09-538	09-539	09-537	09-537	09-538
RE00-08-16620	00-604051	1.50–2.50	QBT3	09-539	09-538	09-539	09-539	09-539	09-539	09-538	09-537	09-538	09-539	09-537	09-537	09-538
RE00-08-16621	00-604051	4.00–5.00	QBT3	09-539	09-538	09-539	09-539	09-539	09-539	09-538	09-537	09-538	09-539	09-537	09-537	09-538

Note: Numbers in analyte columns are request numbers.

Table 6.24-2
Inorganic Chemicals above BVs at AOC 01-006(g)

Sample ID	Location ID	Depth (ft)	Media	Arsenic	Barium	Chromium	Copper	Cyanide (Total)	Nickel	Nitrate	Perchlorate	Selenium
SOIL Background Value[a]				**8.17**	**295**	**19.3**	**14.7**	**0.5**	**15.4**	**na**[b]	**na**	**1.52**
QBT3 Background Value[a]				**2.79**	**46**	**7.14**	**4.66**	**0.5**	**6.58**	**na**	**na**	**0.3**
SED Background Value[a]				**3.98**	**127**	**10.5**	**11.2**	**0.82**	**9.38**	**na**	**na**	**0.3**
RE00-08-16613	00-604048	0.00–1.00	SED	5.2 (J)	—[c]	—	—	—	—	0.48	—	—
RE00-08-16614	00-604048	1.00–2.00	QBT3	—	—	12.8 (J)	—	0.53 (U)	7	0.11 (J)	—	—
RE00-08-16615	00-604049	0.00–1.00	SED	4.9 (J)	—	—	12.5	—	—	1.1	0.0026 (J)	—
RE00-08-16616	00-604049	3.25–4.25	QBT3	—	—	13.1 (J-)	—	0.53 (UJ)	8.8 (J-)	—	0.0087	—
RE00-08-16617	00-604050	0.00–1.00	SED	—	—	—	—	—	—	0.74	0.0028 (J)	—
RE00-08-16618	00-604050	2.50–3.50	QBT3	—	76.5	17 (J)	—	0.53 (UJ)	11.1	—	0.029	—
RE00-08-16619	00-604051	0.00–1.00	SOIL	—	—	—	—	—	—	30.3	—	—
RE00-08-16620	00-604051	1.50–2.50	QBT3	—	—	15.9 (J)	—	—	8.2 (J)	4.4	—	—
RE00-08-16621	00-604051	4.00–5.00	QBT3	—	—	16.7 (J)	—	—	8.5 (J)	2.8	—	0.31 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.24-3
Organic Chemicals Detected at AOC 01-006(g)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1260	Bis(2-ethylhexyl)phthalate	Methylene Chloride	Trimethylbenzene[1,2,4-]
RE00-08-16613	00-604048	0.00–1.00	SED	0.015 (J)	—*	—	0.00031 (J)
RE00-08-16615	00-604049	0.00–1.00	SED	0.02 (J)	0.056 (J)	—	—
RE00-08-16616	00-604049	3.25–4.25	QBT3	0.0051 (J)	0.048 (J)	—	0.00032 (J)
RE00-08-16617	00-604050	0.00–1.00	SED	0.0073 (J)	—	—	—
RE00-08-16619	00-604051	0.00–1.00	SOIL	0.013 (J)	—	0.029	—
RE00-08-16620	00-604051	1.50–2.50	QBT3	—	—	0.027	—
RE00-08-16621	00-604051	4.00–5.00	QBT3	—	—	0.028	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.24-4
Radionuclides Detected or Detected above BVs/FVs at AOC 01-006(g)

Sample ID	Location ID	Depth (ft)	Media	Plutonium-239/240
SOIL Background Value[a]				**0.054**[b]
QBT3 Background Value[a]				**na**[c]
SED Background Value[a]				**0.068**
RE00-08-16613	00-604048	0.00–1.00	SED	0.77 (J)
RE00-08-16615	00-604049	0.00–1.00	SED	1.67 (J)
RE00-08-16617	00-604050	0.00–1.00	SED	1.69 (J)
RE00-08-16618	00-604050	2.50–3.50	QBT3	0.347 (J)
RE00-08-16619	00-604051	0.00–1.00	SOIL	0.577

Notes: Results are in pCi/g. Data qualifiers are presented in Appendix A.
[a] BVs/FVs are from LANL 1998, 059730.
[b] FV applies to samples collected from 0–-0.5 ft only.
[c] na = Not available.

Table 6.26-1
Samples Collected and Analyses Requested at SWMU 01-006(n)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-09-212	00-604227	0.00–1.00	FILL	09-398	09-397	09-398	09-398	09-398	09-398	09-397	09-396	09-397	09-398	09-396	09-396	09-397
RE00-09-213	00-604227	7.00–8.00	QBT3	09-398	09-397	09-398	09-398	09-398	09-398	09-397	09-396	09-397	09-398	09-396	09-396	09-397
RE00-09-214	00-604228	0.00–1.00	FILL	09-398	09-397	09-398	09-398	09-398	09-398	09-397	09-396	09-397	09-398	09-396	09-396	09-397
RE00-09-215	00-604228	8.25–9.25	QBT3	09-426	09-425	09-426	09-426	09-426	09-426	09-425	09-424	09-425	09-426	09-424	09-424	09-425
RE00-09-216	00-604229	0.00–1.00	FILL	09-426	09-425	09-426	09-426	09-426	09-426	09-425	09-424	09-425	09-426	09-424	09-424	09-425
RE00-09-217	00-604229	1.00–2.00	QBT3	09-426	09-425	09-426	09-426	09-426	09-426	09-425	09-424	09-425	09-426	09-424	09-424	09-425
RE00-09-235	00-604238	0.00–1.00	FILL	09-426	09-425	09-426	09-426	09-426	09-426	09-425	09-424	09-425	09-426	09-424	09-424	09-425
RE00-09-236	00-604238	1.50–2.50	FILL	09-426	09-425	09-426	09-426	09-426	09-426	09-425	09-424	09-425	09-426	09-424	09-424	09-425
RE00-09-237	00-604238	4.00–5.00	FILL	09-426	09-425	09-426	09-426	09-426	09-426	09-425	09-424	09-425	09-426	09-424	09-424	09-425
RE00-09-246	00-604238	6.50–7.50	QBT3	09-426	09-425	09-426	09-426	09-426	09-426	09-425	09-424	09-425	09-426	09-424	09-424	09-425

Note: Numbers in analyte columns are request numbers.

Table 6.26-2
Inorganic Chemicals above BVs at SWMU 01-006(n)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Calcium	Chromium	Cyanide (Total)	Lead	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Zinc
SOIL Background Value[a]				**0.83**	**6120**	**19.3**	**0.5**	**22.3**	**0.1**	**15.4**	**na**[b]	**na**	**1.52**	**48.8**
QBT3 Background Value[a]				**0.5**	**2200**	**7.14**	**0.5**	**11.2**	**0.1**	**6.58**	**na**	**na**	**0.3**	**63.5**
RE00-09-212	00-604227	0.00–1.00	FILL	—[c]	—	—	0.52 (U)	—	0.124	—	0.62	—	—	—
RE00-09-213	00-604227	7.00–8.00	QBT3	0.51 (U)	—	—	—	—	—	—	0.19 (J)	—	—	—
RE00-09-214	00-604228	0.00–1.00	FILL	—	—	—	—	—	—	—	0.38	—	—	—
RE00-09-215	00-604228	8.25–9.25	QBT3	0.51 (U)	—	—	—	—	—	—	0.12 (J)	—	0.51 (U)	—
RE00-09-216	00-604229	0.00–1.00	FILL	—	—	—	0.52 (UJ)	—	0.121 (J)	—	0.13 (J)	—	—	—
RE00-09-217	00-604229	1.00–2.00	QBT3	0.51 (U)	—	—	0.51 (UJ)	—	—	—	—	0.0027 (J)	0.51 (U)	—
RE00-09-235	00-604238	0.00–1.00	FILL	—	—	—	—	—	—	—	26 (J-)	—	—	—
RE00-09-236	00-604238	1.50–2.50	FILL	—	—	—	0.53 (UJ)	—	0.143 (J)	—	0.66	0.0055	—	—
RE00-09-237	00-604238	4.00–5.00	FILL	—	6220	—	—	44.1	0.555 (J)	—	0.47	0.016	—	54.3
RE00-09-246	00-604238	6.50–7.50	QBT3	—	—	18.9 (J-)	0.51 (UJ)	—	—	9.3	0.085 (J)	—	0.42 (J)	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.26-3
Organic Chemicals Detected at SWMU 01-006(n)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Chrysene	Fluoranthene	Methylene Chloride	Phenanthrene	Pyrene	Trichlorofluoromethane
RE00-09-212	00-604227	0.00–1.00	FILL	—*	0.043 (J)	0.053 (J)	0.039 (J)	0.065 (J)	0.67	0.051 (J)	0.094 (J)	—	0.078 (J)	0.081 (J)	0.0012 (J)
RE00-09-213	00-604227	7.00–8.00	QBT3	0.011 (J)	—	—	—	—	—	—	—	—	—	—	—
RE00-09-215	00-604228	8.25–9.25	QBT3	—	—	—	—	—	—	—	—	0.0046 (J)	—	—	—
RE00-09-216	00-604229	0.00–1.00	FILL	0.52	—	—	—	—	—	—	0.053 (J)	0.0066	0.046 (J)	0.047 (J)	—
RE00-09-217	00-604229	1.00–2.00	QBT3	0.14	—	—	—	—	—	—	0.043 (J)	0.0059	0.043 (J)	0.035 (J)	—
RE00-09-235	00-604238	0.00–1.00	FILL	0.015 (J)	—	—	—	—	—	—	—	0.0079	—	—	—
RE00-09-236	00-604238	1.50–2.50	FILL	0.013 (J)	0.06 (J)	0.043 (J)	0.044 (J)	0.042 (J)	—	0.07 (J)	0.099 (J)	—	—	0.089 (J)	—
RE00-09-237	00-604238	4.00–5.00	FILL	0.17	—	—	—	—	—	—	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.26-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 01-006(n)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-134	Plutonium-239/240	Tritium
SOIL Background Value[a]				**0.013**[b]	**na**[c]	**0.054**[b]	**na**
QBT3 Background Value[a]				**na**	**na**	**na**	**na**
RE00-09-212	00-604227	0.00–1.00	FILL	—[d]	—	0.13	—
RE00-09-213	00-604227	7.00–8.00	QBT3	—	—	0.752	—
RE00-09-214	00-604228	0.00–1.00	FILL	—	—	—	0.62
RE00-09-215	00-604228	8.25–9.25	QBT3	—	—	0.523	—
RE00-09-216	00-604229	0.00–1.00	FILL	—	—	7.98	—
RE00-09-217	00-604229	1.00–2.00	QBT3	—	—	0.849	—
RE00-09-235	00-604238	0.00–1.00	FILL	—	0.052	—	—
RE00-09-236	00-604238	1.50–2.50	FILL	—	—	0.206	—
RE00-09-237	00-604238	4.00–5.00	FILL	0.264	—	8.22	—
RE00-09-246	00-604238	6.50–7.50	QBT3	—	—	0.354	—

Notes: Results are in pCi/g.
[a] BVs/FVs are from LANL 1998, 059730.
[b] FV applies to soil and tuff samples collected from 0–0.5 ft only.
[c] na = Not available.
[d] — = Not detected or not detected above FV.

Table 6.27-1
Samples Collected and Analyses Requested at SWMU 01-006(o)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-16627	00-604052	1.25–2.25	FILL	09-831	09-829	09-831	09-831	09-831	09-831	09-829	09-830	09-829	09-831	09-830	09-845	09-829
RE00-08-16629	00-604053	1.50–2.50	FILL	09-831	09-829	09-831	09-831	09-831	09-831	09-829	09-830	09-829	09-831	09-830	09-845	09-829
RE00-08-16631	00-604054	0.75–1.75	FILL	09-831	09-829	09-831	09-831	09-831	09-831	09-829	09-830	09-829	09-831	09-830	09-845	09-829
RE00-08-16633	00-604055	0.25–1.25	FILL	09-831	09-829	09-831	09-831	09-831	09-831	09-829	09-830	09-829	09-831	09-830	09-845	09-829
RE00-08-16634	00-604055	1.75–2.75	FILL	09-831	09-829	09-831	09-831	09-831	09-831	09-829	09-830	09-829	09-831	09-830	09-845	09-829
RE00-08-16635	00-604055	4.00–5.00	FILL	09-831	09-829	09-831	09-831	09-831	09-831	09-829	09-830	09-829	09-831	09-830	09-845	09-829

Note: Numbers in analyte columns are request numbers.

Table 6.27-2
Inorganic Chemicals above BVs at SWMU 01-006(o)

Sample ID	Location ID	Depth (ft)	Media	Cyanide (Total)	Lead	Mercury	Nitrate
SOIL Background Value[a]				**0.5**	**22.3**	**0.1**	**na**[n]
RE00-08-16627	00-604052	1.25–2.25	FILL	0.56 (UJ)	—[c]	—	0.28
RE00-08-16631	00-604054	0.75–1.75	FILL	0.57 (UJ)	—	—	—
RE00-08-16633	00-604055	0.25–1.25	FILL	—	—	—	0.093 (J)
RE00-08-16634	00-604055	1.75–2.75	FILL	0.58 (UJ)	26 (J+)	—	—
RE00-08-16635	00-604055	4.00–5.00	FILL	0.58 (UJ)	—	0.103	0.16 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.27-3
Organic Chemicals Detected at SWMU 01-006(o)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzyl Alcohol	Bis(2-ethylhexyl)phthalate	Chrysene	Fluoranthene	Phenanthrene	Pyrene
RE00-08-16627	00-604052	1.25–2.25	FILL	0.069 (J)	—*	—	—	—	—	—	—	—	—	—	—
RE00-08-16629	00-604053	1.50–2.50	FILL	0.028 (J)	0.032 (J)	—	—	—	—	—	—	—	—	—	—
RE00-08-16631	00-604054	0.75–1.75	FILL	—	—	—	—	—	—	—	0.24 (J)	—	—	—	—
RE00-08-16633	00-604055	0.25–1.25	FILL	—	—	—	—	—	—	0.042 (J)	—	—	—	—	—
RE00-08-16635	00-604055	4.00–5.00	FILL	0.47 (J)	—	0.051 (J)	0.053 (J)	0.062 (J)	0.048 (J)	—	—	0.061 (J)	0.13 (J)	0.066 (J)	0.11 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.27-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 01-006(o)

Sample ID	Location ID	Depth (ft)	Media	Plutonium-239/240	Strontium-90	Tritium
SOIL Background Value[a]				**0.054**[b]	**1.31**[b]	**na**[c]
RE00-08-16629	00-604053	1.50–2.50	FILL	—[d]	0.39	—
RE00-08-16633	00-604055	0.25–1.25	FILL	0.282	—	1.42
RE00-08-16635	00-604055	4.00–5.00	FILL	0.146	—	—

Notes: Results are in pCi/g.
[a] BVs/FVs are from LANL 1998, 059730.
[b] FV applies to soil samples collected from 0–0.5 ft only.
[c] na = Not available.
[d] — = Not detected or not detected above FV.

Table 6.28-1
Samples Collected and Analyses Requested at SWMU 01-007(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-16353	00-603900	1.25–2.25	QBT3	09-641	09-640	09-641	09-641	09-641	09-641	09-640	09-639	09-640	09-641	09-639	09-639	09-640
RE00-08-16354	00-603900	3.25–4.25	QBT3	09-641	09-640	09-641	09-641	09-641	09-641	09-640	09-639	09-640	09-641	09-639	09-639	09-640
RE00-08-16355	00-603901	17.50–19.00	QBT3	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874
RE00-08-16356	00-603901	20.00–21.00	QBT3	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874	09-874
RE00-09-218	00-604230	0.00–1.00	SOIL	09-398	09-397	09-398	09-398	09-398	09-398	09-397	09-396	09-397	09-398	09-396	09-396	09-397
RE00-09-219	00-604230	1.00–2.00	QBT3	09-398	09-397	09-398	09-398	09-398	09-398	09-397	09-396	09-397	09-398	09-396	09-396	09-397
RE00-09-220	00-604231	0.00–1.00	SED	09-373	09-372	09-373	09-373	09-373	09-373	09-372	09-371	09-372	09-373	09-371	09-371	09-372
RE00-09-221	00-604231	1.00–2.00	QBT3	09-373	09-372	09-373	09-373	09-373	09-373	09-372	09-371	09-372	09-373	09-371	09-371	09-372
RE00-09-222	00-604232	0.00–1.00	SED	09-373	09-372	09-373	09-373	09-373	09-373	09-372	09-371	09-372	09-373	09-371	09-371	09-372
RE00-09-223	00-604232	1.00–2.00	QBT3	09-373	09-372	09-373	09-373	09-373	09-373	09-372	09-371	09-372	09-373	09-371	09-371	09-372
RE00-09-224	00-604233	0.00–1.00	SED	09-373	09-372	09-373	09-373	09-373	09-373	09-372	09-371	09-372	09-373	09-371	09-371	09-372
RE00-09-225	00-604233	1.00–2.00	QBT3	09-373	09-372	09-373	09-373	09-373	09-373	09-372	09-371	09-372	09-373	09-371	09-371	09-372
RE00-09-226	00-604234	0.00–1.00	SED	09-373	09-372	09-373	09-373	09-373	09-373	09-372	09-371	09-372	09-373	09-371	09-371	09-372
RE00-09-227	00-604234	1.00–2.00	QBT3	09-373	09-372	09-373	09-373	09-373	09-373	09-372	09-371	09-372	09-373	09-371	09-371	09-372
RE00-09-228	00-604235	0.00–1.00	SED	09-373	09-372	09-373	09-373	09-373	09-373	09-372	09-371	09-372	09-373	09-371	09-371	09-372
RE00-09-229	00-604235	1.00–2.00	QBT1G	09-373	09-372	09-373	09-373	09-373	09-373	09-372	09-371	09-372	09-373	09-371	09-371	09-372
RE00-09-230	00-604236	0.00–1.00	SED	09-373	09-372	09-373	09-373	09-373	09-373	09-372	09-371	09-372	09-373	09-371	09-371	09-372
RE00-09-231	00-604236	1.00–2.00	QBT1G	09-373	09-372	09-373	09-373	09-373	09-373	09-372	09-371	09-372	09-373	09-371	09-371	09-372
RE00-09-238	00-604239	5.00–6.00	FILL	09-451	09-450	09-451	09-451	09-451	09-451	09-450	09-449	09-450	09-451	09-449	09-449	09-450
RE00-09-239	00-604239	8.00–9.00	FILL	09-877	09-876	09-877	09-877	09-877	09-877	09-876	09-875	09-876	09-877	09-875	09-875	09-876
RE00-09-240	00-604239	11.00–12.50	FILL	09-877	09-876	09-877	09-877	09-877	09-877	09-876	09-875	09-876	09-877	09-875	09-875	09-876
RE00-09-241	00-604239	13.50–15.00	QBT3	09-877	09-876	09-877	09-877	09-877	09-877	09-876	09-875	09-876	09-877	09-875	09-875	09-876
RE00-09-242	00-604240	5.00–6.50	FILL	09-451	09-450	09-451	09-451	09-451	09-451	09-450	09-449	09-450	09-451	09-449	09-449	09-450
RE00-09-243	00-604240	8.00–9.00	FILL	09-451	09-450	09-451	09-451	09-451	09-451	09-450	09-449	09-450	09-451	09-449	09-449	09-450
RE00-09-244	00-604240	11.00–12.00	FILL	09-451	09-450	09-451	09-451	09-451	09-451	09-450	09-449	09-450	09-451	09-449	09-449	09-450
RE00-09-245	00-604240	14.00–15.00	QBT3	09-451	09-450	09-451	09-451	09-451	09-451	09-450	09-449	09-450	09-451	09-449	09-449	09-450

Note: Numbers in analyte columns are request numbers.

Table 6.28-2
Inorganic Chemicals above BVs at SWMU 01-007(a)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Beryllium	Calcium	Chromium	Copper	Cyanide (Total)	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Thallium	Zinc
SOIL Background Value[a]				**29200**	**0.83**	**8.17**	**1.83**	**6120**	**19.3**	**14.7**	**0.5**	**22.3**	**671**	**0.1**	**15.4**	**na**[b]	**na**	**1.52**	**0.73**	**48.8**
QBT1G Background Value[a]				**3560**	**0.5**	**0.56**	**1.44**	**1900**	**2.6**	**3.96**	**0.5**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1.22**	**40**
QBT3 Background Value[a]				**7340**	**0.5**	**2.79**	**1.21**	**2200**	**7.14**	**4.66**	**0.5**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1.1**	**63.5**
SED Background Value[a]				**15400**	**0.83**	**3.98**	**1.31**	**4420**	**10.5**	**11.2**	**0.82**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**0.73**	**60.2**
RE00-08-16353	00-603900	1.25–2.25	QBT3	—[c]	—	—	—	—	10.3 (J+)	—	0.54 (U)	—	—	—	—	0.18 (J)	—	0.31 (J)	—	—
RE00-08-16354	00-603900	3.25–4.25	QBT3	—	0.54 (U)	—	—	—	25.8 (J+)	—	0.54 (U)	—	—	—	12.3	—	—	0.31 (J)	—	—
RE00-08-16355	00-603901	17.50–19.00	QBT3	—	—	—	—	—	—	—	0.54 (U)	—	—	—	—	2.5	0.0027 (J)	—	—	—
RE00-08-16356	00-603901	20.00–21.00	QBT3	—	—	—	—	—	—	—	0.53 (U)	—	—	—	—	3.8	—	—	—	—
RE00-09-218	00-604230	0.00–1.00	SOIL	—	—	—	—	—	—	—	0.51 (U)	—	—	0.11	39.5 (J)	0.27	—	—	—	—
RE00-09-219	00-604230	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.15 (J)	—	—	—	—
RE00-09-220	00-604231	0.00–1.00	SED	—	—	—	—	—	—	—	—	49.9	—	—	—	—	—	—	—	—
RE00-09-221	00-604231	1.00–2.00	QBT3	—	—	—	—	—	—	—	0.52 (U)	—	—	—	—	0.18 (J)	—	0.41 (J)	—	—
RE00-09-222	00-604232	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	69.1 (J)
RE00-09-223	00-604232	1.00–2.00	QBT3	—	—	—	—	—	9.1 (J)	—	0.52 (U)	—	—	—	—	—	—	0.52 (UJ)	—	—
RE00-09-224	00-604233	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	0.15 (J)	—	—	—	—
RE00-09-225	00-604233	1.00–2.00	QBT3	—	—	—	—	—	49.5 (J)	—	0.54 (U)	—	537	—	22.7 (J)	—	—	—	—	—
RE00-09-226	00-604234	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	0.27	—	0.31 (J)	—	—
RE00-09-227	00-604234	1.00–2.00	QBT3	—	—	—	—	—	10.2 (J)	—	0.54 (U)	—	—	—	—	—	—	0.34 (J)	—	—
RE00-09-228	00-604235	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	0.49	—	0.51 (UJ)	—	—
RE00-09-229	00-604235	1.00–2.00	QBT1G	6920 (J)	0.54 (U)	1 (U)	1.7 (J)	—	6.4 (J)	—	0.54 (U)	—	257 (J)	—	3.1 (J)	—	—	0.33 (J)	—	—
RE00-09-230	00-604236	0.00–1.00	SED	—	—	—	1.9 (J)	—	—	—	—	—	—	—	—	—	—	0.55 (U)	0.86 (U)	—
RE00-09-231	00-604236	1.00–2.00	QBT1G	9080 (J)	0.6 (U)	0.97 (U)	3 (J)	—	6.3 (J)	—	0.6 (U)	—	221 (J)	—	4 (J)	—	—	0.6 (U)	—	—
RE00-09-238	00-604239	5.00–6.00	FILL	—	—	—	—	—	—	—	—	24.2 (J-)	—	0.209 (J)	—	6.9	—	—	—	—
RE00-09-239	00-604239	8.00–9.00	FILL	—	0.97 (J)	—	—	8030	30.9 (J+)	—	—	63.6 (J+)	—	2.12	—	7.5	0.0082 (J)	—	—	55.5
RE00-09-240	00-604239	11.00–12.50	FILL	—	—	—	—	21000	74.7 (J+)	—	—	55.8 (J+)	—	—	—	9.1	0.0054 (J)	—	—	65.3
RE00-09-241	00-604239	13.50–15.00	QBT3	—	—	—	—	—	—	5.3	0.53 (U)	—	—	—	—	8.4	—	0.4 (J)	—	—
RE00-09-242	00-604240	5.00–6.50	FILL	—	—	—	—	—	—	—	0.58 (U)	—	—	0.527 (J)	—	0.19 (J)	—	—	—	—
RE00-09-243	00-604240	8.00–9.00	FILL	—	—	—	—	—	—	—	—	24 (J-)	—	0.129 (J)	—	0.55	—	—	—	—
RE00-09-244	00-604240	11.00–12.00	FILL	—	—	—	—	—	—	—	—	—	—	—	—	0.4	—	—	—	—
RE00-09-245	00-604240	14.00–15.00	QBT3	—	0.55 (U)	—	—	—	63.1 (J-)	—	—	—	—	—	29.5	0.17 (J)	—	0.55 (U)	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.28-3
Organic Chemicals Detected at SWMU 01-007(a)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthylene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(k)fluoranthene	Benzyl Alcohol	Bis(2-ethylhexyl)phthalate	Butylbenzene[tert-]
RE00-08-16355	00-603901	17.50–19.00	QBT3	—*	—	—	—	—	—	—	—	—	—	—	—
RE00-08-16356	00-603901	20.00–21.00	QBT3	—	—	—	—	—	0.0002 (J)	—	—	—	—	0.075 (J)	0.00015 (J)
RE00-09-218	00-604230	0.00–1.00	SOIL	—	—	—	—	0.055	—	—	—	—	—	0.45	—
RE00-09-219	00-604230	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-220	00-604231	0.00–1.00	SED	—	—	—	—	0.029 (J)	—	—	—	—	—	1.4	—
RE00-09-222	00-604232	0.00–1.00	SED	—	0.0044 (J)	—	—	0.017 (J)	—	—	—	—	—	—	—
RE00-09-224	00-604233	0.00–1.00	SED	—	0.0072 (J)	—	0.0083 (J)	0.015 (J)	—	—	—	—	—	—	—
RE00-09-225	00-604233	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	0.036 (J-)	1.6 (J-)	—
RE00-09-226	00-604234	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	1.2	—
RE00-09-227	00-604234	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.85	—
RE00-09-228	00-604235	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-229	00-604235	1.00–2.00	QBT1G	—	—	—	—	—	—	—	—	—	—	1.7	—
RE00-09-230	00-604236	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	0.14 (J)	—
RE00-09-231	00-604236	1.00–2.00	QBT1G	—	—	—	—	—	—	—	—	—	—	1.3	—
RE00-09-238	00-604239	5.00–6.00	FILL	—	—	—	—	0.0068 (J)	—	—	—	—	—	—	—
RE00-09-240	00-604239	11.00–12.50	FILL	—	—	—	—	0.042	—	—	—	—	—	0.2 (J)	—
RE00-09-242	00-604240	5.00–6.50	FILL	—	—	—	—	0.021 (J)	—	—	—	—	—	—	—
RE00-09-243	00-604240	8.00–9.00	FILL	—	—	—	—	0.0082 (J)	—	—	—	—	—	—	—
RE00-09-244	00-604240	11.00–12.00	FILL	0.047 (J)	—	0.16 (J)	—	0.0073 (J)	—	0.14 (J)	0.045 (J)	0.043 (J)	—	—	—
RE00-09-245	00-604240	14.00–15.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.28-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chlorotoluene[4-]	Chrysene	Di-n-butylphthalate	Fluoranthene	Isopropylbenzene	Isopropyltoluene[4-]	Methylene Chloride	Phenanthrene	Pyrene	Tetrachloroethene	Trichlorofluoromethane	Xylene (Total)
RE00-08-16355	00-603901	17.50–19.00	QBT3	—	—	—	—	0.00012 (J)	—	—	—	—	—	—	—
RE00-08-16356	00-603901	20.00–21.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-218	00-604230	0.00–1.00	SOIL	—	—	—	—	—	—	—	—	—	—	0.0012 (J+)	—
RE00-09-219	00-604230	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.0012 (J)	—
RE00-09-220	00-604231	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-222	00-604232	0.00–1.00	SED	—	—	—	—	—	0.0041 (J)	—	—	—	—	—	—
RE00-09-224	00-604233	0.00–1.00	SED	0.00022 (J)	—	—	—	—	—	—	—	—	0.00018 (J)	—	0.00034 (J)
RE00-09-225	00-604233	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-226	00-604234	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-227	00-604234	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-228	00-604235	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	0.00011 (J)	—	—
RE00-09-229	00-604235	1.00–2.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-230	00-604236	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-231	00-604236	1.00–2.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-238	00-604239	5.00–6.00	FILL	—	—	0.065 (J)	0.063 (J)	—	—	0.0065	0.32 (J)	0.088 (J)	—	—	—
RE00-09-240	00-604239	11.00–12.50	FILL	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-242	00-604240	5.00–6.50	FILL	—	—	—	—	—	—	0.0059	—	—	—	—	—
RE00-09-243	00-604240	8.00–9.00	FILL	—	—	—	—	—	—	0.0055 (J)	—	—	—	—	—
RE00-09-244	00-604240	11.00–12.00	FILL	—	0.18 (J)	—	0.36 (J)	—	—	0.0083	0.86	0.65	—	—	—
RE00-09-245	00-604240	14.00–15.00	QBT3	—	—	—	—	—	—	0.0058	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.28-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 01-007(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium
SOIL Background Value[a]				**0.013**[b]	**1.65**[b]	**0.023**[b]	**0.054**[b]	**na**[c]
QBT1G Background Value[a]				**na**	**na**	**na**	**na**	**na**
QBT3 Background Value[a]				**na**	**na**	**na**	**na**	**na**
SED Background Value[a]				**0.04**	**0.9**	**0.006**	**0.068**	**0.093**
RE00-08-16353	00-603900	1.25–2.25	QBT3	—[d]	—	0.112	0.272	—
RE00-09-218	00-604230	0.00–1.00	SOIL	0.187	0.323	—	6.34	—
RE00-09-219	00-604230	1.00–2.00	QBT3	—	—	—	0.221	—
RE00-09-220	00-604231	0.00–1.00	SED	1.05	—	—	190	—
RE00-09-221	00-604231	1.00–2.00	QBT3	0.125	—	—	20	—
RE00-09-222	00-604232	0.00–1.00	SED	0.164	—	—	10.8	—
RE00-09-223	00-604232	1.00–2.00	QBT3	—	—	—	6.07	—
RE00-09-224	00-604233	0.00–1.00	SED	0.633	—	0.141	38.2	—
RE00-09-225	00-604233	1.00–2.00	QBT3	0.121	—	0.063	7.62	—
RE00-09-226	00-604234	0.00–1.00	SED	—	—	0.053	2.01	—
RE00-09-227	00-604234	1.00–2.00	QBT3	—	—	—	0.101 (J)	—
RE00-09-228	00-604235	0.00–1.00	SED	—	—	—	5.82	—
RE00-09-229	00-604235	1.00–2.00	QBT1G	—	—	—	0.247 (J)	—
RE00-09-230	00-604236	0.00–1.00	SED	—	—	—	1.89	—
RE00-09-231	00-604236	1.00–2.00	QBT1G	—	—	—	0.426 (J)	—
RE00-09-238	00-604239	5.00–6.00	FILL	—	—	—	0.235	1.68
RE00-09-239	00-604239	8.00–9.00	FILL	0.189	—	—	10.4	2.08
RE00-09-240	00-604239	11.00–12.50	FILL	—	—	—	5.78	1.84
RE00-09-241	00-604239	13.50–15.00	QBT3	—	—	—	0.133	1.72
RE00-09-242	00-604240	5.00–6.50	FILL	—	—	—	0.531	—
RE00-09-243	00-604240	8.00–9.00	FILL	—	—	—	1.94	—
RE00-09-244	00-604240	11.00–12.00	FILL	0.197	—	—	11.3	—
RE00-09-245	00-604240	14.00–15.00	QBT3	—	—	—	0.17	—

Notes: Results are in pCi/g.

[a] BVs/FVs are from LANL 1998, 059730.

[b] FV applies to soil and tuff samples collected from 0–0.5 ft only and applies to sediment samples of all depth.

[c] na = Not available.

[d] — = Not detected or not detected above BV/FV.

Table 6.29-1
Samples Collected and Analyses Requested at SWMU 01-007(b)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-15764	00-603781	10.00–13.00	QBT3	09-880	09-879	09-880	09-880	09-880	09-880	09-879	09-878	09-879	09-880	09-878	09-878	09-879
RE00-08-15765	00-603781	13.00–15.00	QBT3	09-880	09-879	09-880	09-880	09-880	09-880	09-879	09-878	09-879	09-880	09-878	09-878	09-879
RE00-08-15729	00-603782	5.00–6.50	QBT3	09-880	09-879	09-880	09-880	09-880	09-880	09-879	09-878	09-879	09-880	09-878	09-878	09-879
RE00-08-15730	00-603782	7.50–9.00	QBT3	09-880	09-879	09-880	09-880	09-880	09-880	09-879	09-878	09-879	09-880	09-878	09-878	09-879
RE00-08-15735	00-603785	0.00–1.00	QBT3	09-121	09-120	09-121	09-121	09-121	09-121	09-120	09-119	09-120	09-121	09-119	09-119	09-120
RE00-08-15736	00-603785	1.00–2.00	QBT3	09-121	09-120	09-121	09-121	09-121	09-121	09-120	09-119	09-120	09-121	09-119	09-119	09-120
RE00-08-15737	00-603786	0.00–1.00	SOIL	09-121	09-120	09-121	09-121	09-121	09-121	09-120	09-119	09-120	09-121	09-119	09-119	09-120
RE00-08-15738	00-603786	1.00–2.00	QBT3	09-121	09-120	09-121	09-121	09-121	09-121	09-120	09-119	09-120	09-121	09-119	09-119	09-120
RE00-08-15739	00-603787	0.00–0.75	SED	09-78	09-77	09-78	09-78	09-78	09-78	09-77	09-76	09-77	09-78	09-76	09-76	09-77
RE00-08-15740	00-603787	1.25–2.25	QBT3	09-78	09-77	09-78	09-78	09-78	09-78	09-77	09-76	09-77	09-78	09-76	09-76	09-77
RE00-08-15741	00-603788	0.00–1.00	SED	09-78	09-77	09-78	09-78	09-78	09-78	09-77	09-76	09-77	09-78	09-76	09-76	09-77
RE00-08-15742	00-603788	1.50–2.50	QBT3	09-78	09-77	09-78	09-78	09-78	09-78	09-77	09-76	09-77	09-78	09-76	09-76	09-77
RE00-08-15743	00-603789	0.00–1.00	SED	09-78	09-77	09-78	09-78	09-78	09-78	09-77	09-76	09-77	09-78	09-76	09-76	09-77
RE00-08-15744	00-603789	2.00–3.00	QBT3	09-78	09-77	09-78	09-78	09-78	09-78	09-77	09-76	09-77	09-78	09-76	09-76	09-77
RE00-08-15745	00-603790	0.00–1.00	SED	09-92	09-91	09-92	09-92	09-92	09-92	09-91	09-90	09-91	09-92	09-90	09-90	09-91
RE00-08-15746	00-603790	1.00–2.25	QBT3	09-92	09-91	09-92	09-92	09-92	09-92	09-91	09-90	09-91	09-92	09-90	09-90	09-91
RE00-08-15747	00-603791	0.00–1.00	SED	09-78	09-77	09-78	09-78	09-78	09-78	09-77	09-76	09-77	09-78	09-76	09-76	09-77
RE00-08-15748	00-603791	1.00–2.00	QBT3	09-78	09-77	09-78	09-78	09-78	09-78	09-77	09-76	09-77	09-78	09-76	09-76	09-77
RE00-08-15749	00-603792	0.00–1.00	SED	09-78	09-77	09-78	09-78	09-78	09-78	09-77	09-76	09-77	09-78	09-76	09-76	09-77
RE00-08-15750	00-603792	1.75–2.75	QBT3	09-78	09-77	09-78	09-78	09-78	09-78	09-77	09-76	09-77	09-78	09-76	09-76	09-77
RE00-08-15751	00-603793	0.00–1.00	SED	09-78	09-77	09-78	09-78	09-78	09-78	09-77	09-76	09-77	09-78	09-76	09-76	09-77
RE00-08-15752	00-603793	1.00–2.00	QBT3	09-78	09-77	09-78	09-78	09-78	09-78	09-77	09-76	09-77	09-78	09-76	09-76	09-77
RE00-08-15753	00-603794	0.00–1.00	SED	09-92	09-91	09-92	09-92	09-92	09-92	09-91	09-90	09-91	09-92	09-90	09-90	09-91
RE00-08-15754	00-603794	1.00–2.50	QBT3	09-92	09-91	09-92	09-92	09-92	09-92	09-91	09-90	09-91	09-92	09-90	09-90	09-91
RE00-08-15756	00-603795	0.00–1.00	QBT3	09-92	09-91	09-92	09-92	09-92	09-92	09-91	09-90	09-91	09-92	09-90	09-90	09-91
RE00-08-15755	00-603795	1.00–2.00	QBT3	09-92	09-91	09-92	09-92	09-92	09-92	09-91	09-90	09-91	09-92	09-90	09-90	09-91
RE00-08-15757	00-603796	0.00–1.00	SED	09-78	09-77	09-78	09-78	09-78	09-78	09-77	09-76	09-77	09-78	09-76	09-76	09-77
RE00-08-15758	00-603796	1.00–2.00	QBT3	09-78	09-77	09-78	09-78	09-78	09-78	09-77	09-76	09-77	09-78	09-76	09-76	09-77
RE00-08-15759	00-603797	0.00–1.00	SED	09-92	09-91	09-92	09-92	09-92	09-92	09-91	09-90	09-91	09-92	09-90	09-90	09-91
RE00-08-15760	00-603797	2.25–3.25	QBT3	09-92	09-91	09-92	09-92	09-92	09-92	09-91	09-90	09-91	09-92	09-90	09-90	09-91
RE00-08-15761	00-603798	0.00–1.00	SED	09-92	09-91	09-92	09-92	09-92	09-92	09-91	09-90	09-91	09-92	09-90	09-90	09-91
RE00-08-15762	00-603798	2.75–3.75	QBT3	09-92	09-91	09-92	09-92	09-92	09-92	09-91	09-90	09-91	09-92	09-90	09-90	09-91

Note: Numbers in analyte columns are request numbers.

Table 6.29-2
Inorganic Chemicals above BVs at SWMU 01-007(b)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Calcium	Chromium	Copper	Cyanide (Total)	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium
QBT3 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**2200**	**7.14**	**4.66**	**0.5**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**na**[b]	**na**	**0.3**
SED Background Value[a]				**15400**	**0.83**	**3.98**	**127**	**1.31**	**4420**	**10.5**	**11.2**	**0.82**	**19.7**	**2370**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**
RE00-08-15764	00-603781	10.00–13.00	QBT3	—[c]	—	—	—	—	—	—	—	—	—	—	—	—	—	0.58	—	0.39 (J)
RE00-08-15765	00-603781	13.00–15.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.61	—	0.38 (J)
RE00-08-15729	00-603782	5.00–6.50	QBT3	8450 (J)	—	3.6 (J+)	2480	—	7860 (J)	7.4 (J)	9.6	—	13.2 (J+)	2180 (J)	—	—	7.8 (J)	0.088 (J)	—	1.6
RE00-08-15730	00-603782	7.50–9.00	QBT3	—	—	—	66.6	—	—	—	5.6	—	—	—	766	—	15.9	0.085 (J)	—	1.4 (U)
RE00-08-15735	00-603785	0.00–1.00	QBT3	—	—	—	—	—	—	—	5.1	0.53 (U)	16.4	—	—	0.351	—	—	—	—
RE00-08-15738	00-603786	1.00–2.00	QBT3	—	0.52 (UJ)	—	—	—	—	19	—	0.51 (U)	—	—	—	—	8.8	—	—	—
RE00-08-15739	00-603787	0.00–0.75	SED	—	—	—	—	—	—	—	—	—	22.7	—	—	0.206	—	—	—	0.52 (U)
RE00-08-15741	00-603788	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.67	—	—
RE00-08-15743	00-603789	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.3	—	0.41 (J)
RE00-08-15744	00-603789	2.00–3.00	QBT3	—	—	—	—	—	—	—	—	0.51 (UJ)	—	—	—	—	—	—	—	0.37 (J)
RE00-08-15745	00-603790	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	0.203 (J)	—	—	—	—
RE00-08-15746	00-603790	1.00–2.25	QBT3	—	—	—	—	—	—	—	—	0.51 (U)	—	—	—	—	—	—	—	—
RE00-08-15747	00-603791	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.44	—	—
RE00-08-15748	00-603791	1.00–2.00	QBT3	—	—	—	—	—	—	9.9	—	—	—	—	—	—	—	—	—	0.37 (J)
RE00-08-15749	00-603792	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.3	—	0.35 (J)
RE00-08-15750	00-603792	1.75–2.75	QBT3	—	—	—	—	—	—	23.7	—	—	—	—	—	—	11.9	0.94	0.0077	0.4 (J)
RE00-08-15751	00-603793	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.4	—	0.32 (J)
RE00-08-15752	00-603793	1.00–2.00	QBT3	—	—	—	—	—	—	8	—	—	—	—	—	—	—	—	—	0.41 (J)
RE00-08-15754	00-603794	1.00–2.50	QBT3	—	—	—	—	1.3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15756	00-603795	0.00–1.00	QBT3	—	0.52 (UJ)	—	—	—	—	—	—	0.52 (U)	—	—	—	—	—	—	—	—
RE00-08-15758	00-603796	1.00–2.00	QBT3	—	—	—	—	—	—	25.4 (J)	—	0.51 (UJ)	—	—	—	—	12.7 (J)	—	—	0.73
RE00-08-15759	00-603797	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.55 (U)
RE00-08-15760	00-603797	2.25–3.25	QBT3	—	—	—	—	—	—	—	—	0.53 (U)	—	—	—	—	—	—	—	0.96
RE00-08-15762	00-603798	2.75–3.75	QBT3	—	—	—	—	—	—	21.1	—	0.51 (U)	—	—	—	—	9.9	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.29-3
Organic Chemicals Detected at SWMU 01-007(b)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1260	Bis(2-ethylhexyl)phthalate	Chloromethane	Di-n-butylphthalate	Isopropylbenzene	Isopropyltoluene[4-]	Methylene Chloride	Toluene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]
RE00-08-15764	00-603781	10.00–13.00	QBT3	—*	—	0.00029 (J)	—	—	—	—	—	—	—
RE00-08-15729	00-603782	5.00–6.50	QBT3	0.049	—	—	—	0.00012 (J)	—	—	—	—	—
RE00-08-15730	00-603782	7.50–9.00	QBT3	—	0.47	—	—	—	—	—	—	0.00024 (J)	—
RE00-08-15735	00-603785	0.00–1.00	QBT3	0.087	—	—	0.048 (J)	—	—	—	—	—	—
RE00-08-15739	00-603787	0.00–0.75	SED	0.23	—	—	—	—	—	—	0.00061 (J)	—	—
RE00-08-15740	00-603787	1.25–2.25	QBT3	0.035	—	—	—	—	—	—	—	—	—
RE00-08-15741	00-603788	0.00–1.00	SED	—	—	—	—	—	—	—	0.00039 (J)	—	—
RE00-08-15743	00-603789	0.00–1.00	SED	—	0.054 (J)	—	—	—	—	—	—	—	—
RE00-08-15744	00-603789	2.00–3.00	QBT3	—	—	—	—	—	—	0.00073 (J)	—	—	—
RE00-08-15745	00-603790	0.00–1.00	SED	0.26	—	—	—	—	—	—	—	—	—
RE00-08-15746	00-603790	1.00–2.25	QBT3	0.024 (J)	—	—	—	—	—	—	—	—	—
RE00-08-15747	00-603791	0.00–1.00	SED	—	—	—	—	—	—	—	0.00037 (J)	—	—
RE00-08-15748	00-603791	1.00–2.00	QBT3	—	0.055 (J)	—	—	—	—	—	—	—	—
RE00-08-15750	00-603792	1.75–2.75	QBT3	—	—	—	—	—	0.00019 (J)	—	—	—	—
RE00-08-15752	00-603793	1.00–2.0	QBT3	—	—	—	0.036 (J)	—	—	—	—	—	—
RE00-08-15757	00-603796	0.00–1.00	SED	—	—	—	—	—	—	0.00094 (J+)	—	—	—
RE00-08-15759	00-603797	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	0.0004 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.29-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 01-007(b)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Uranium-234	Uranium-235/236	Uranium-238
QBT3 Background Value[a]				**na**[b]	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
SED Background Value[a]				**0.04**	**0.9**	**0.006**	**0.068**	**2.59**	**0.2**	**2.29**
SOIL Background Value[a]				**0.013**[c]	**1.65**[c]	**0.023**[c]	**0.054**[c]	**2.59**	**0.2**	**2.29**
RE00-08-15735	00-603785	0.00–1.00	QBT3	2.64	—[d]	—	242	5.1	0.265	4.28
RE00-08-15736	00-603785	1.00–2.00	QBT3	0.123	—	—	15.6	—	—	—
RE00-08-15737	00-603786	0.00–1.00	SOIL	—	0.321	—	3.5	—	—	—
RE00-08-15738	00-603786	1.00–2.00	QBT3	—	—	—	1.31 (J)	—	—	—
RE00-08-15739	00-603787	0.00–0.75	SED	0.62	—	0.102	52.6	—	—	—
RE00-08-15740	00-603787	1.25–2.25	QBT3	—	—	—	4.77	—	—	—
RE00-08-15741	00-603788	0.00–1.00	SED	—	—	—	3.96	—	—	—
RE00-08-15743	00-603789	0.00–1.00	SED	—	—	—	1.28	—	—	—
RE00-08-15744	00-603789	2.00–3.00	QBT3	—	—	—	0.993 (J)	—	—	—
RE00-08-15745	00-603790	0.00–1.00	SED	0.311	—	—	54.9	—	—	—
RE00-08-15746	00-603790	1.00–2.25	QBT3	—	—	—	7.75	—	—	—
RE00-08-15747	00-603791	0.00–1.00	SED	—	—	—	8.54	—	—	—
RE00-08-15748	00-603791	1.00–2.00	QBT3	—	—	—	6.35	—	—	—
RE00-08-15749	00-603792	0.00–1.00	SED	—	—	—	1.3 (J)	—	—	—
RE00-08-15750	00-603792	1.75–2.75	QBT3	—	—	—	0.49 (J)	—	—	—
RE00-08-15751	00-603793	0.00–1.00	SED	0.22	—	—	20.1	—	—	—
RE00-08-15752	00-603793	1.00–2.00	QBT3	—	—	—	0.596 (J)	—	—	—
RE00-08-15753	00-603794	0.00–1.00	SED	—	—	—	3.76	—	—	—
RE00-08-15759	00-603797	0.00–1.00	SED	0.24	—	—	9.07	—	—	—
RE00-08-15760	00-603797	2.25–3.25	QBT3	—	—	—	0.382	—	—	—
RE00-08-15761	00-603798	0.00–1.00	SED	—	—	—	0.471	—	—	—

Notes: Results are in pCi/g. Data qualifiers are presented in Appendix A.

[a] BVs/FVs are from LANL 1998, 059730.

[b] na = Not available.

[c] FV applies to soil and tuff samples collected from 0–0.5 ft only and applies to sediment samples of all depth.

[d] — = Not detected or not detected above BV/FV.

Table 6.30-1
Samples Collected and Analyses Requested at SWMU 01-007(c)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-16343	00-603895	3.25–4.25	QBT3	09-625	09-624	09-625	09-625	09-625	09-625	09-624	09-623	09-624	09-625	09-623	09-623	09-624
RE00-08-16344	00-603895	5.25–6.25	QBT3	09-625	09-624	09-625	09-625	09-625	09-625	09-624	09-623	09-624	09-625	09-623	09-623	09-624
RE00-08-16347	00-603897	5.50–7.00	QBT3	09-625	09-624	09-625	09-625	09-625	09-625	09-624	09-623	09-624	09-625	09-623	09-623	09-624
RE00-08-16348	00-603897	7.50–8.50	QBT3	09-625	09-624	09-625	09-625	09-625	09-625	09-624	09-623	09-624	09-625	09-623	09-623	09-624
RE00-08-16349	00-603898	1.25–2.25	QBT3	09-641	09-640	09-641	09-641	09-641	09-641	09-640	09-639	09-640	09-641	09-639	09-639	09-640
RE00-08-16350	00-603898	3.25–4.50	QBT3	09-641	09-640	09-641	09-641	09-641	09-641	09-640	09-639	09-640	09-641	09-639	09-639	09-640
RE00-08-16353	00-603900	1.25–2.25	QBT3	09-641	09-640	09-641	09-641	09-641	09-641	09-640	09-639	09-640	09-641	09-639	09-639	09-640
RE00-08-16354	00-603900	3.25–4.25	QBT3	09-641	09-640	09-641	09-641	09-641	09-641	09-640	09-639	09-640	09-641	09-639	09-639	09-640

Note: Numbers in analyte columns are request numbers.

Table 6.30-2
Inorganic Chemicals above BVs at SWMU 01-007(c)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Chromium	Cyanide (Total)	Lead	Nickel	Nitrate	Selenium
QBT3 Background Value[a]				**0.5**	**7.14**	**0.5**	**11.2**	**6.58**	**na**[b]	**0.3**
RE00-08-16343	00-603895	3.25–4.25	QBT3	—[c]	—	0.54 (U)	38.3 (J)	—	—	0.4 (J)
RE00-08-16344	00-603895	5.25–6.25	QBT3	0.53 (U)	28.8	0.53 (U)	13.4 (J)	13.1	—	0.36 (J)
RE00-08-16347	00-603897	5.50–7.00	QBT3	—	—	0.6 (U)	11.4 (J)	—	—	0.41 (J)
RE00-08-16348	00-603897	7.50–8.50	QBT3	—	8.9 (J)	0.57 (U)	18.4 (J)	6.8	—	0.36 (J)
RE00-08-16349	00-603898	1.25–2.25	QBT3	—	10.5 (J+)	—	—	—	—	0.35 (J)
RE00-08-16350	00-603898	3.25–4.50	QBT3	—	15.8 (J+)	0.55 (U)	—	8.8	0.16 (J)	—
RE00-08-16353	00-603900	1.25–2.25	QBT3	—	10.3 (J+)	0.54 (U)	—	—	0.18 (J)	0.31 (J)
RE00-08-16354	00-603900	3.25–4.25	QBT3	0.54 (U)	25.8 (J+)	0.54 (U)	—	12.3	—	0.31 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] BVs are from LANL 1998, 059730.
[b] na = Not available.
[c] — = Not detected or not detected above BV.

Table 6.30-3
Organic Chemicals Detected at SWMU 01-007(c)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1260	Benzene	Butylbenzene[n-]	Butylbenzene[sec-]	Chloroform	Isopropyltoluene[4-]	Styrene	Toluene	Vinyl Chloride	Xylene (Total)
RE00-08-16343	00-603895	3.25–4.25	QBT3	0.038	—*	—	—	—	—	—	—	—	—
RE00-08-16344	00-603895	5.25–6.25	QBT3	0.0077 (J)	—	—	—	—	—	—	—	—	—
RE00-08-16348	00-603897	7.50–8.50	QBT3	—	0.0002 (J)	0.00041 (J)	0.00019 (J)	0.00012 (J)	0.00023 (J)	—	0.00038 (J)	0.0017 (J)	0.0051 (J)
RE00-08-16350	00-603898	3.25–4.50	QBT3	—	—	—	—	—	—	0.00041 (J)	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.30-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 01-007(c)

Sample ID	Location ID	Depth (ft)	Media	Plutonium-238	Plutonium-239/240	Uranium-235/236
QBT3 Background Value[a]				**na**[b]	**na**	**0.09**
RE00-08-16343	00-603895	3.25–4.25	QBT3	—[c]	0.459	—
RE00-08-16347	00-603897	5.50–7.00	QBT3	—	0.234	—
RE00-08-16349	00-603898	1.25–2.25	QBT3	—	—	0.13
RE00-08-16353	00-603900	1.25–2.25	QBT3	0.112	0.272	—

Notes: Results are in pCi/g.
[a] BVs/FVs are from LANL 1998, 059730.
[b] na = Not available
[c] — = Not detected or not detected above BV/FV.

Table 6.31-1
Samples Collected and Analyses Requested at SWMU 01-007(d)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-09-268	00-604241	4.00–5.00	QBT3	09-606	09-605	09-606	09-606	09-606	09-606	09-605	09-604	09-605	09-606	09-604	09-604	09-605
RE00-09-269	00-604241	6.00–7.00	QBT3	09-606	09-605	09-606	09-606	09-606	09-606	09-605	09-604	09-605	09-606	09-604	09-604	09-605
RE00-09-270	00-604242	5.75–7.50	QBT3	09-606	09-605	09-606	09-606	09-606	09-606	09-605	09-604	09-605	09-606	09-604	09-604	09-605
RE00-09-271	00-604242	7.75–8.75	QBT3	09-606	09-605	09-606	09-606	09-606	09-606	09-605	09-604	09-605	09-606	09-604	09-604	09-605
RE00-09-272	00-604243	0.75–1.75	QBT3	09-606	09-605	09-606	09-606	09-606	09-606	09-605	09-604	09-605	09-606	09-604	09-604	09-605
RE00-09-273	00-604243	2.75–3.75	QBT3	09-606	09-605	09-606	09-606	09-606	09-606	09-605	09-604	09-605	09-606	09-604	09-604	09-605

Note: Numbers in analyte columns are request numbers.

Table 6.31-2
Inorganic Chemicals above BVs at SWMU 01-007(d)

Sample ID	Location ID	Depth (ft)	Media	Chromium	Copper	Lead	Manganese	Nickel	Nitrate	Selenium
QBT3 Background Value[a]				**7.14**	**4.66**	**11.2**	**482**	**6.58**	**na**[b]	**0.3**
RE00-09-268	00-604241	4.00–5.00	QBT3	32.5 (J)	—[c]	—	—	16.6	0.11 (J)	0.32 (J)
RE00-09-269	00-604241	6.00–7.00	QBT3	57.2 (J)	—	—	—	28	0.15 (J)	0.32 (J)
RE00-09-270	00-604242	5.75–7.50	QBT3	62.9 (J)	5.3	25.7	499	29.8	0.35	—
RE00-09-271	00-604242	7.75–8.75	QBT3	30.9 (J)	—	11.3	—	14.9	0.73	0.54 (U)
RE00-09-272	00-604243	0.75–1.75	QBT3	53.3 (J)	—	15.6	—	26	0.12 (J)	0.56 (U)
RE00-09-273	00-604243	2.75–3.75	QBT3	18.9 (J)	—	—	—	9.1	0.26	0.42 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.31-3
Organic Chemicals Detected at SWMU 01-007(d)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1260	Di-n-octylphthalate	Methylene Chloride	Trimethylbenzene[1,2,4-]
RE00-09-268	00-604241	4.00–5.00	QBT3	0.0043 (J)	0.43	—*	0.00044 (J)
RE00-09-269	00-604241	6.00–7.00	QBT3	—	—	0.0013 (J)	—
RE00-09-270	00-604242	5.75–7.50	QBT3	0.0061 (J)	—	0.0046 (J)	—
RE00-09-271	00-604242	7.75–8.75	QBT3	0.0031 (J)	—	0.0031 (J)	0.00057 (J)
RE00-09-272	00-604243	0.75–1.75	QBT3	0.025 (J)	—	0.0033 (J)	—
RE00-09-273	00-604243	2.75–3.75	QBT3	0.0037 (J)	—	—	0.00042 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.32-1
Samples Collected and Analyses Requested at SWMU 01-007(e)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-09-278	00-604244	4.75–5.75	QBT3	09-731	09-730	09-731	09-731	09-731	09-731	09-730	09-729	09-730	09-731	09-729	09-729	09-730
RE00-09-279	00-604244	6.75–7.75	QBT3	09-731	09-730	09-731	09-731	09-731	09-731	09-730	09-729	09-730	09-731	09-729	09-729	09-730
RE00-09-280	00-604245	0.75–2.25	QBT3	09-731	09-730	09-731	09-731	09-731	09-731	09-730	09-729	09-730	09-731	09-729	09-729	09-730
RE00-09-281	00-604245	2.75–3.75	QBT3	09-731	09-730	09-731	09-731	09-731	09-731	09-730	09-729	09-730	09-731	09-729	09-729	09-730

Note: Numbers in analyte columns are request numbers.

Table 6.32-2
Inorganic Chemicals above BVs at SWMU 01-007(e)

Sample ID	Location ID	Depth (ft)	Media	Barium	Calcium	Chromium	Copper	Cyanide (Total)	Lead	Nickel	Nitrate	Selenium	Silver
QBT3 Background Value[a]				**46**	**2200**	**7.14**	**4.66**	**0.5**	**11.2**	**6.58**	**na**[b]	**0.3**	**1**
RE00-09-278	00-604244	4.75–5.75	QBT3	46.4	—[c]	—	12.4 (J)	0.6 (UJ)	—	6.6 (J)	—	0.33 (J)	—
RE00-09-279	00-604244	6.75–7.75	QBT3	—	—	—	9.5 (J)	0.6 (UJ)	—	—	—	—	—
RE00-09-280	00-604245	0.75–2.25	QBT3	53.5 (J)	2580 (J)	8.6 (J)	9.9 (J)	0.56 (UJ)	11.5	7.3 (J)	1	—	3.1 (J-)
RE00-09-281	00-604245	2.75–3.75	QBT3	—	—	—	—	0.57 (UJ)	—	—	1.1	0.32 (J)	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] BVs are from LANL 1998, 059730.
[b] na = Not available.
[c] — = Not detected or not detected above BV.

Table 6.32-3
Organic Chemicals Detected at SWMU 01-007(e)

Sample ID	Location ID	Depth (ft)	Media	Anthracene	Aroclor-1254	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Ethylbenzene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene	Trichlorofluoromethane
RE00-09-278	00-604244	4.75–5.75	QBT3	0.045 (J)	0.029 (J)	0.11 (J)	0.099 (J)	0.094 (J)	0.057 (J)	0.09 (J)	0.13 (J)	—*	0.26 (J)	0.055 (J)	0.21 (J)	0.24 (J)	—
RE00-09-279	00-604244	6.75–7.75	QBT3	—	0.011 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-280	00-604245	0.75–2.25	QBT3	0.079 (J)	0.28 (J)	1.6	0.88	2	0.89	1.8	3	0.0001 (J)	1.5	0.78	0.2 (J)	1.6	0.00028 (J)
RE00-09-281	00-604245	2.75–3.75	QBT3	—	0.0064 (J)	—	—	—	—	—	—	—	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.33-1
Samples Collected and Analyses Requested at SWMU 01-007(j)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-09-286	00-604246	1.00–2.00	QBT3	09-721	09-721	09-721	09-721	09-721	09-721	09-721	09-721	09-721	09-721	09-721	09-721	09-721
RE00-09-287	00-604246	3.00–4.00	QBT3	09-721	09-721	09-721	09-721	09-721	09-721	09-721	09-721	09-721	09-721	09-721	09-721	09-721

Note: Numbers in analyte columns are request numbers.

Table 6.33-2
Inorganic Chemicals above BVs at SWMU 01-007(j)

Sample ID	Location ID	Depth (ft)	Media	Copper	Cyanide (Total)
QBT3 Background Value*				**4.66**	**0.5**
RE00-09-286	00-604246	1.00–2.00	QBT3	5.2	0.6 (UJ)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* BVs are from LANL 1998, 059730.

Table 6.33-3
Organic Chemicals Detected at SWMU 01-007(j)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1254	Bis(2-ethylhexyl)phthalate	Di-n-butylphthalate
RE00-09-286	00-604246	1.00–2.00	QBT3	0.67 (J)	0.085 (J)	0.05 (J)
RE00-09-287	00-604246	3.00–4.00	QBT3	0.6 (J)	—*	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.34-1
Samples Collected and Analyses Requested at AOC 01-007(k)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-16298	00-603879	1.00–2.00	QBT3	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543
RE00-08-16299	00-603879	3.00–4.00	QBT3	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543	09-543
RE00-08-16300	00-603880	2.00–3.00	QBT3	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466
RE00-08-16301	00-603880	4.00–5.00	QBT3	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466	09-466
RE00-08-16302	00-603881	1.25–2.25	QBT3	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531
RE00-08-16303	00-603881	3.25–4.25	QBT3	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531	09-531

Note: Numbers in analyte columns are request numbers.

Table 6.34-2
Inorganic Chemicals above BVs at AOC 01-007(k)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Calcium	Chromium	Copper	Cyanide (Total)	Lead	Nickel	Nitrate	Selenium
QBT3 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**2200**	**7.14**	**4.66**	**0.5**	**11.2**	**6.58**	**na**[b]	**0.3**
RE00-08-16298	00-603879	1.00–2.00	QBT3	—[c]	—	—	—	—	12.2 (J)	—	0.59 (U)	—	—	3.1	0.59 (U)
RE00-08-16299	00-603879	3.00–4.00	QBT3	—	—	—	—	—	21.3 (J)	—	—	—	10.3 (J)	—	0.36 (J)
RE00-08-16300	00-603880	2.00–3.00	QBT3	—	—	—	—	—	—	—	0.58 (UJ)	—	9.4 (J)	—	0.58 (U)
RE00-08-16301	00-603880	4.00–5.00	QBT3	—	0.57 (U)	—	—	—	—	—	—	—	9.1 (J)	—	0.57 (U)
RE00-08-16302	00-603881	1.25–2.25	QBT3	—	—	—	—	—	13.9 (J)	159 (J)	0.61 (U)	—	6.7 (J)	—	0.61 (UJ)
RE00-08-16303	00-603881	3.25–4.25	QBT3	9730 (J)	—	2.9	58.8 (J)	3000 (J)	14.2 (J)	—	0.62 (U)	13 (J)	8.5 (J)	—	0.32 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 6.34-3
Organic Chemicals Detected at AOC 01-007(k)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Methylene Chloride
RE00-08-16298	00-603879	1.00–2.00	QBT3	—*	0.02 (J)
RE00-08-16299	00-603879	3.00–4.00	QBT3	0.0064 (J)	0.026 (J)
RE00-08-16300	00-603880	2.00–3.00	QBT3	—	0.0032 (J)
RE00-08-16301	00-603880	4.00–5.00	QBT3	—	0.0025 (J)
RE00-08-16302	00-603881	1.25–2.25	QBT3	—	0.013 (J)
RE00-08-16303	00-603881	3.25–4.25	QBT3	—	0.015 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 6.34-4
Radionuclides Detected or Detected above BVs/FVs at AOC 01-007(k)

Sample ID	Location ID	Depth (ft)	Media	Uranium-235/236
QBT3 Background Value*				**0.09**
RE00-08-16300	00-603880	2.00–3.00	QBT3	0.16
RE00-08-16301	00-603880	4.00–5.00	QBT3	0.197

Note: Results are in pCi/g.
* BV is from LANL 1998, 059730.

Table 7.3-1
Samples Collected and Analyses Requested at SWMU 03-009(j)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-09-331	00-604252	1.75–3.00	QBT3	09-609	09-608	09-609	09-609	09-609	09-609	09-608	09-607	09-608	09-609	09-607	09-607	09-608
RE00-09-332	00-604252	4.00–5.00	QBT3	09-609	09-608	09-609	09-609	09-609	09-609	09-608	09-607	09-608	09-609	09-607	09-607	09-608
RE00-09-335	00-604253	1.50–2.50	QBT3	09-609	09-608	09-609	09-609	09-609	09-609	09-608	09-607	09-608	09-609	09-607	09-607	09-608
RE00-09-336	00-604253	3.50–4.50	QBT3	09-609	09-608	09-609	09-609	09-609	09-609	09-608	09-607	09-608	09-609	09-607	09-607	09-608

Note: Numbers in analyte columns are request numbers.

Table 7.3-2
Inorganic Chemicals above BVs at SWMU 03-009(j)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Calcium	Chromium	Cyanide (Total)	Lead	Magnesium	Nickel	Nitrate	Selenium
QBT3 Background Value[a]				**7340**	**2200**	**7.14**	**0.5**	**11.2**	**1690**	**6.58**	**na**[b]	**0.3**
RE00-09-331	00-604252	1.7500–3.00	QBT3	11700	3590	15.2 (J)	—[c]	—	—	11.1	0.2 (J)	0.63 (U)
RE00-09-332	00-604252	4.00–5.00	QBT3	7570	—	12.2 (J)	0.59 (U)	—	—	8.5	0.1 (J)	0.59 (U)
RE00-09-335	00-604253	1.50–2.50	QBT3	8430	2540 (J)	—	—	—	1740 (J)	8.4	0.15 (J)	0.62 (U)
RE00-09-336	00-604253	3.50–4.50	QBT3	8950	2480	9.5 (J)	0.58 (U)	16.4	1700	8.7	0.15 (J)	0.58 (U)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 7.4-1
Samples Collected and Analyses Requested at SWMUs 03-038(a,b)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-09-343	00-604254	2.00–3.00	QBT3	09-647	09-647	09-647	09-647	09-647	09-647	09-647	09-647	09-647	09-647	09-647	09-647	09-647
RE00-09-344	00-604254	4.00–5.00	QBT3	09-661	09-660	09-661	09-661	09-661	09-661	09-660	09-659	09-660	09-661	09-659	09-659	09-660
RE00-09-345	00-604254	6.00–7.00	QBT3	09-661	09-660	09-661	09-661	09-661	09-661	09-660	09-659	09-660	09-661	09-659	09-659	09-660
RE00-09-346	00-604255	1.50–2.50	QBT3	09-661	09-660	09-661	09-661	09-661	09-661	09-660	09-659	09-660	09-661	09-659	09-659	09-660
RE00-09-347	00-604255	3.50–4.50	QBT3	09-661	09-660	09-661	09-661	09-661	09-661	09-660	09-659	09-660	09-661	09-659	09-659	09-660
RE00-09-348	00-604255	5.50–6.50	QBT3	09-661	09-660	09-661	09-661	09-661	09-661	09-660	09-659	09-660	09-661	09-659	09-659	09-660
RE00-09-350	00-604256	2.00–3.00	QBT3	09-661	09-660	09-661	09-661	09-661	09-661	09-660	09-659	09-660	09-661	09-659	09-659	09-660
RE00-09-351	00-604256	4.00–5.00	QBT3	09-661	09-660	09-661	09-661	09-661	09-661	09-660	09-659	09-660	09-661	09-659	09-659	09-660
RE00-09-349	00-604256	7.25–8.25	QBT3	09-661	09-660	09-661	09-661	09-661	09-661	09-660	09-659	09-660	09-661	09-659	09-659	09-660
RE00-09-352	00-604257	1.00–2.00	QBT3	09-661	09-660	09-661	09-661	09-661	09-661	09-660	09-659	09-660	09-661	09-659	09-659	09-660
RE00-09-353	00-604257	3.00–4.00	QBT3	09-661	09-660	09-661	09-661	09-661	09-661	09-660	09-659	09-660	09-661	09-659	09-659	09-660
RE00-09-354	00-604257	5.00–6.00	QBT3	09-661	09-660	09-661	09-661	09-661	09-661	09-660	09-659	09-660	09-661	09-659	09-659	09-660
RE00-09-355	00-604258	2.25–3.25	QBT3	09-661	09-660	09-661	09-661	09-661	09-661	09-660	09-659	09-660	09-661	09-659	09-659	09-660
RE00-09-356	00-604258	4.25–5.25	QBT3	09-661	09-660	09-661	09-661	09-661	09-661	09-660	09-659	09-660	09-661	09-659	09-659	09-660
RE00-09-357	00-604258	6.25–7.25	QBT3	09-661	09-660	09-661	09-661	09-661	09-661	09-660	09-659	09-660	09-661	09-659	09-659	09-660
RE00-09-358	00-604259	2.25–3.25	QBT3	09-661	09-660	09-661	09-661	09-661	09-661	09-660	09-659	09-660	09-661	09-659	09-659	09-660
RE00-09-359	00-604259	4.25–5.25	QBT3	09-661	09-660	09-661	09-661	09-661	09-661	09-660	09-659	09-660	09-661	09-659	09-659	09-660
RE00-09-360	00-604259	6.25–7.25	QBT3	09-661	09-660	09-661	09-661	09-661	09-661	09-660	09-659	09-660	09-661	09-659	09-659	09-660

Note: Numbers in analyte columns are request numbers.

Table 7.4-2
Inorganic Chemicals above BVs at SWMUs 03-038(a,b)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Nickel	Nitrate	Perchlorate	Selenium
QBT3 Background Value[a]				**0.5**	**2.79**	**46**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**11.2**	**6.58**	**na**[b]	**na**	**0.3**
RE00-09-343	00-604254	2.00–3.00	QBT3	—[c]	—	90.3 (J-)	2420	25.4 (J-)	—	—	—	12.5 (J-)	14.1 (J)	—	0.0084 (J)	0.54 (U)
RE00-09-344	00-604254	4.00–5.00	QBT3	—	—	72.9	—	13.8	—	—	0.54 (U)	15.4 (J-)	8.7	0.22	0.036	—
RE00-09-345	00-604254	6.00–7.00	QBT3	—	3.1	74.8	2520	16.4	—	5.2	0.53 (U)	14.9 (J-)	10.1	2.7	0.039 (J)	—
RE00-09-346	00-604255	1.50–2.50	QBT3	0.59 (U)	—	—	—	—	—	—	—	—	—	5.4	—	—
RE00-09-347	00-604255	3.50–4.50	QBT3	—	—	—	—	—	—	—	0.6 (U)	—	—	5.9	—	—
RE00-09-348	00-604255	5.50–6.50	QBT3	—	—	46.7	—	7.7	—	—	0.59 (U)	—	—	4.3	—	—
RE00-09-350	00-604256	2.00–3.00	QBT3	0.59 (U)	—	—	—	—	—	—	—	—	—	8.3	—	—
RE00-09-351	00-604256	4.00–5.00	QBT3	—	—	—	—	—	—	—	—	—	—	8.6	—	—
RE00-09-349	00-604256	7.25–8.25	QBT3	—	—	64.4	4740	14.2	—	—	0.59 (U)	12.6 (J-)	8	4.2	—	—
RE00-09-352	00-604257	1.00–2.00	QBT3	0.58 (U)	—	—	—	—	—	—	0.58 (U)	—	—	3	—	—
RE00-09-353	00-604257	3.00–4.00	QBT3	0.59 (U)	—	—	—	—	—	—	0.59 (U)	—	—	6.1	—	—
RE00-09-354	00-604257	5.00–6.00	QBT3	—	—	95.8	2950	10.9	—	—	0.96	13.9 (J-)	—	2.7	—	—
RE00-09-355	00-604258	2.25–3.25	QBT3	0.58 (U)	—	—	—	—	—	—	—	—	—	1	—	—
RE00-09-356	00-604258	4.25–5.25	QBT3	0.6 (U)	—	—	—	—	—	—	0.6 (U)	—	—	4.3	—	—
RE00-09-357	00-604258	6.25–7.25	QBT3	—	—	73.8	2560	151	4.5	10.3	0.55 (U)	22 (J-)	71.6	1.9	—	0.55 (U)
RE00-09-358	00-604259	2.25–3.25	QBT3	—	—	—	—	—	—	7.6	0.53 (U)	—	—	0.22	—	—
RE00-09-359	00-604259	4.25–5.25	QBT3	—	—	78.6	—	19.4	—	—	0.54 (J)	16.3 (J-)	11.5	2.3	—	0.56 (U)
RE00-09-360	00-604259	6.25–7.25	QBT3	—	—	95.7	—	15.9	—	5.7	0.55 (U)	19 (J-)	10	1.4	—	0.55 (U)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 7.4-3
Organic Chemicals Detected at SWMUs 03-038(a,b)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1254	Aroclor-1260	Benzo(a)pyrene	Benzo(g,h,i)perylene	Bis(2-ethylhexyl)phthalate	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene	Toluene
RE00-09-343	00-604254	2.00–3.00	QBT3	0.0074 (J)	0.028 (J)	—*	—	0.066 (J)	—	—	—	—	—	—	—	—
RE00-09-344	00-604254	4.00–5.00	QBT3	0.0093 (J)	0.016 (J)	—	—	—	—	—	0.074 (J)	—	—	0.064 (J)	0.067 (J)	—
RE00-09-345	00-604254	6.00–7.00	QBT3	—	0.012 (J)	—	—	0.083 (J)	—	—	0.071 (J)	—	—	0.056 (J)	0.054 (J)	—
RE00-09-348	00-604255	5.50–6.50	QBT3	—	0.0077 (J)	—	—	—	—	—	—	—	—	—	—	—
RE00-09-351	00-604256	4.00–5.00	QBT3	0.013 (J)	0.0084 (J)	—	—	—	—	—	0.062 (J)	—	—	0.047 (J)	0.064 (J)	—
RE00-09-349	00-604256	7.25–8.25	QBT3	—	0.016 (J)	—	—	—	—	—	—	—	—	—	—	0.00057 (J)
RE00-09-352	00-604257	1.00–2.00	QBT3	—	—	—	0.32 (J)	—	—	0.17 (J)	—	—	0.2 (J)	—	—	—
RE00-09-354	00-604257	5.00–6.00	QBT3	—	0.016 (J)	—	—	—	—	—	—	—	—	—	—	—
RE00-09-357	00-604258	6.25–7.25	QBT3	—	0.02 (J)	—	—	—	—	—	0.042 (J)	—	—	—	0.062 (J)	—
RE00-09-358	00-604259	2.25–3.25	QBT3	—	0.014 (J)	—	—	—	—	—	—	—	—	—	—	—
RE00-09-359	00-604259	4.25–5.25	QBT3	0.039	0.026 (J)	—	—	—	—	—	0.051 (J)	0.0056 (J)	—	—	0.05 (J)	0.0006 (J)
RE00-09-360	00-604259	6.25–7.25	QBT3	0.022 (J)	0.022 (J)	0.039 (J)	—	—	0.043 (J)	—	0.079 (J)	—	—	0.05 (J)	0.071 (J)	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 7.5-1
Samples Collected and Analyses Requested at SWMU 03-055(c)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	HEXP	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE03-08-9417	03-603243	0.00–0.85	SED	08-357	08-356	08-357	08-357	08-355	08-357	08-357	08-356	08-354	08-356	08-357	08-354	08-354	08-356
RE03-08-9421	03-603243	0.85–1.64	SED	08-357	08-356	08-357	08-357	08-355	08-357	08-357	08-356	08-354	08-356	08-357	08-354	08-354	08-356
RE03-08-9425	03-603245	0.00–0.46	SED	08-357	08-356	08-357	08-357	08-355	08-357	08-357	08-356	08-354	08-356	08-357	08-354	08-354	08-356
RE03-08-9429	03-603245	0.46–1.05	SED	08-357	08-356	08-357	08-357	08-355	08-357	08-357	08-356	08-354	08-356	08-357	08-354	08-354	08-356
RE03-08-9430	03-603247	0.00–0.66	SED	08-357	08-356	08-357	08-357	08-355	08-357	08-357	08-356	08-354	08-356	08-357	08-354	08-354	08-356
RE03-08-9431	03-603248	0.00–1.08	SED	08-357	08-356	08-357	08-357	08-355	08-357	08-357	08-356	08-354	08-356	08-357	08-354	08-354	08-356
RE03-08-9432	03-603248	1.08–4.43	SED	08-357	08-356	08-357	08-357	08-355	08-357	08-357	08-356	08-354	08-356	08-357	08-354	08-354	08-356
RE03-08-9433	03-603250	0.00–0.66	SED	08-357	08-356	08-357	08-357	08-355	08-357	08-357	08-356	08-354	08-356	08-357	08-354	08-354	08-356
RE03-08-9434	03-603250	0.66–1.64	SED	08-357	08-356	08-357	08-357	08-355	08-357	08-357	08-356	08-354	08-356	08-357	08-354	08-354	08-356
RE03-08-9435	03-603250	1.64–2.30	SED	08-357	08-356	08-357	08-357	08-355	08-357	08-357	08-356	08-354	08-356	08-357	08-354	08-354	08-356
RE03-08-9436	03-603250	2.30–3.12	SED	08-357	08-356	08-357	08-357	08-355	08-357	08-357	08-356	08-354	08-356	08-357	08-354	08-354	08-356
RE03-08-9437	03-603254	0.00–1.15	SED	08-357	08-356	08-357	08-357	08-355	08-357	08-357	08-356	08-354	08-356	08-357	08-354	08-354	08-356
RE03-08-9438	03-603255	0.00–1.48	SED	08-357	08-356	08-357	08-357	08-355	08-357	08-357	08-356	08-354	08-356	08-357	08-354	08-354	08-356
RE03-08-9439	03-603256	0.00–0.66	SED	08-357	08-356	08-357	08-357	08-355	08-357	08-357	08-356	08-354	08-356	08-357	08-354	08-354	08-356
RE03-08-9440	03-603257	0.00–0.79	SED	08-357	08-356	08-357	08-357	08-355	08-357	08-357	08-356	08-354	08-356	08-357	08-354	08-354	08-356
RE03-08-9441	03-603258	0.00–1.48	SED	08-357	08-356	08-357	08-357	08-355	08-357	08-357	08-356	08-354	08-356	08-357	08-354	08-354	08-356
RE03-08-9442	03-603258	1.48–2.13	SED	08-357	08-356	08-357	08-357	08-355	08-357	08-357	08-356	08-354	08-356	08-357	08-354	08-354	08-356
RE03-08-9443	03-603258	2.13–3.12	SED	08-357	08-356	08-357	08-357	08-355	08-357	08-357	08-356	08-354	08-356	08-357	08-354	08-354	08-356
RE03-08-9444	03-603258	3.12–3.61	SED	08-357	08-356	08-357	08-357	08-355	08-357	08-357	08-356	08-354	08-356	08-357	08-354	08-354	08-356
RE03-08-9445	03-603258	3.61–4.00	SED	08-357	08-356	08-357	08-357	08-355	08-357	08-357	08-356	08-354	08-356	08-357	08-354	08-354	08-356

Note: Numbers in analyte columns are request numbers.

Table 7.5-2
Inorganic Chemicals above BVs at SWMU 03-055(c)

Sample ID	Location ID	Depth (ft)	Media	Arsenic	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Nitrate	Selenium	Vanadium	Zinc
SED Background Value[a]				**3.98**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**0.82**	**19.7**	**na[b]**	**0.3**	**19.7**	**60.2**
RE03-08-9417	03-603243	0.00–0.85	SED	—[c]	—	4440 (J)	—	—	—	1.94	—	1.22 (J+)	1.56 (U)	—	—
RE03-08-9421	03-603243	0.85–1.64	SED	—	—	—	—	—	—	2.79	21.7 (J)	1.17 (J+)	8.76 (U)	—	140 (J)
RE03-08-9425	03-603245	0.00–0.46	SED	—	—	—	—	—	—	—	—	1.06 (J-)	1.71 (U)	—	86.8 (J)
RE03-08-9429	03-603245	0.46–1.05	SED	—	—	—	—	—	—	—	—	—	1.82 (U)	—	98 (J)
RE03-08-9430	03-603247	0.00–0.66	SED	—	—	5670 (J)	—	—	—	—	—	1.59 (J+)	1.76 (U)	—	—
RE03-08-9431	03-603248	0.00–1.08	SED	—	—	—	10.6	—	—	—	25.6 (J)	1.57 (J+)	1.9 (U)	—	80.8 (J)
RE03-08-9432	03-603248	1.08–4.43	SED	—	—	—	—	—	—	—	70 (J)	—	1.76 (U)	—	102 (J)
RE03-08-9433	03-603250	0.00–0.66	SED	6.02	—	—	—	8.52	—	—	—	—	1.85 (U)	—	70.6 (J)
RE03-08-9434	03-603250	0.66–1.64	SED	—	—	—	11.1	—	11.6 (J)	—	—	—	1.73 (U)	—	117 (J)
RE03-08-9435	03-603250	1.64–2.30	SED	—	—	—	—	—	—	—	—	—	1.78 (U)	—	69.4 (J-)
RE03-08-9436	03-603250	2.30–3.12	SED	—	—	—	—	—	—	—	—	—	2.07 (U)	—	113 (J)
RE03-08-9437	03-603254	0.00–1.15	SED	—	—	—	—	—	—	—	—	—	2.17 (U)	—	130 (J)
RE03-08-9438	03-603255	0.00–1.48	SED	—	0.573 (U)	—	—	—	—	—	—	1.1 (J+)	1.13 (J)	24 (J)	—
RE03-08-9439	03-603256	0.00–0.66	SED	—	—	—	—	—	15.1 (J)	—	—	—	1.88 (U)	—	146 (J)
RE03-08-9440	03-603257	0.00–0.79	SED	—	—	—	—	—	—	—	—	—	0.642 (J)	—	—
RE03-08-9441	03-603258	0.00–1.48	SED	—	—	—	—	—	—	—	—	1.23 (J+)	1.81 (U)	—	276 (J)
RE03-08-9442	03-603258	1.48–2.13	SED	—	—	—	—	—	—	—	—	—	1.8 (U)	—	73.1 (J)
RE03-08-9443	03-603258	2.13–3.12	SED	—	—	—	—	—	—	—	36.1 (J)	—	1.69 (U)	—	—
RE03-08-9444	03-603258	3.12–3.61	SED	—	—	—	—	—	—	1.89	174 (J)	—	8.91 (U)	—	67 (J)
RE03-08-9445	03-603258	3.61–4.00	SED	—	—	—	—	—	—	—	50.3 (J)	—	1.92 (U)	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 7.5-3
Organic Chemicals Detected at SWMU 03-055(c)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butanone[2-]	Chrysene
RE03-08-9417	03-603243	0.00–0.85	SED	—*	—	0.0123 (J)	0.0036 (J-)	0.0034 (J)	0.037 (J)	—	—	—	—	—	0.184 (J)	—	0.041 (J)
RE03-08-9421	03-603243	0.85–1.64	SED	—	—	0.00975 (J)	0.0042 (J-)	0.0037 (J)	0.031 (J)	—	—	—	—	—	0.251 (J)	—	—
RE03-08-9425	03-603245	0.00–0.46	SED	—	—	0.00858 (J)	0.0034 (J-)	0.0033 (J-)	0.0209 (J)	—	—	—	—	—	0.16 (J)	—	—
RE03-08-9429	03-603245	0.46–1.05	SED	—	—	—	0.0028 (J-)	0.0026 (J-)	0.0186 (J)	—	—	—	—	—	0.143 (J)	—	—
RE03-08-9430	03-603247	0.00–0.66	SED	—	—	—	0.0016 (J-)	—	—	—	—	—	—	—	0.253 (J)	—	—
RE03-08-9431	03-603248	0.00–1.08	SED	—	—	0.0101 (J)	0.0025 (J-)	0.0026 (J-)	0.0306 (J)	—	—	—	—	—	0.481	—	0.0445
RE03-08-9432	03-603248	1.08–4.43	SED	0.0462	0.00648	0.0674	0.0143 (J-)	0.0159 (J-)	0.15	0.138	0.242	0.0869	—	—	0.187 (J)	—	0.169
RE03-08-9433	03-603250	0.00–0.66	SED	0.0423 (J)	—	0.0654	0.0019 (J-)	0.0016 (J-)	0.0865	0.075 (J)	0.077 (J)	—	0.0558 (J)	—	0.191 (J)	—	0.0869
RE03-08-9434	03-603250	0.66–1.64	SED	—	—	—	0.0025 (J-)	0.0023 (J)	—	—	—	—	—	—	0.316	—	—
RE03-08-9435	03-603250	1.64–2.30	SED	—	—	—	—	0.002 (J)	—	—	—	—	—	0.36 (J)	2.39	0.23	0.0217 (J)
RE03-08-9436	03-603250	2.30–3.12	SED	—	—	—	0.0046 (J-)	0.0039 (J)	—	—	—	—	—	—	—	—	—
RE03-08-9437	03-603254	0.00–1.15	SED	—	—	0.023 (J)	0.0064 (J-)	0.0063 (J-)	0.0654	—	0.0849	—	0.0648	—	0.332	0.00397 (J)	—
RE03-08-9439	03-603256	0.00–0.66	SED	—	—	0.00882 (J)	0.0062 (J-)	0.0055 (J-)	0.0316 (J)	—	—	—	—	—	0.413 (J)	—	0.036 (J)
RE03-08-9440	03-603257	0.00–0.79	SED	—	—	0.0113 (J)	0.0046 (J-)	0.0044 (J-)	0.0338 (J)	—	—	—	—	—	0.128 (J)	—	0.049
RE03-08-9441	03-603258	0.00–1.48	SED	0.151	—	0.252	0.0044 (J-)	0.0048 (J-)	0.278	0.29 (J)	0.497 (J)	—	—	—	0.176 (J)	0.00368 (J)	0.277
RE03-08-9442	03-603258	1.48–2.13	SED	—	—	0.0102 (J)	0.0024 (J-)	0.0024 (J-)	0.0237 (J)	—	—	—	—	—	0.161 (J)	0.00993 (J)	0.0249 (J)
RE03-08-9443	03-603258	2.13–3.12	SED	0.478	—	0.664	0.029 (J-)	0.0344 (J)	1.31 (J)	1.3 (J)	2.29 (J)	0.594 (J)	—	—	0.16 (J)	0.0113 (J)	1.41 (J)
RE03-08-9444	03-603258	3.12–3.61	SED	0.332	—	0.485	0.0347 (J-)	0.036 (J)	0.845 (J)	0.88 (J)	1.65 (J)	—	—	—	0.216 (J)	—	0.961 (J)
RE03-08-9445	03-603258	3.61–4.00	SED	0.177	—	0.265	0.0255 (J-)	0.0236 (J)	0.456 (J)	0.466 (J)	0.773 (J)	—	—	—	0.135 (J)	0.00531 (J)	0.505 (J)

Table 7.5-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenzofuran	Ethylbenzene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene	Trichlorofluoromethane	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
03-055(c)																
RE03-08-9417	03-603243	0.00–0.85	SED	—	—	0.0712	—	—	—	—	0.0426	0.114 (J)	—	—	—	—
RE03-08-9421	03-603243	0.85–1.64	SED	—	—	0.0527	—	—	—	—	0.0377 (J)	0.0868 (J)	—	—	—	—
RE03-08-9425	03-603245	0.00–0.46	SED	—	—	0.0468	—	—	—	—	0.0287 (J)	0.0481	—	—	—	—
RE03-08-9429	03-603245	0.46–1.05	SED	—	—	0.0296 (J)	—	—	—	—	0.0217 (J)	0.0455	—	0.0133 (J)	—	—
RE03-08-9430	03-603247	0.00–0.66	SED	—	—	—	—	—	—	—	—	0.0274 (J)	—	—	—	—
RE03-08-9431	03-603248	0.00–1.08	SED	—	—	0.0612	—	—	—	—	0.0367 (J)	0.0781	—	—	—	—
RE03-08-9432	03-603248	1.08–4.43	SED	—	0.000358 (J)	0.373	0.0445	0.0673	0.0123 (J)	0.0339 (J)	0.33	0.41	0.000506 (J)	—	—	—
RE03-08-9433	03-603250	0.00–0.66	SED	—	—	0.177	0.0394 (J)	—	0.0197 (J)	0.0668	0.196	0.239	—	—	—	—
RE03-08-9434	03-603250	0.66–1.64	SED	—	—	0.0313 (J)	—	—	—	—	0.021 (J)	0.0583	—	—	—	—
RE03-08-9435	03-603250	1.64–2.30	SED	—	—	0.031 (J)	—	—	—	—	0.0208 (J)	0.0377 (J)	0.000616 (J)	—	—	—
RE03-08-9436	03-603250	2.30–3.12	SED	—	—	0.0312 (J)	—	—	—	—	0.0185 (J)	0.0444 (J)	—	—	—	—
RE03-08-9437	03-603254	0.00–1.15	SED	—	—	0.157	—	—	—	—	0.0962	0.18	0.000469 (J)	—	—	—
RE03-08-9439	03-603256	0.00–0.66	SED	—	—	0.0473	—	—	—	—	0.0349 (J)	0.0812 (J)	—	—	—	—
RE03-08-9440	03-603257	0.00–0.79	SED	—	—	0.0818	—	—	—	—	0.0494	0.0861	—	—	—	—
RE03-08-9441	03-603258	0.00–1.48	SED	0.0879 (J)	—	0.701	0.147	0.15 (J)	0.0487	0.158	0.835	0.976	0.000552 (J)	—	—	—
RE03-08-9442	03-603258	1.48–2.13	SED	—	—	0.0493	—	—	—	—	0.0298 (J)	0.0617	—	—	—	—
RE03-08-9443	03-603258	2.13–3.12	SED	0.255 (J)	0.00161	2.63	0.437	0.606 (J)	0.175	0.515	2.78	4.08 (J)	—	—	—	0.000865 (J)
RE03-08-9444	03-603258	3.12–3.61	SED	0.183 (J)	0.00149	1.74	0.316	0.442 (J)	0.118	0.336	1.91	3.16 (J)	—	—	—	0.00309
RE03-08-9445	03-603258	3.61–4.00	SED	—	0.000774 (J)	0.94	0.16	—	0.053	0.15	0.997	1.46 (J)	—	—	0.0015	0.00148 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 7.5-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 03-055(c)

Sample ID	Location ID	Depth (ft)	Media	Plutonium-239/240	Tritium
SED Background Value[a]				**0.068**	**0.093**
RE03-08-9435	03-603250	1.64–2.30	SED	—[b]	0.116247
RE03-08-9444	03-603258	3.12–3.61	SED	0.0905	—

Note: Results are in pCi/g.
[a] BVs/FVs are from LANL 1998, 059730.
[b] — = Not detected or not detected above FV.

Table 8.3-1
Samples Collected and Analyses Requested at SWMU 32-001

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	DIOXIN_FURAN	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-15110	00-603575	1.5–2.5	SOIL	08-1972	08-1972	08-1971	08-1972	08-1972	08-1972	08-1972	08-1972	08-1972	08-1972	08-1972	08-1972	08-1972	08-1972
RE00-08-15111	00-603575	3.5–4.6	QBT3	08-1972	08-1972	08-1971	08-1972	08-1972	08-1972	08-1972	08-1972	08-1972	08-1972	08-1972	08-1972	08-1972	08-1972
RE00-08-15114	00-603576	1.50–2.50	SOIL	08-1987	08-1987	08-2001	08-1987	08-1987	08-1987	08-1987	08-1987	08-1987	08-1987	08-1987	08-1987	08-1987	08-1987
RE00-08-15115	00-603576	3.50–4.50	QBT3	08-1987	08-1987	08-2001	08-1987	08-1987	08-1987	08-1987	08-1987	08-1987	08-1987	08-1987	08-1987	08-1987	08-1987
RE00-08-15119	00-603577	1.50–2.50	SOIL	08-2013	08-2013	08-2012	08-2013	08-2013	08-2013	08-2013	08-2013	08-2013	08-2013	08-2013	08-2013	08-2013	08-2013
RE00-08-15131	00-603577	3.50–4.50	QBT3	08-2013	08-2013	08-2012	08-2013	08-2013	08-2013	08-2013	08-2013	08-2013	08-2013	08-2013	08-2013	08-2013	08-2013
RE00-08-15122	00-603578	1.50–2.50	QBT3	08-1999	08-1999	08-1998	08-1999	08-1999	08-1999	08-1999	08-1999	08-1999	08-1999	08-1999	08-1999	08-1999	08-1999
RE00-08-15123	00-603578	3.50–4.50	QBT3	08-1999	08-1999	08-1998	08-1999	08-1999	08-1999	08-1999	08-1999	08-1999	08-1999	08-1999	08-1999	08-1999	08-1999
RE00-08-15127	00-603579	1.50–3.00	FILL	08-2005	08-2005	08-2004	08-2005	08-2005	08-2005	08-2005	08-2005	08-2005	08-2005	08-2005	08-2005	08-2005	08-2005
RE00-08-15129	00-603579	3.60–4.60	QBT3	08-2005	08-2005	08-2004	08-2005	08-2005	08-2005	08-2005	08-2005	08-2005	08-2005	08-2005	08-2005	08-2005	08-2005
0132-96-0209	32-06446	0.17–0.83	FILL	—*	—	—	—	—	—	—	1895	—	—	—	1894	1894	—
0132-96-0210	32-06447	0.17–0.92	SOIL	—	—	—	—	—	—	—	1904	—	—	—	1903	1903	—

Note: Numbers in analyte columns are request numbers.
* — = Analysis not requested.

Table 8.3-2
Inorganic Chemicals above BVs at SWMU 32-001

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Sodium	Zinc
SOIL Background Value[a]				**0.83**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**22.3**	**671**	**0.1**	**15.4**	**na**[b]	**na**	**1.52**	**1**	**915**	**48.8**
QBT3 Background Value[a]				**0.5**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**2770**	**63.5**
RE00-08-15110	00-603575	1.5–2.5	SOIL	—[c]	—	—	—	—	—	—	2.3 (U)	—	—	—	—	3.8	—	—	—	—	—
RE00-08-15111	00-603575	3.5–4.6	QBT3	—	51.2 (J-)	—	2320 (J)	8.2 (J)	—	—	5.4 (U)	—	—	—	—	2.8	—	—	—	—	—
RE00-08-15114	00-603576	1.50–2.50	SOIL	—	—	—	—	—	—	—	0.57 (UJ)	—	—	—	—	2.6	—	—	—	—	—
RE00-08-15115	00-603576	3.50–4.50	QBT3	—	137 (J-)	—	6310	18.4 (J)	—	—	0.55 (UJ)	—	—	—	10.7	3.9	—	0.34 (U)	—	—	—
RE00-08-15119	00-603577	1.50–2.50	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	11.5	—	—	—	—	—
RE00-08-15131	00-603577	3.50–4.50	QBT3	—	73.2	—	—	18.8 (J)	—	—	0.54 (U)	—	—	—	11 (J)	11.9	—	—	—	—	—
RE00-08-15122	00-603578	1.50–2.50	QBT3	—	184 (J-)	—	9770	10.4 (J)	—	—	—	—	—	—	—	18.9	0.0036	0.54 (U)	—	—	—
RE00-08-15123	00-603578	3.50–4.50	QBT3	0.54 (U)	—	—	—	11.3 (J)	—	13.2	0.54 (UJ)	—	—	—	12.1	7.6	—	0.62 (U)	—	—	—
RE00-08-15127	00-603579	1.50–3.00	FILL	—	—	—	—	—	—	—	—	—	—	—	—	3.8	—	—	—	—	—
RE00-08-15129	00-603579	3.60–4.60	QBT3	—	—	—	—	16.9 (J)	—	—	0.54 (U)	—	—	—	8.9	2.5	—	—	—	—	—
0132-96-0209	32-06446	0.17–0.83	FILL	10.1 (U)	—	0.63 (U)	—	—	—	16.5	NA[b]	22.7	—	0.41	—	NA	NA	—	2 (UJ)	1130 (J)	79.3
0132-96-0210	32-06447	0.17–0.92	SOIL	9.5 (U)	—	0.59 (U)	—	—	12.4	—	NA	—	780	0.24	—	NA	NA	—	1.9 (U)	1150	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] BVs are from LANL 1998, 059730.
[b] na = Not available.
[c] — = Not detected or not detected above BV.

Table 8.3-3
Organic Chemicals Detected at SWMU 32-001

Sample ID	Location ID	Depth (ft)	Media	Acetone	Aroclor-1260	Bis(2-ethylhexyl)phthalate	Dichloroethene[cis-1,2-]	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]
RE00-08-15110	00-603575	1.5–2.5	SOIL	—[a]	0.07 (J)	—	NA	0.00000948	0.0000222	0.0000132	—	0.0000276	—
RE00-08-15111	00-603575	3.5–4.6	QBT3	—	—	—	NA	—	—	—	—	—	—
RE00-08-15114	00-603576	1.50–2.50	SOIL	—	0.51 (J)	—	NA	0.00000231 (J)	0.00000534	0.00000255	0.000000557 (J)	0.00000724	—
RE00-08-15115	00-603576	3.50–4.50	QBT3	0.0041 (J)	—	—	NA	—	—	—	—	—	—
RE00-08-15119	00-603577	1.50–2.50	SOIL	—	—	—	NA	0.00000267 (J)	0.00000572 (J)	—	—	0.00000427 (J)	—
RE00-08-15131	00-603577	3.50–4.50	QBT3	—	—	—	NA	—	0.000000938 (J)	—	—	—	—
RE00-08-15122	00-603578	1.50–2.50	QBT3	0.0065 (J)	—	—	NA	0.000000758 (J)	0.00000161	—	—	—	—
RE00-08-15123	00-603578	3.50–4.50	QBT3	0.0047 (J)	—	0.061 (J)	NA	—	—	—	—	—	—
RE00-08-15127	00-603579	1.50–3.00	FILL	—	0.078 (J)	—	NA	0.00000726	0.0000182	0.00000568 (J)	—	0.000012	0.000000316 (J)
RE00-08-15129	00-603579	3.60–4.60	QBT3	0.0056 (J)	—	0.16 (J)	NA	0.000000262 (J)	0.000000596	—	—	—	—
0132-96-0209	32-06446	0.17–0.83	FILL	—	NA[b]	—	0.01	NA	NA	NA	NA	NA	NA
0132-96-0210	32-06447	0.17–0.92	SOIL	—	NA	—	0.005 (J)	NA	NA	NA	NA	NA	NA

Table 8.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Methylene Chloride	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
RE00-08-15110	00-603575	1.5–2.5	SOIL	0.000000744 (J)	0.000000413 (J)	0.00000803	0.000000863 (J)	0.00000104 (J)	0.00000159 (J)	0.0000228	—	0.0000964	0.0000176
RE00-08-15111	00-603575	3.5–4.6	QBT3	—	—	—	—	—	—	—	—	0.00000131 (J)	0.000000224 (J)
RE00-08-15114	00-603576	1.50–2.50	SOIL	—	—	0.00000017	0.000000853 (J)	—	0.000000245 (J)	0.00000314 (J)	—	0.000029	0.0000077
RE00-08-15115	00-603576	3.50–4.50	QBT3	—	—	—	—	—	—	—	—	—	—
RE00-08-15119	00-603577	1.50–2.50	SOIL	—	—	0.000000353 (J)	—	0.0000000957 (J)	0.000000145 (J)	0.00000205 (J)	—	0.0000253 (J)	0.00000308 (J)
RE00-08-15131	00-603577	3.50–4.50	QBT3	—	—	—	—	—	—	—	—	0.00000699 (J)	—
RE00-08-15122	00-603578	1.50–2.50	QBT3	—	—	—	—	—	—	—	—	0.00000715	—
RE00-08-15123	00-603578	3.50–4.50	QBT3	—	—	—	—	—	—	—	—	0.000000575 (J)	—
RE00-08-15127	00-603579	1.50–3.00	FILL	0.000000409 (J)	0.000000551 (J)	0.00000681	0.000000768 (J)	0.000000595 (J)	0.000000716 (J)	0.00000681	0.0063	0.0000803	0.0000109
RE00-08-15129	00-603579	3.60–4.60	QBT3	—	—	—	—	—	—	—	0.0022 (J)	0.0000019 (J)	—
0132-96-0209	32-06446	0.17–0.83	FILL	NA	NA	NA	NA	NA	NA	NA	—	NA	NA
0132-96-0210	32-06447	0.17–0.92	SOIL	NA	NA	NA	NA	NA	NA	NA	0.005 (J)	NA	NA

Table 8.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofurans (Totals)	Tetrachloroethene	Trichloroethene
RE00-08-15110	00-603575	1.5–2.5	SOIL	—	0.00000283	0.000000152 (J)	0.00000325	0.0000618	—	—	0.0000198	—	—
RE00-08-15111	00-603575	3.5–4.6	QBT3	—	—	—	—	0.000000123	—	—	—	—	—
RE00-08-15114	00-603576	1.50–2.50	SOIL	—	0.000000155	—	0.000000188 (J)	0.00000119	—	—	—	—	—
RE00-08-15115	00-603576	3.50–4.50	QBT3	—	—	—	—	—	—	—	—	—	—
RE00-08-15119	00-603577	1.50–2.50	SOIL	—	—	—	—	0.00000152 (J)	—	—	0.000000162 (J)	0.00022 (J)	—
RE00-08-15131	00-603577	3.50–4.50	QBT3	—	—	—	—	0.000000221 (J)	—	—	—	—	—
RE00-08-15122	00-603578	1.50–2.50	QBT3	—	—	—	—	—	0.044 (J)	—	—	—	—
RE00-08-15123	00-603578	3.50–4.50	QBT3	—	—	—	—	—	—	—	—	—	—
RE00-08-15127	00-603579	1.50–3.00	FILL	0.000000233 (J)	0.00000348	0.000000225 (J)	0.000000502 (J)	0.0000046	—	0.00000163	0.00000452	—	—
RE00-08-15129	00-603579	3.60–4.60	QBT3	—	—	—	—	—	—	—	—	—	—
0132-96-0209	32-06446	0.17–0.83	FILL	NA	NA	NA	NA	NA	—	NA	NA	—	0.009
0132-96-0210	32-06447	0.17–0.92	SOIL	NA	NA	NA	NA	NA	—	NA	NA	—	0.006

Notes: Results are in mg/kg.

[a] — = Not detected.

[b] NA = Not analyzed.

Table 8.3-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 32-001

Sample ID	Location ID	Depth (ft)	Media	Plutonium-239/240	Strontium-90
SOIL Background Value[a]				**0.054**[b]	**1.31**[b]
RE00-08-15119	00-603577	1.50–2.50	SOIL	0.047	0.274

Note: Results are in pCi/g.

[a] BVs/FVs are from LANL 1998, 059730.

[b] FV applies to soil samples collected from 0–0.5 ft only.

Table 8.4-1
Samples Collected and Analyses Requested at SWMU 32-002(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins and Furans	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-15140	00-603580	2.00–3.00	QBT3	08-1997	08-1997	08-1996	08-1997	08-1997	08-1997	08-1997	08-1997	08-1997	08-1997	08-1997	08-1997	08-1997	08-1997
RE00-08-15141	00-603580	4.00–5.00	QBT3	08-1997	08-1997	08-1996	08-1997	08-1997	08-1997	08-1997	08-1997	08-1997	08-1997	08-1997	08-1997	08-1997	08-1997
RE00-08-15142	00-603581	3.00–4.00	QBT3	08-2009	08-2008	08-2006	08-2009	08-2009	08-2009	08-2009	08-2008	08-2007	08-2008	08-2009	08-2007	08-2007	08-2008
RE00-08-15143	00-603581	5.00–6.00	QBT3	08-2009	08-2008	08-2006	08-2009	08-2009	08-2009	08-2009	08-2008	08-2007	08-2008	08-2009	08-2007	08-2007	08-2008
RE00-08-15144	00-603582	4.00–5.00	QBT3	08-2009	08-2008	08-2006	08-2009	08-2009	08-2009	08-2009	08-2008	08-2007	08-2008	08-2009	08-2007	08-2007	08-2008
RE00-08-15145	00-603582	6.00–7.00	QBT3	08-2009	08-2008	08-2006	08-2009	08-2009	08-2009	08-2009	08-2008	08-2007	08-2008	08-2009	08-2007	08-2007	08-2008
RE00-08-15146	00-603583	6.50–7.50	QBT3	08-2009	08-2008	08-2006	08-2009	08-2009	08-2009	08-2009	08-2008	08-2007	08-2008	08-2009	08-2007	08-2007	08-2008
RE00-08-15147	00-603583	8.50–9.50	QBT3	08-2009	08-2008	08-2006	08-2009	08-2009	08-2009	08-2009	08-2008	08-2007	08-2008	08-2009	08-2007	08-2007	08-2008
RE00-08-15148	00-603584	1.50–2.50	QBT3	09-15	09-14	09-12	09-15	09-15	09-15	09-15	09-14	09-13	09-14	09-15	09-13	09-13	09-14
RE00-08-15149	00-603584	3.50–4.50	QBT3	09-15	09-14	09-12	09-15	09-15	09-15	09-15	09-14	09-13	09-14	09-15	09-13	09-13	09-14
RE00-08-15150	00-603585	0.00–1.00	QBT3	09-15	09-14	09-12	09-15	09-15	09-15	09-15	09-14	09-13	09-14	09-15	09-13	09-13	09-14
RE00-08-15151	00-603585	2.00–3.00	QBT3	09-15	09-14	09-12	09-15	09-15	09-15	09-15	09-14	09-13	09-14	09-15	09-13	09-13	09-14
RE00-08-15152	00-603586	0.00–1.00	QBT3	09-15	09-14	09-12	09-15	09-15	09-15	09-15	09-14	09-13	09-14	09-15	09-13	09-13	09-14
RE00-08-15153	00-603586	2.00–3.00	QBT3	09-15	09-14	09-12	09-15	09-15	09-15	09-15	09-14	09-13	09-14	09-15	09-13	09-13	09-14
RE00-08-15154	00-603587	0.00–1.00	QBT3	09-15	09-14	09-12	09-15	09-15	09-15	09-15	09-14	09-13	09-14	09-15	09-13	09-13	09-14
RE00-08-15155	00-603587	2.00–3.00	QBT3	09-15	09-14	09-12	09-15	09-15	09-15	09-15	09-14	09-13	09-14	09-15	09-13	09-13	09-14
RE00-08-15156	00-603588	0.00–1.00	QBT3	09-15	09-14	09-12	09-15	09-15	09-15	09-15	09-14	09-13	09-14	09-15	09-13	09-13	09-14
RE00-08-15157	00-603588	2.00–3.00	QBT3	09-15	09-14	09-12	09-15	09-15	09-15	09-15	09-14	09-13	09-14	09-15	09-13	09-13	09-14
RE00-08-15181	00-603596	1.25–2.25	QBT3	09-4	09-4	09-3	09-4	09-4	09-4	09-4	09-4	09-4	09-4	09-4	09-3	09-4	09-4
RE00-08-15182	00-603596	3.25–4.25	QBT3	09-4	09-4	09-3	09-4	09-4	09-4	09-4	09-4	09-4	09-4	09-4	09-3	09-4	09-4
0132-96-0751	32-06353	0.00–0.50	QBT3	—*	—	—	2069	—	2069	2069	2068	—	—	—	—	—	—
0132-96-0610	32-06367	4.00–4.17	QBT4	—	—	—	2019	2019	2019	2019	2018	—	—	—	2017	2017	—
0132-96-0601	32-06368	4.50–4.67	QBT4	—	—	—	2019	2019	2019	2019	2018	—	—	—	2017	2017	—
0132-96-0602	32-06369	4.50–4.67	QBT4	—	—	—	2019	2019	2019	2019	2018	—	—	—	2017	2017	—
0132-96-0604	32-06370	0.00–0.25	QBT4	—	—	—	2023	2023	2023	2023	2022	—	—	—	2021	2021	—
0132-96-0606	32-06371	0.00–0.25	QBT4	—	—	—	2023	2023	2023	2023	2022	—	—	—	2021	2021	—
0132-96-0607	32-06372	3.00–3.25	QBT4	—	—	—	2027	2027	2027	2027	2026	—	—	—	2025	2025	—
0132-96-0631	32-06373	0.00–0.50	SOIL	—	—	—	—	—	—	—	2026	—	—	—	—	—	—
0132-96-0608	32-06374	0.00–0.25	SOIL	—	—	—	2027	2027	2027	2027	2026	—	—	—	2025	2025	—
0132-96-0609	32-06375	0.00–0.50	SOIL	—	—	—	2038	2038	2038	2038	2037	—	—	—	2036	2036	—
0132-96-0616	32-06380	0.00–0.50	SOIL	—	—	—	2057	2057	2057	2057	2055	—	—	—	2054	2054	—

Note: Numbers in analyte columns are request numbers.
* — = Analysis not requested.

Table 8.4-2
Inorganic Chemicals above BVs at SWMU 32-002(a)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron
QBT3,4 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14500**
SOIL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**
RE00-08-15140	00-603580	2.00–3.00	QBT3	—[b]	—	—	—	—	—	—	10.5 (J)	—	—	0.54 (UJ)	—
RE00-08-15141	00-603580	4.00–5.00	QBT3	—	—	—	—	—	—	—	18.7 (J+)	—	—	0.54 (UJ)	—
RE00-08-15142	00-603581	3.00–4.00	QBT3	—	—	—	—	—	—	—	11.2 (J)	—	—	0.59 (U)	—
RE00-08-15143	00-603581	5.00–6.00	QBT3	—	—	—	—	—	—	—	18 (J+)	—	—	0.54 (U)	—
RE00-08-15144	00-603582	4.00–5.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.59 (U)	—
RE00-08-15145	00-603582	6.00–7.00	QBT3	—	—	—	138 (J)	—	—	—	9.2 (J)	—	4.7 (J)	0.58 (U)	—
RE00-08-15146	00-603583	6.50–7.50	QBT3	—	—	—	—	—	—	—	18.4 (J)	—	5.3 (J)	—	—
RE00-08-15147	00-603583	8.50–9.50	QBT3	—	—	—	—	—	—	—	29.4 (J+)	—	—	0.52 (U)	—
RE00-08-15148	00-603584	1.50–2.50	QBT3	—	0.51 (U)	—	—	—	—	—	—	—	—	—	—
RE00-08-15149	00-603584	3.50–4.50	QBT3	—	0.51 (U)	—	—	—	—	—	10.5 (J)	—	—	—	—
RE00-08-15150	00-603585	0.00–1.00	QBT3	—	0.88 (U)	—	55	—	—	—	—	—	—	—	—
RE00-08-15151	00-603585	2.00–3.00	QBT3	7450 (J)	—	—	73.1	1.4 (J)	—	3850 (J)	8.1 (U)	—	8.2 (J)	—	—
RE00-08-15152	00-603586	0.00–1.00	QBT3	—	0.54 (U)	—	53	—	—	2350 (J)	—	—	5.2 (J)	—	—
RE00-08-15153	00-603586	2.00–3.00	QBT3	—	0.51 (U)	—	—	—	—	—	10.8 (J)	—	—	—	—
RE00-08-15154	00-603587	0.00–1.00	QBT3	—	—	—	48.8	—	—	2700	—	—	6.6	—	—
RE00-08-15155	00-603587	2.00–3.00	QBT3	—	0.51 (U)	—	—	—	—	—	—	—	—	—	—
RE00-08-15156	00-603588	0.00–1.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15157	00-603588	2.00–3.00	QBT3	—	0.51 (U)	—	—	—	—	—	10.8 (J)	—	—	—	—
RE00-08-15181	00-603596	1.25–2.25	QBT3	—	—	—	55.1	—	—	—	10.3 (J)	—	5.6 (J)	—	—
RE00-08-15182	00-603596	3.25–4.25	QBT3	—	—	—	—	—	—	—	17.8 (J+)	—	—	—	—
0132-96-0751	32-06353	0.00–0.50	QBT3	—	—	—	54	—	—	4700	—	—	7.1	NA[c]	—
0132-96-0610	32-06367	4.00–4.17	QBT4	—	11 (U)	—	61	—	—	—	—	—	—	NA	—
0132-96-0601	32-06368	4.50–4.67	QBT4	—	11 (U)	—	59	—	—	—	—	—	—	NA	—
0132-96-0602	32-06369	4.50–4.67	QBT4	—	11 (U)	—	71	—	—	—	—	3.3	—	NA	—
0132-96-0604	32-06370	0.00–0.25	QBT4	—	5.43 (U)	—	54.2	—	—	—	—	—	—	NA	—
0132-96-0606	32-06371	0.00–0.25	QBT4	—	5.12 (U)	—	—	—	—	—	—	—	—	NA	—
0132-96-0607	32-06372	3.00–3.25	QBT4	8100	12 (UJ)	—	140	—	—	2400	—	4.8	7.1	NA	—
0132-96-0631	32-06373	0.00–0.50	SOIL	—	130 (UJ)	13	540	6.3 (U)	6.3 (U)	8900	150	—	29	NA	93000
0132-96-0608	32-06374	0.00–0.25	SOIL	—	12 (UJ)	—	—	—	0.6 (U)	—	—	—	—	NA	—
0132-96-0609	32-06375	0.00–0.50	SOIL	—	11	—	—	—	0.56 (U)	—	—	—	—	NA	—
0132-96-0616	32-06380	0.00–0.50	SOIL	—	6.8 (U)	—	—	—	0.9 (U)	—	—	—	—	NA	—

Table 8.4-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Sodium	Thallium	Zinc
QBT3,4 Background Value[a]				**11.2**	**1690**	**482**	**0.1**	**6.58**	**na[d]**	**na**	**0.3**	**1**	**2770**	**1.1**	**63.5**
SOIL Background Value[a]				**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**915**	**0.73**	**48.8**
RE00-08-15140	00-603580	2.00–3.00	QBT3	—	—	—	—	6.9 (J+)	0.89	—	0.54 (UJ)	—	—	—	—
RE00-08-15141	00-603580	4.00–5.00	QBT3	—	—	—	—	10.2	1.2	—	0.39 (U)	—	—	—	—
RE00-08-15142	00-603581	3.00–4.00	QBT3	—	—	—	—	8.6 (J)	2.5	—	—	—	—	—	—
RE00-08-15143	00-603581	5.00–6.00	QBT3	—	—	—	—	10 (J)	1.7	—	—	—	—	—	—
RE00-08-15144	00-603582	4.00–5.00	QBT3	—	—	—	—	—	4.2	—	—	—	—	—	—
RE00-08-15145	00-603582	6.00–7.00	QBT3	18.4 (J)	—	—	—	7.1 (J)	6.6	—	—	—	—	—	—
RE00-08-15146	00-603583	6.50–7.50	QBT3	—	—	—	—	11.3	0.32	—	—	—	—	—	—
RE00-08-15147	00-603583	8.50–9.50	QBT3	—	—	—	—	14.6 (J)	—	—	—	—	—	—	—
RE00-08-15148	00-603584	1.50–2.50	QBT3	—	—	—	—	—	—	0.0024	—	—	—	—	—
RE00-08-15149	00-603584	3.50–4.50	QBT3	—	—	—	—	7	0.14 (J)	0.0074	—	—	—	—	—
RE00-08-15150	00-603585	0.00–1.00	QBT3	21.6	—	—	0.169 (J)	—	0.57	—	—	—	—	—	102
RE00-08-15151	00-603585	2.00–3.00	QBT3	—	2140 (J)	—	—	11 (J)	—	0.0027	0.9	—	—	—	—
RE00-08-15152	00-603586	0.00–1.00	QBT3	14.5	—	—	0.114 (J)	6.6	0.71	0.0036	—	—	—	—	—
RE00-08-15153	00-603586	2.00–3.00	QBT3	—	—	—	—	8.4	—	0.0072	—	—	—	—	—
RE00-08-15154	00-603587	0.00–1.00	QBT3	22.1	—	—	0.316 (J)	—	3.2	—	—	—	—	—	—
RE00-08-15155	00-603587	2.00–3.00	QBT3	—	—	—	—	—	0.43	0.0027	0.51 (U)	—	—	—	—
RE00-08-15156	00-603588	0.00–1.00	QBT3	25.6	—	—	0.241 (J)	—	0.89	0.0031	—	—	—	—	—
RE00-08-15157	00-603588	2.00–3.00	QBT3	—	—	—	—	7.6	0.15 (J)	0.0024	0.34 (J)	—	—	—	—
RE00-08-15181	00-603596	1.25–2.25	QBT3	13.6	—	—	0.546 (J)	6.9 (J)	0.16 (J)	—	0.34 (J)	—	—	—	—
RE00-08-15182	00-603596	3.25–4.25	QBT3	—	—	—	—	9 (J+)	0.13 (J)	—	—	—	—	—	—
0132-96-0751	32-06353	0.00–0.50	QBT3	43 (J-)	—	830	0.17	—	NA	NA	1	2 (U)	—	1.3	—
0132-96-0610	32-06367	4.00–4.17	QBT4	17	—	—	0.22 (UJ)	—	NA	NA	—	2.2 (U)	—	—	—
0132-96-0601	32-06368	4.50–4.67	QBT4	26	—	—	0.23 (UJ)	—	NA	NA	—	2.3 (U)	—	—	—
0132-96-0602	32-06369	4.50–4.67	QBT4	110	—	—	0.11 (UJ)	—	NA	NA	—	2.2 (U)	—	—	—
0132-96-0604	32-06370	0.00–0.25	QBT4	19	—	—	—	—	NA	NA	—	—	—	—	—
0132-96-0606	32-06371	0.00–0.25	QBT4	—	—	—	—	—	NA	NA	—	—	—	—	—
0132-96-0607	32-06372	3.00–3.25	QBT4	26	—	—	0.12 (U)	—	NA	NA	—	2.4 (U)	4900	—	—
0132-96-0631	32-06373	0.00–0.50	SOIL	530	—	—	43	21	NA	NA	—	43	12000	—	240
0132-96-0608	32-06374	0.00–0.25	SOIL	24	—	—	1.2	—	NA	NA	—	2.4 (U)	1400	—	69
0132-96-0609	32-06375	0.00–0.50	SOIL	65 (J-)	—	—	0.11 (U)	—	NA	NA	—	2.2 (U)	3500	1.4 (U)	49
0132-96-0616	32-06380	0.00–0.50	SOIL	—	—	—	—	—	NA	NA	—	1.7 (U)	3210	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] BVs are from LANL 1998, 059730.
[b] — = Not detected or not detected above BV.
[c] NA = Not analyzed.
[d] na = Not available.

Table 8.4-3
Organic Chemicals Detected at SWMU 32-002(a)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Carbazole	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Dichlorodifluoromethane	Fluoranthene
RE00-08-15140	00-603580	2.00–3.00	QBT3	—[a]	0.0032 (J)	—	—	—	—	—	—	—	0.21 (J)	—	NA[b]	—	—	—	—	—
RE00-08-15141	00-603580	4.00–5.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	—
RE00-08-15142	00-603581	3.00–4.00	QBT3	—	0.0053 (J)	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	—
RE00-08-15143	00-603581	5.00–6.00	QBT3	—	0.0031 (J)	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	—
RE00-08-15144	00-603582	4.00–5.00	QBT3	—	—	—	0.042	—	—	—	—	—	—	—	NA	—	—	—	—	—
RE00-08-15145	00-603582	6.00–7.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	—
RE00-08-15146	00-603583	6.50–7.50	QBT3	—	0.0027 (J)	—	0.099	—	—	—	—	—	0.056 (J)	—	NA	—	—	—	—	—
RE00-08-15147	00-603583	8.50–9.50	QBT3	—	—	—	—	—	—	—	—	—	0.34	—	NA	—	—	—	—	—
RE00-08-15148	00-603584	1.50–2.50	QBT3	—	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	—
RE00-08-15149	00-603584	3.50–4.50	QBT3	—	—	—	—	—	—	—	—	—	—	0.055 (J)	NA	—	—	—	—	—
RE00-08-15150	00-603585	0.00–1.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	0.036 (J)
RE00-08-15151	00-603585	2.00–3.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	—
RE00-08-15152	00-603586	0.00–1.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	—
RE00-08-15153	00-603586	2.00–3.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	—
RE00-08-15154	00-603587	0.00–1.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	NA	0.042 (J)	—	—	—	0.074 (J)
RE00-08-15155	00-603587	2.00–3.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.034 (J)	NA	—	—	—	—	—
RE00-08-15156	00-603588	0.00–1.00	QBT3	—	—	—	—	—	—	—	—	—	—	0.038 (J)	NA	—	—	—	—	—
RE00-08-15157	00-603588	2.00–3.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	—
RE00-08-15181	00-603596	1.25–2.25	QBT3	—	—	—	—	—	—	—	—	—	0.12 (J)	—	NA	—	—	—	—	—
RE00-08-15182	00-603596	3.25–4.25	QBT3	—	—	—	—	—	—	—	—	—	0.44	—	NA	—	—	—	—	—
0132-96-0610	32-06367	4.00–4.17	QBT4	—	—	0.064 (J)	NA	0.68	0.52	0.81	0.2 (J)	0.31 (J)	—	—	0.049 (J)	0.77	0.073 (J)	—	—	1.1
0132-96-0601	32-06368	4.50–4.67	QBT4	—	—	—	NA	0.17 (J)	0.14 (J)	0.2 (J)	0.074 (J)	0.075 (J)	—	—	0.06 (J)	0.19 (J)	—	—	—	0.36 (J)
0132-96-0602	32-06369	4.50–4.67	QBT4	—	—	0.11 (J)	NA	0.34 (J)	0.27 (J)	0.4	0.079 (J)	0.17 (J)	—	—	0.085 (J)	0.36 (J)	—	—	—	0.61
0132-96-0604	32-06370	0.00–0.25	QBT4	—	—	—	NA	0.053 (J)	—	0.07 (J)	—	—	—	—	—	0.065 (J)	—	—	—	0.097 (J)
0132-96-0606	32-06371	0.00–0.25	QBT4	0.3 (J)	—	1.5	NA	4.2	3.5	5.5	0.83	2.4	—	—	0.99	3.8	0.39 (J)	0.17 (J)	—	6.1
0132-96-0607	32-06372	3.00–3.25	QBT4	—	0.033 (J+)	—	NA	0.25	0.2	0.2	—	—	—	—	NA	0.29	—	—	NA	0.45
0132-96-0608	32-06374	0.00–0.25	SOIL	—	—	—	NA	—	0.35	0.33	1.2	0.28	—	—	NA	0.34	—	—	—	0.2
0132-96-0609	32-06375	0.00–0.50	SOIL	—	0.022 (J+)	—	NA	—	—	—	—	—	—	—	NA	—	—	—	—	0.4
0132-96-0616	32-06380	0.00–0.50	SOIL	—	—	0.081 (J)	NA	0.73	0.58	0.59	0.33 (J)	0.58	—	—	NA	0.81	—	—	0.001 (J)	1.3

Table 8.4-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]
RE00-08-15140	00-603580	2.00–3.00	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15141	00-603580	4.00–5.00	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15142	00-603581	3.00–4.00	QBT3	—	0.000000862 (J)	0.00000202	—	—	—	—	—	—	—	—
RE00-08-15143	00-603581	5.00–6.00	QBT3	—	0.000000566 (J)	0.00000129	—	—	—	—	—	—	—	—
RE00-08-15144	00-603582	4.00–5.00	QBT3	—	0.000000999 (J)	0.00000261	—	—	0.00000122 (J)	—	—	—	—	0.00000016 (J)
RE00-08-15145	00-603582	6.00–7.00	QBT3	—	0.000000543 (J)	0.00000124	—	—	—	—	—	—	—	0.000000148 (J)
RE00-08-15146	00-603583	6.50–7.50	QBT3	—	0.0000377	0.0000792	0.00001 (J)	0.000000877 (J)	0.0000337	0.000000407 (J)	0.00000122 (J)	0.00000096 (J)	0.00000694	0.00000062 (J)
RE00-08-15147	00-603583	8.50–9.50	QBT3	—	0.0000241	0.0000407	0.00000764 (J)	0.00000051 (J)	0.0000209	—	0.00000084 (J)	0.000000741 (J)	0.00000477	0.000000329 (J)
RE00-08-15148	00-603584	1.50–2.50	QBT3	—	—	0.000000532	—	—	—	—	—	—	—	—
RE00-08-15149	00-603584	3.50–4.50	QBT3	—	0.000000555 (J)	0.00000125	—	—	—	—	—	—	—	—
RE00-08-15150	00-603585	0.00–1.00	QBT3	—	0.000126	0.000255	0.0000428	0.00000168 (J)	0.000125	0.00000129 (J)	0.00000435	0.0000025	0.0000248	0.00000106 (J)
RE00-08-15151	00-603585	2.00–3.00	QBT3	—	0.00000333	0.00000625	0.000000885 (J)	—	0.00000262	—	—	—	0.000000139	—
RE00-08-15152	00-603586	0.00–1.00	QBT3	—	0.0000127	0.0000304	0.00000411	—	0.00000993	—	0.000000496 (J)	—	0.00000306	0.000000196 (J)
RE00-08-15153	00-603586	2.00–3.00	QBT3	—	—	0.00000026	—	—	—	—	—	—	—	—
RE00-08-15154	00-603587	0.00–1.00	QBT3	—	0.000038	0.0000857	0.0000104	0.000000476 (J)	0.0000253	0.000000552 (J)	0.00000135 (J)	0.000000924 (J)	0.000011	0.000000497 (J)
RE00-08-15155	00-603587	2.00–3.00	QBT3	—	—	0.000000289	—	—	—	—	—	—	—	—
RE00-08-15156	00-603588	0.00–1.00	QBT3	—	0.0000348	0.0000719	0.0000115	0.000000352 (J)	0.0000273	0.000000388 (J)	0.00000131 (J)	0.000000797 (J)	0.00000896	0.000000342 (J)
RE00-08-15157	00-603588	2.00–3.00	QBT3	—	0.00000478	0.00000944	0.00000199 (J)	—	0.00000496	—	0.000000191 (J)	—	0.0000011	—
RE00-08-15181	00-603596	1.25–2.25	QBT3	—	0.000084	0.000163	0.0000238 (J)	0.0000012 (J)	0.0000749	0.000000763 (J)	0.00000222 (J)	0.00000167 (J)	0.0000127	0.000000569 (J)
RE00-08-15182	00-603596	3.25–4.25	QBT3	—	0.0000283	0.0000585	0.00000757 (J)	0.000000472 (J)	0.0000269	—	0.000000718 (J)	0.00000045 (J)	0.00000368	—
0132-96-0610	32-06367	4.00–4.17	QBT4	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0132-96-0601	32-06368	4.50–4.67	QBT4	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0132-96-0602	32-06369	4.50–4.67	QBT4	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0132-96-0604	32-06370	0.00–0.25	QBT4	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0132-96-0606	32-06371	0.00–0.25	QBT4	0.38 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0132-96-0607	32-06372	3.00–3.25	QBT4	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0132-96-0608	32-06374	0.00–0.25	SOIL	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0132-96-0609	32-06375	0.00–0.50	SOIL	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0132-96-0616	32-06380	0.00–0.50	SOIL	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 8.4-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]
RE00-08-15140	00-603580	2.00–3.00	QBT3	—	—	—	—	—	—	0.00000075 (J)	—	—	—	—
RE00-08-15141	00-603580	4.00–5.00	QBT3	—	—	—	—	—	—	0.000000588 (J)	—	—	—	—
RE00-08-15142	00-603581	3.00–4.00	QBT3	—	—	—	—	0.0059	—	0.00000739	0.00000086 (J)	—	—	—
RE00-08-15143	00-603581	5.00–6.00	QBT3	—	—	—	—	0.0074	—	0.00000437 (J)	0.000000398 (J)	—	—	—
RE00-08-15144	00-603582	4.00–5.00	QBT3	—	—	0.000000545 (J)	—	0.0078	—	0.00000817	0.00000128 (J)	—	—	—
RE00-08-15145	00-603582	6.00–7.00	QBT3	—	—	—	—	0.0062	—	0.00000421 (J)	0.000000689 (J)	—	—	—
RE00-08-15146	00-603583	6.50–7.50	QBT3	—	0.000000432 (J)	0.0000101	—	0.0099	—	0.000337	0.0000386	0.000000283 (J)	0.000000605	—
RE00-08-15147	00-603583	8.50–9.50	QBT3	—	0.000000381 (J)	0.00000739	—	0.0049 (J)	—	0.000202	0.0000204	0.000000183 (J)	0.000000183	—
RE00-08-15148	00-603584	1.50–2.50	QBT3	—	—	—	—	—	—	0.00000289 (J)	—	—	—	—
RE00-08-15149	00-603584	3.50–4.50	QBT3	—	—	—	—	—	—	0.00000387 (J)	—	—	—	—
RE00-08-15150	00-603585	0.00–1.00	QBT3	0.000000921 (J)	0.0000013 (J)	0.0000313	—	0.0077	—	0.000985 (J)	0.000177	0.000000625 (J)	0.00000118	0.000000201 (J)
RE00-08-15151	00-603585	2.00–3.00	QBT3	—	—	0.000000361	—	—	—	0.0000252 (J)	0.00000325 (J)	—	—	—
RE00-08-15152	00-603586	0.00–1.00	QBT3	—	0.000000268 (J)	0.00000386	—	—	—	0.000101 (J)	0.00000929	—	—	—
RE00-08-15153	00-603586	2.00–3.00	QBT3	—	—	—	—	—	—	0.00000148 (J)	—	—	—	—
RE00-08-15154	00-603587	0.00–1.00	QBT3	0.00000046 (J)	0.000000631 (J)	0.0000112	—	—	—	0.000291 (J)	0.0000211	—	0.000000808	0.000000157 (J)
RE00-08-15155	00-603587	2.00–3.00	QBT3	—	—	—	—	—	—	0.0000017 (J)	—	—	—	—
RE00-08-15156	00-603588	0.00–1.00	QBT3	0.00000036 (J)	0.000000544 (J)	0.0000105	—	0.0063	—	0.000253 (J)	0.0000259	—	—	—
RE00-08-15157	00-603588	2.00–3.00	QBT3	—	—	0.00000121	—	—	—	0.0000362 (J)	0.00000618	—	—	—
RE00-08-15181	00-603596	1.25–2.25	QBT3	—	0.000000584 (J)	0.0000167	—	—	—	0.00067	0.0000804	—	0.000000174	—
RE00-08-15182	00-603596	3.25–4.25	QBT3	—	—	0.00000486 (J)	—	—	—	0.000235	0.0000306	—	—	—
0132-96-0610	32-06367	4.00–4.17	QBT4	NA	NA	NA	0.23 (J)	—	—	NA	NA	NA	NA	NA
0132-96-0601	32-06368	4.50–4.67	QBT4	NA	NA	NA	0.076 (J)	—	—	NA	NA	NA	NA	NA
0132-96-0602	32-06369	4.50–4.67	QBT4	NA	NA	NA	0.091 (J)	0.003 (J)	—	NA	NA	NA	NA	NA
0132-96-0604	32-06370	0.00–0.25	QBT4	NA	NA	NA	—	—	—	NA	NA	NA	NA	NA
0132-96-0606	32-06371	0.00–0.25	QBT4	NA	NA	NA	1	—	0.082 (J)	NA	NA	NA	NA	NA
0132-96-0607	32-06372	3.00–3.25	QBT4	NA	NA	NA	—	—	—	NA	NA	NA	NA	NA
0132-96-0608	32-06374	0.00–0.25	SOIL	NA	NA	NA	0.64	—	—	NA	NA	NA	NA	NA
0132-96-0609	32-06375	0.00–0.50	SOIL	NA	NA	NA	—	—	—	NA	NA	NA	NA	NA
0132-96-0616	32-06380	0.00–0.50	SOIL	NA	NA	NA	0.29 (J)	—	—	NA	NA	NA	NA	NA

Table 8.4-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Trichlorofluoromethane
RE00-08-15140	00-603580	2.00–3.00	QBT3	—	—	—	—	—	—	—	—
RE00-08-15141	00-603580	4.00–5.00	QBT3	—	—	—	—	—	—	—	—
RE00-08-15142	00-603581	3.00–4.00	QBT3	—	—	—	—	—	—	—	—
RE00-08-15143	00-603581	5.00–6.00	QBT3	—	—	—	—	—	—	—	—
RE00-08-15144	00-603582	4.00–5.00	QBT3	—	0.000000186	—	—	—	—	—	—
RE00-08-15145	00-603582	6.00–7.00	QBT3	—	—	—	—	—	—	—	—
RE00-08-15146	00-603583	6.50–7.50	QBT3	0.000000265 (J)	0.00000303	—	—	—	—	0.000000433	—
RE00-08-15147	00-603583	8.50–9.50	QBT3	—	0.00000147	—	—	—	—	0.000000221	—
RE00-08-15148	00-603584	1.50–2.50	QBT3	—	—	—	—	—	—	—	—
RE00-08-15149	00-603584	3.50–4.50	QBT3	—	—	—	—	—	—	—	—
RE00-08-15150	00-603585	0.00–1.00	QBT3	0.000000853 (J)	0.0000106	—	—	0.000000136	0.00000049 (J)	0.00000228	—
RE00-08-15151	00-603585	2.00–3.00	QBT3	—	—	—	—	—	—	—	—
RE00-08-15152	00-603586	0.00–1.00	QBT3	—	—	—	—	—	—	0.00000021	—
RE00-08-15153	00-603586	2.00–3.00	QBT3	—	—	—	—	—	—	—	—
RE00-08-15154	00-603587	0.00–1.00	QBT3	0.000000461 (J)	0.00000603	0.041 (J)	0.059 (J)	0.000000143	0.000000595	0.00000225	—
RE00-08-15155	00-603587	2.00–3.00	QBT3	—	—	—	—	—	—	—	—
RE00-08-15156	00-603588	0.00–1.00	QBT3	0.000000443 (J)	0.00000498	—	—	—	—	0.00000143	—
RE00-08-15157	00-603588	2.00–3.00	QBT3	—	0.000000406	—	—	—	—	—	—
RE00-08-15181	00-603596	1.25–2.25	QBT3	0.000000226 (J)	0.00000286	—	—	0.000000403	—	—	—
RE00-08-15182	00-603596	3.25–4.25	QBT3	—	0.000000398	—	—	—	—	—	—
0132-96-0610	32-06367	4.00–4.17	QBT4	NA	NA	0.17 (J)	0.79	NA	NA	NA	—
0132-96-0601	32-06368	4.50–4.67	QBT4	NA	NA	0.11 (J)	0.26 (J)	NA	NA	NA	—
0132-96-0602	32-06369	4.50–4.67	QBT4	NA	NA	0.31 (J)	0.47	NA	NA	NA	0.006
0132-96-0604	32-06370	0.00–0.25	QBT4	NA	NA	0.047 (J)	0.071 (J)	NA	NA	NA	—
0132-96-0606	32-06371	0.00–0.25	QBT4	NA	NA	3.7	6.6	NA	NA	NA	—
0132-96-0607	32-06372	3.00–3.25	QBT4	NA	NA	—	0.3	NA	NA	NA	—
0132-96-0608	32-06374	0.00–0.25	SOIL	NA	NA	—	—	NA	NA	NA	—
0132-96-0609	32-06375	0.00–0.50	SOIL	NA	NA	—	0.22	NA	NA	NA	—
0132-96-0616	32-06380	0.00–0.50	SOIL	NA	NA	0.28 (J)	1	NA	NA	NA	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] — = Not detected.
[b] NA = Not analyzed.

Table 8.4-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 32-002(a)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-235/236
QBT3,4 Background Value[a]				**na**[b]	**na**	**na**	**na**	**0.09**
SOIL Background Value[a]				**1.65**[c]	**0.023**[c]	**0.054**[c]	**na**	**0.2**
RE00-08-15150	00-603585	0.00–1.00	QBT3	0.246	—[d]	—	—	—
RE00-08-15152	00-603586	0.00–1.00	QBT3	—	—	0.409	—	—
RE00-08-15154	00-603587	0.00–1.00	QBT3	0.405	—	—	—	—
RE00-08-15156	00-603588	0.00–1.00	QBT3	0.217	—	—	—	—
0132-96-0751	32-06353	0.00–0.50	QBT3	1.7	—	0.091	NA	—
0132-96-0602	32-06369	4.50–4.67	QBT4	—	—	0.681	—	—
0132-96-0604	32-06370	0.00–0.25	QBT4	—	—	0.027	—	—
0132-96-0606	32-06371	0.00–0.25	QBT4	—	—	2.7	—	—
0132-96-0607	32-06372	3.00–3.25	QBT4	—	—	—	—	0.126
0132-96-0608	32-06374	0.00–0.25	SOIL	—	0.079	0.109	—	—
0132-96-0609	32-06375	0.00–0.50	SOIL	—	—	—	0.0998875	—

Notes: Results are in pCi/g.
[a] BVs/FVs are from LANL 1998, 059730.
[b] na = Not available.
[c] FV applies to soil and tuff samples collected from 0–0.5 ft only.
[d] — = Not detected or not detected above FV.

Table 8.5-1
Samples Collected and Analyses Requested at SWMU 32-002(b)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins and Furans	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-15167	00-603589	3.50–4.50	QBT3	08-2011	08-2011	08-2010	08-2011	08-2011	08-2011	08-2011	08-2011	08-2011	08-2011	08-2011	08-2011	08-2011	08-2011
RE00-08-15168	00-603589	5.50–6.50	QBT3	08-2011	08-2011	08-2010	08-2011	08-2011	08-2011	08-2011	08-2011	08-2011	08-2011	08-2011	08-2011	08-2011	08-2011
RE00-08-15169	00-603590	5.50–6.50	QBT3	08-2026	08-2025	08-2027	08-2026	08-2026	08-2026	08-2026	08-2025	08-2028	08-2025	08-2026	08-2028	08-2028	08-2025
RE00-08-15170	00-603590	7.50–8.50	QBT3	08-2026	08-2025	08-2027	08-2026	08-2026	08-2026	08-2026	08-2025	08-2028	08-2025	08-2026	08-2028	08-2028	08-2025
RE00-08-15171	00-603591	5.50–6.50	QBT3	08-2026	08-2025	08-2027	08-2026	08-2026	08-2026	08-2026	08-2025	08-2028	08-2025	08-2026	08-2028	08-2028	08-2025
RE00-08-15172	00-603591	7.50–8.50	QBT3	08-2026	08-2025	08-2027	08-2026	08-2026	08-2026	08-2026	08-2025	08-2028	08-2025	08-2026	08-2028	08-2028	08-2025
RE00-08-15173	00-603592	3.50–4.50	QBT3	08-2026	08-2025	08-2027	08-2026	08-2026	08-2026	08-2026	08-2025	08-2028	08-2025	08-2026	08-2028	08-2028	08-2025
RE00-08-15174	00-603592	5.50–6.50	QBT3	08-2026	08-2025	08-2027	08-2026	08-2026	08-2026	08-2026	08-2025	08-2028	08-2025	08-2026	08-2028	08-2028	08-2025
RE00-08-15175	00-603593	0.00–1.00	QBT3	09-37	09-36	09-34	09-37	09-37	09-37	09-37	09-36	09-35	09-37	09-36	09-34	09-37	09-37
RE00-08-15176	00-603593	2.00–3.00	QBT3	09-37	09-36	09-34	09-37	09-37	09-37	09-37	09-36	09-35	09-37	09-36	09-34	09-37	09-37
RE00-08-15177	00-603594	3.50–4.50	QBT3	08-2026	08-2025	08-2027	08-2026	08-2026	08-2026	08-2026	08-2025	08-2028	08-2026	08-2025	08-2027	08-2026	08-2026
RE00-08-15178	00-603594	6.50–7.50	QBT3	08-2026	08-2025	08-2027	08-2026	08-2026	08-2026	08-2026	08-2025	08-2028	08-2026	08-2025	08-2027	08-2026	08-2026
RE00-08-15179	00-603595	1.20–2.20	QBT3	08-2026	08-2025	08-2027	08-2026	08-2026	08-2026	08-2026	08-2025	08-2028	08-2026	08-2025	08-2027	08-2026	08-2026
RE00-08-15180	00-603595	3.20–4.20	QBT3	08-2026	08-2025	08-2027	08-2026	08-2026	08-2026	08-2026	08-2025	08-2028	08-2026	08-2025	08-2027	08-2026	08-2026
RE00-08-15181	00-603596	1.25–2.25	QBT3	09-4	09-4	09-3	09-4	09-4	09-4	09-4	09-4	09-4	09-4	09-4	09-3	09-4	09-4
RE00-08-15182	00-603596	3.25–4.25	QBT3	09-4	09-4	09-3	09-4	09-4	09-4	09-4	09-4	09-4	09-4	09-4	09-3	09-4	09-4
RE00-08-15183	00-603597	0.75–1.75	QBT3	09-37	09-36	09-34	09-37	09-37	09-37	09-37	09-36	09-35	09-37	09-36	09-34	09-37	09-37
RE00-08-15184	00-603597	2.75–3.75	QBT3	09-37	09-36	09-34	09-37	09-37	09-37	09-37	09-36	09-35	09-37	09-36	09-34	09-37	09-37
RE00-08-15185	00-603598	1.25–2.25	QBT3	09-37	09-36	09-34	09-37	09-37	09-37	09-37	09-36	09-35	09-37	09-36	09-34	09-37	09-37
RE00-08-15186	00-603598	3.25–4.25	QBT3	09-37	09-36	09-34	09-37	09-37	09-37	09-37	09-36	09-35	09-37	09-36	09-34	09-37	09-37
RE00-08-15187	00-603599	0.00–0.50	SOIL	09-37	09-36	09-34	09-37	09-37	09-37	09-37	09-36	09-35	09-37	09-36	09-34	09-37	09-37
RE00-08-15188	00-603599	2.50–3.50	QBT2	09-37	09-36	09-34	09-37	09-37	09-37	09-37	09-36	09-35	09-37	09-36	09-34	09-37	09-37
0132-96-0325	32-06312	0.00–0.50	SOIL	1922	—*	—	—	1922	1922	1922	1921	—	—	—	1920	—	—
0132-96-0326	32-06312	0.50–1.00	QBT3	1922	—	—	—	1922	1922	1922	1921	—	—	—	1920	—	—
0132-96-0323	32-06313	0.00–0.50	SOIL	1922	—	—	—	1922	1922	1922	1921	—	—	—	1920	—	—
0132-96-0324	32-06313	1.25–1.83	QBT3	1922	—	—	—	1922	1922	1922	1921	—	—	—	1920	—	—
0132-96-0755	32-06314	0.00–0.50	QBT3	—	—	—	2069	—	2069	2069	2068	—	—	—	—	—	—
0132-96-0327	32-06315	0.00–0.50	SOIL	1922	—	—	—	1922	1922	1922	1921	—	—	—	1920	—	—
0132-96-0322	32-06323	0.00–0.50	SOIL	1922	—	—	—	1922	1922	1922	1921	—	—	—	1920	—	—
0132-96-0321	32-06325	0.00–0.50	SOIL	1922	—	—	—	1922	1922	1922	1921	—	—	—	1920	—	—
0132-96-0802	32-06342	1.50–2.00	SOIL	—	—	—	2069	—	2069	2069	2068	—	—	—	2067	—	—
0132-96-0801	32-06344	1.50–2.00	SOIL	—	—	—	2069	—	2069	2069	2068	—	—	—	2067	—	—
0132-96-0751	32-06353	0.00–0.50	QBT3	—	—	—	2069	—	2069	2069	2068	—	—	—	—	—	—
0132-96-0752	32-06357	0.00–0.50	SOIL	—	—	—	2069	—	2069	2069	2068	—	—	—	—	—	—

Table 8.5-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins and Furans	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
0132-96-0753	32-06358	0.00–0.50	QBT3	—	—	—	2069	—	2069	2069	2068	—	—	—	—	—	—
0132-96-0611	32-06365	5.00–5.25	QBT4	—	—	—	2005	2005	2005	2005	2004	—	—	—	2003	2003	—
0132-96-0612	32-06366	4.00–4.25	QBT4	—	—	—	2005	2005	2005	2005	2004	—	—	—	2003	2003	—
0132-96-0614	32-06377	0.00–0.50	QBT4	—	—	—	2052	2052	2052	2052	2051	—	—	—	2049	2049	—

Note: Numbers in analyte columns are request numbers.
* — = Analysis not requested.

Table 8.5-2
Inorganic Chemicals above BVs at SWMU 32-002(b)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Thallium	Zinc
QBT2,3,4 Background Value[a]				**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**11.2**	**482**	**0.1**	**6.58**	**na**[b]	**na**	**0.3**	**1**	**1.1**	**63.5**
SOIL Background Value[a]				**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**0.73**	**48.8**
RE00-08-15167	00-603589	3.50–4.50	QBT3	—[c]	—	51.3	—	—	13.6 (J)	—	—	0.59 (U)	13.2	—	—	11.2 (J)	8.5	—	—	—	—	—
RE00-08-15168	00-603589	5.50–6.50	QBT3	—	—	60.3	—	—	14.7 (J)	—	—	0.58 (U)	—	—	—	11.3 (J)	2.4	—	—	—	—	—
RE00-08-15169	00-603590	5.50–6.50	QBT3	—	—	77.2 (J-)	—	—	22.2 (J-)	—	5.4 (J-)	—	51.1	—	—	14.5	3.5	—	—	—	—	—
RE00-08-15170	00-603590	7.50–8.50	QBT3	—	—	—	—	—	45.6 (J-)	—	—	—	31.7	—	—	22.2	1.3	—	0.31 (J)	—	—	98.7 (J-)
RE00-08-15171	00-603591	5.50–6.50	QBT3	—	—	166 (J-)	—	—	45.1 (J-)	—	4.8 (J-)	—	—	—	—	23.2	0.92	—	0.39 (J)	—	—	—
RE00-08-15172	00-603591	7.50–8.50	QBT3	—	—	—	—	—	60.7 (J-)	—	—	—	—	—	—	28.5	0.39	—	0.33 (J)	—	—	—
RE00-08-15173	00-603592	3.50–4.50	QBT3	0.78 (U)	—	—	—	—	44 (J-)	—	—	—	—	—	—	21.6	—	—	—	—	—	—
RE00-08-15174	00-603592	5.50–6.50	QBT3	—	—	—	—	—	48.3 (J-)	—	—	—	—	—	—	23.5	—	—	0.32 (J)	—	—	—
RE00-08-15175	00-603593	0.00–1.00	QBT3	—	6.8 (J)	—	—	—	22.2	—	8.4	—	71	—	5.35	—	0.55	—	0.33 (J)	6.7 (J+)	—	—
RE00-08-15176	00-603593	2.00–3.00	QBT3	0.51 (U)	—	—	—	—	10.5 (J)	—	—	0.51 (U)	17.7	—	0.406	—	—	—	0.5 (J)	1.2 (J+)	—	—
RE00-08-15177	00-603594	3.50–4.50	QBT3	—	—	—	—	—	13.4 (J-)	—	—	—	16.3	—	0.86	7.3	—	—	0.34 (J)	—	—	—
RE00-08-15178	00-603594	6.50–7.50	QBT3	—	—	—	—	—	22.6 (J-)	—	—	—	—	—	0.166	12.2	—	—	0.33 (J)	—	—	—
RE00-08-15179	00-603595	1.20–2.20	QBT3	0.79 (U)	7.5 (J+)	57.5 (J-)	—	—	—	—	6.1 (J-)	—	22	—	1.92	—	0.88	—	—	—	—	66.4 (J)
RE00-08-15180	00-603595	3.20–4.20	QBT3	—	—	220 (J-)	—	—	38.4 (J-)	—	6.3 (J-)	—	13	—	2	22.6	0.36	—	0.45 (J)	—	—	—
RE00-08-15181	00-603596	1.25–2.25	QBT3	—	—	55.1	—	—	10.3 (J)	—	5.6 (J)	—	13.6	—	0.546 (J)	6.9 (J)	0.16 (J)	—	0.34 (J)	—	—	—
RE00-08-15182	00-603596	3.25–4.25	QBT3	—	—	—	—	—	17.8 (J+)	—	—	—	—	—	—	9 (J+)	0.13 (J)	—	—	—	—	—
RE00-08-15183	00-603597	0.75–1.75	QBT3	0.54 (U)	2.8 (J)	53.2	—	—	15.2	—	6.5	0.52 (U)	45.9	—	2.18	7.8	—	0.006 (J)	—	4.8 (J+)	—	—
RE00-08-15184	00-603597	2.75–3.75	QBT3	0.52 (U)	—	—	—	—	8 (J)	—	—	—	20.8	—	0.65	—	—	0.0056 (J)	—	5.1 (J+)	—	—
RE00-08-15185	00-603598	1.25–2.25	QBT3	0.53 (U)	—	—	—	—	7.2 (J)	—	—	—	14.4	—	2.12	—	—	—	—	—	—	—
RE00-08-15186	00-603598	3.25–4.25	QBT3	0.53 (U)	—	—	—	—	10.9 (J)	—	—	—	—	—	0.205	—	—	0.0021 (J)	—	—	—	—
RE00-08-15187	00-603599	0.00–0.50	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	3	—	—	—	—	—
RE00-08-15188	00-603599	2.50–3.50	QBT2	0.56 (U)	—	—	—	—	—	—	—	0.56 (U)	—	—	—	—	0.56	—	0.56 (U)	—	—	—
0132-96-0325	32-06312	0.00–0.50	SOIL	11 (UJ)	—	—	1.9	—	77	—	27 (J+)	NA[d]	220	—	48	—	NA	NA	—	21	2.1 (U)	110
0132-96-0326	32-06312	0.50–1.00	QBT3	10 (UJ)	4.1 (J-)	—	—	—	7.2	—	6.2 (J+)	NA	37	—	6.4	—	NA	NA	1 (U)	3.1	2.1 (U)	—
0132-96-0323	32-06313	0.00–0.50	SOIL	10 (UJ)	—	—	1	—	84	—	31 (J+)	NA	200	—	42	—	NA	NA	—	19	2.1 (U)	190
0132-96-0324	32-06313	1.25–1.83	QBT3	10 (UJ)	—	—	—	—	9.1	—	—	NA	—	—	NA	—	NA	NA	1 (U)	4	2 (U)	—
0132-96-0755	32-06314	0.00–0.50	QBT3	10 (UJ)	—	—	—	—	—	—	—	NA	—	—	0.2	—	NA	NA	1 (U)	2 (U)	1.3 (U)	—
0132-96-0327	32-06315	0.00–0.50	SOIL	11 (UJ)	—	—	0.53 (U)	—	—	—	—	NA	58	—	4.3	—	NA	NA	—	2.1	2.1 (U)	—
0132-96-0322	32-06323	0.00–0.50	SOIL	12 (UJ)	—	—	0.59 (U)	—	—	—	—	NA	—	—	0.12 (U)	—	NA	NA	—	2.4 (U)	2.4 (U)	—
0132-96-0321	32-06325	0.00–0.50	SOIL	10 (UJ)	—	—	0.52 (U)	—	22	—	—	NA	82	—	12	—	NA	NA	—	5.2	2.1 (U)	52

Table 8.5-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Thallium	Zinc
QBT2,3,4 Background Value[a]				**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**11.2**	**482**	**0.1**	**6.58**	**na**[b]	**na**	**0.3**	**1**	**1.1**	**63.5**
SOIL Background Value[a]				**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**0.73**	**48.8**
0132-96-0802	32-06342	1.50–2.00	SOIL	11 (UJ)	—	—	0.54 (U)	—	—	—	—	NA	32 (J-)	—	5.9	—	NA	NA	—	2.2 (U)	1.3 (U)	—
0132-96-0801	32-06344	1.50–2.00	SOIL	11 (U)	—	—	2.1	—	—	—	—	NA	61	—	9.4	—	NA	NA	—	2.1 (U)	1.3 (U)	67
0132-96-0751	32-06353	0.00–0.50	QBT3	10 (UJ)	—	54	—	4700	—	—	7.1	NA	43 (J-)	830	0.17	—	NA	NA	1	2 (U)	1.3	—
0132-96-0752	32-06357	0.00–0.50	SOIL	10 (UJ)	—	—	0.51 (U)	—	—	—	—	NA	38 (J-)	—	1.4	—	NA	NA	—	2 (U)	1.3 (U)	—
0132-96-0753	32-06358	0.00–0.50	QBT3	10 (UJ)	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA	1 (U)	2 (U)	1.3 (U)	—
0132-96-0611	32-06365	5.00–5.25	QBT4	12 (UJ)	—	76	—	—	—	3.6	4.8	NA	33	—	5	—	NA	NA	—	2.4 (U)	1.5 (U)	68 (J-)
0132-96-0612	32-06366	4.00–4.25	QBT4	11 (UJ)	—	—	—	2500	—	—	5.3	NA	—	—	0.11 (U)	—	NA	NA	—	2.1 (U)	1.3 (U)	—
0132-96-0614	32-06377	0.00–0.50	QBT4	6.5 (U)	—	78.7	—	—	—	3.6 (J)	5.8	NA	23.6	—	—	—	NA	NA	0.65 (J)	1.6 (U)	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

[d] NA = Not analyzed.

Table 8.5-3
Organic Chemicals Detected at SWMU 32-002(b)

Sample ID	Location ID	Depth (ft)	Media	Anthracene	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Carbazole	Chrysene	Di-n-butylphthalate	Dibenz(a,h)anthracene
RE00-08-15167	00-603589	3.50–4.50	QBT3	—[a]	—	—	—	—	—	—	—	0.23 (J)	—	NA[b]	—	—	—
RE00-08-15168	00-603589	5.50–6.50	QBT3	—	—	—	—	—	—	—	—	0.098 (J)	—	NA	—	—	—
RE00-08-15169	00-603590	5.50–6.50	QBT3	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE00-08-15170	00-603590	7.50–8.50	QBT3	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE00-08-15171	00-603591	5.50–6.50	QBT3	—	—	—	—	—	—	—	—	0.7	0.085 (J)	NA	—	—	—
RE00-08-15172	00-603591	7.50–8.50	QBT3	—	—	—	—	—	—	—	—	0.69	0.051 (J)	NA	—	—	—
RE00-08-15173	00-603592	3.50–4.50	QBT3	—	0.4	—	—	—	—	—	—	—	—	NA	—	—	—
RE00-08-15174	00-603592	5.50–6.50	QBT3	—	0.078	—	—	—	—	—	—	—	—	NA	—	—	—
RE00-08-15175	00-603593	0.00–1.00	QBT3	—	0.041	—	—	—	—	—	—	—	—	NA	0.038 (J)	—	—
RE00-08-15176	00-603593	2.00–3.00	QBT3	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE00-08-15177	00-603594	3.50–4.50	QBT3	—	—	—	—	—	—	—	—	0.32 (J)	—	NA	—	—	—
RE00-08-15178	00-603594	6.50–7.50	QBT3	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE00-08-15179	00-603595	1.20–2.20	QBT3	—	0.088	0.14 (J)	0.41	0.69	0.3 (J)	0.52	—	—	—	NA	0.48	—	0.09 (J)
RE00-08-15180	00-603595	3.20–4.20	QBT3	—	0.059	—	—	—	—	—	—	—	—	NA	—	—	—
RE00-08-15181	00-603596	1.25–2.25	QBT3	—	—	—	—	—	—	—	—	0.12 (J)	—	NA	—	—	—
RE00-08-15182	00-603596	3.25–4.25	QBT3	—	—	—	—	—	—	—	—	0.44	—	NA	—	—	—
RE00-08-15183	00-603597	0.75–1.75	QBT3	—	0.031 (J)	—	—	0.039 (J)	—	—	—	—	—	NA	0.041 (J)	—	—
RE00-08-15184	00-603597	2.75–3.75	QBT3	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE00-08-15185	00-603598	1.25–2.25	QBT3	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE00-08-15186	00-603598	3.25–4.25	QBT3	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE00-08-15187	00-603599	0.00–0.50	SOIL	—	—	0.039 (J)	0.061 (J)	0.091 (J)	—	0.072 (J)	—	—	—	NA	0.091 (J)	—	—
RE00-08-15188	00-603599	2.50–3.50	QBT2	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
0132-96-0611	32-06365	5.00–5.25	QBT4	—	NA	—	—	—	—	—	—	—	—	—	—	0.054 (J)	—
0132-96-0612	32-06366	4.00–4.25	QBT4	0.085 (J)	NA	0.27 (J)	0.3 (J)	0.61 (J)	0.13 (J)	0.24 (J)	—	—	—	0.11	0.48 (J)	0.77	—
0132-96-0614	32-06377	0.00–0.50	QBT4	—	NA	0.023 (J)	0.03 (J)	0.048 (J)	0.045 (J)	0.036 (J)	0.076 (J)	0.059 (J)	—	NA	0.075 (J)	—	—

Table 8.5-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)
RE00-08-15167	00-603589	3.50–4.50	QBT3	—	0.00000052 (J)	0.00000128 (J)	—	—	—	—	—	—	—
RE00-08-15168	00-603589	5.50–6.50	QBT3	—	0.00000215 (J)	0.00000449 (J)	—	—	—	—	—	—	0.000000178 (J)
RE00-08-15169	00-603590	5.50–6.50	QBT3	—	0.00000128 (J)	0.00000323 (J)	—	—	—	—	—	—	—
RE00-08-15170	00-603590	7.50–8.50	QBT3	—	0.000000373 (J)	0.00000085 (J)	—	—	—	—	—	—	—
RE00-08-15171	00-603591	5.50–6.50	QBT3	—	0.0000195 (J)	0.0000468 (J)	0.00000428 (J)	—	0.0000122 (J)	0.000000307 (J)	0.00000083 (J)	0.000000656 (J)	0.00000515 (J)
RE00-08-15172	00-603591	7.50–8.50	QBT3	—	0.0000101	0.0000218	0.00000318 (J)	0.000000195 (J)	0.00000868 (J)	—	0.000000406 (J)	0.000000286 (J)	0.00000212
RE00-08-15173	00-603592	3.50–4.50	QBT3	—	0.0000047	0.00000824	—	0.000000318 (J)	0.00000434 (J)	—	—	—	0.000000318
RE00-08-15174	00-603592	5.50–6.50	QBT3	—	0.00000174 (J)	0.00000323	—	—	—	—	—	—	—
RE00-08-15175	00-603593	0.00–1.00	QBT3	0.05 (J)	0.0000738	0.000215	0.0000163	0.00000143 (J)	0.0000458	0.000000769 (J)	0.00000218 (J)	0.00000146 (J)	0.0000225
RE00-08-15176	00-603593	2.00–3.00	QBT3	—	0.00000391	0.00000942	0.000000838 (J)	—	0.00000217	—	—	—	—
RE00-08-15177	00-603594	3.50–4.50	QBT3	—	0.00000604	0.0000147	—	—	0.00000569 (J)	—	—	—	0.00000106
RE00-08-15178	00-603594	6.50–7.50	QBT3	—	0.00000166 (J)	0.00000443	—	—	—	—	—	—	0.000000184
RE00-08-15179	00-603595	1.20–2.20	QBT3	0.11 (J)	0.000102	0.000329	0.0000392	0.0000018 (J)	0.000123	0.000000668 (J)	0.00000272	0.00000125 (J)	0.0000215
RE00-08-15180	00-603595	3.20–4.20	QBT3	—	0.0000401	0.000124	0.0000165 (J)	0.000000873 (J)	0.0000578	0.000000302 (J)	0.0000012 (J)	0.000000594 (J)	0.0000075
RE00-08-15181	00-603596	1.25–2.25	QBT3	—	0.000084	0.000163	0.0000238 (J)	0.0000012 (J)	0.0000749	0.000000763 (J)	0.00000222 (J)	0.00000167 (J)	0.0000127
RE00-08-15182	00-603596	3.25–4.25	QBT3	—	0.0000283	0.0000585	0.00000757 (J)	0.000000472 (J)	0.0000269	—	0.000000718 (J)	0.00000045 (J)	0.00000368
RE00-08-15183	00-603597	0.75–1.75	QBT3	0.044 (J)	0.00032	0.000555	0.0000789	0.00000602	0.000245	0.00000313	0.00000859	0.00000672	0.0000498
RE00-08-15184	00-603597	2.75–3.75	QBT3	—	0.0000139	0.0000241	0.00000329	—	0.0000097	—	0.000000422 (J)	—	0.00000202
RE00-08-15185	00-603598	1.25–2.25	QBT3	—	0.00000161 (J)	0.00000161	0.000000396 (J)	—	0.000000969	—	—	—	—
RE00-08-15186	00-603598	3.25–4.25	QBT3	—	0.000000607 (J)	0.00000115	—	—	—	—	—	—	—
RE00-08-15187	00-603599	0.00–0.50	SOIL	0.14 (J)	0.0000422	0.000107	0.00000566	0.000000523 (J)	0.0000151	0.000000491 (J)	0.00000134 (J)	0.000000839 (J)	0.0000126
RE00-08-15188	00-603599	2.50–3.50	QBT2	—	0.00000167 (J)	0.00000407	—	—	0.000000321	—	—	—	—
0132-96-0611	32-06365	5.00–5.25	QBT4	—	NA	NA	NA	NA	NA	NA	NA	NA	NA
0132-96-0612	32-06366	4.00–4.25	QBT4	0.99	NA	NA	NA	NA	NA	NA	NA	NA	NA
0132-96-0614	32-06377	0.00–0.50	QBT4	0.074 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 8.5-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
RE00-08-15167	00-603589	3.50–4.50	QBT3	—	—	—	—	—	—	—	0.00000464 (J)	—
RE00-08-15168	00-603589	5.50–6.50	QBT3	—	—	—	—	—	—	—	0.000018 (J)	—
RE00-08-15169	00-603590	5.50–6.50	QBT3	—	—	—	—	—	—	—	0.0000127 (J)	—
RE00-08-15170	00-603590	7.50–8.50	QBT3	—	—	—	—	—	—	—	0.00000321 (J)	—
RE00-08-15171	00-603591	5.50–6.50	QBT3	0.000000285 (J)	0.000000183 (J)	—	0.000000304 (J)	0.00000488 (J)	—	—	0.00018 (J)	0.0000118 (J)
RE00-08-15172	00-603591	7.50–8.50	QBT3	0.00000027 (J)	—	—	0.000000161 (J)	0.00000278 (J)	—	—	0.0000899	0.00000799 (J)
RE00-08-15173	00-603592	3.50–4.50	QBT3	0.000000411 (J)	0.000000167 (J)	—	0.000000215 (J)	0.00000294 (J)	—	—	0.0000414	0.00000481 (J)
RE00-08-15174	00-603592	5.50–6.50	QBT3	—	—	—	—	—	—	—	0.0000153	0.00000161 (J)
RE00-08-15175	00-603593	0.00–1.00	QBT3	0.0000014 (J)	0.000000737 (J)	0.000000267 (J)	0.00000114 (J)	0.0000235	—	—	0.000569 (J)	0.000043
RE00-08-15176	00-603593	2.00–3.00	QBT3	—	—	—	—	0.0000005	—	—	0.0000256 (J)	0.00000159 (J)
RE00-08-15177	00-603594	3.50–4.50	QBT3	0.000000182 (J)	—	—	—	0.00000207 (J)	—	—	0.0000438	0.00000441 (J)
RE00-08-15178	00-603594	6.50–7.50	QBT3	—	—	—	—	—	—	0.0084 (J+)	0.0000124	0.00000188 (J)
RE00-08-15179	00-603595	1.20–2.20	QBT3	0.00000179 (J)	0.000000826 (J)	0.000000341 (J)	0.0000013 (J)	0.0000358	0.26 (J)	—	0.000948	0.0000969
RE00-08-15180	00-603595	3.20–4.20	QBT3	0.000000565 (J)	0.000000268 (J)	—	0.000000383 (J)	0.0000135	—	—	0.000342	0.0000466
RE00-08-15181	00-603596	1.25–2.25	QBT3	0.000000569 (J)	0.000000386 (J)	—	0.000000584 (J)	0.0000167	—	—	0.00067	0.0000804
RE00-08-15182	00-603596	3.25–4.25	QBT3	—	—	—	—	0.00000486 (J)	—	—	0.000235	0.0000306
RE00-08-15183	00-603597	0.75–1.75	QBT3	0.00000201 (J)	0.00000155 (J)	0.000000485 (J)	0.00000299	0.00007	—	—	0.00246 (J)	0.000285
RE00-08-15184	00-603597	2.75–3.75	QBT3	—	—	—	—	0.00000232	—	—	0.000101 (J)	0.0000124
RE00-08-15185	00-603598	1.25–2.25	QBT3	—	—	—	—	0.000000427	—	—	0.0000112 (J)	0.000000844 (J)
RE00-08-15186	00-603598	3.25–4.25	QBT3	—	—	—	—	—	—	—	0.0000033 (J)	—
RE00-08-15187	00-603599	0.00–0.50	SOIL	0.000000606 (J)	0.000000323 (J)	—	0.000000444 (J)	0.00000875	—	—	0.000411 (J)	0.000013
RE00-08-15188	00-603599	2.50–3.50	QBT2	—	—	—	—	—	—	0.004 (J)	0.000013 (J)	—
0132-96-0611	32-06365	5.00–5.25	QBT4	NA	NA	NA	NA	NA	—	0.003 (J)	NA	NA
0132-96-0612	32-06366	4.00–4.25	QBT4	NA	NA	NA	NA	NA	0.14 (J)	—	NA	NA
0132-96-0614	32-06377	0.00–0.50	QBT4	NA	NA	NA	NA	NA	0.026 (J)	0.014 (J+)	NA	NA

Table 8.5-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzofurans (Totals)	Tetrachloroethene	Trichlorofluoromethane
RE00-08-15167	00-603589	3.50–4.50	QBT3	—	—	—	—	—	—	—	—	—	—
RE00-08-15168	00-603589	5.50–6.50	QBT3	—	—	—	—	0.000000365 (J)	—	—	0.00000019 (J)	—	—
RE00-08-15169	00-603590	5.50–6.50	QBT3	—	—	—	0.000000103 (J)	0.000000103 (J)	—	—	—	—	—
RE00-08-15170	00-603590	7.50–8.50	QBT3	—	—	—	—	—	—	—	—	—	—
RE00-08-15171	00-603591	5.50–6.50	QBT3	—	—	—	0.000000294 (J)	0.00000296 (J)	—	—	0.000000223 (J)	—	—
RE00-08-15172	00-603591	7.50–8.50	QBT3	—	—	—	—	0.00000118	—	—	—	—	—
RE00-08-15173	00-603592	3.50–4.50	QBT3	—	—	—	0.000000375 (J)	0.00000266	—	—	0.000000477	—	—
RE00-08-15174	00-603592	5.50–6.50	QBT3	—	—	—	—	—	—	—	—	—	—
RE00-08-15175	00-603593	0.00–1.00	QBT3	0.000000358 (J)	0.000000945	0.000000212 (J)	0.00000093 (J)	0.00000823	—	0.052 (J)	0.00000227	0.00053 (J)	—
RE00-08-15176	00-603593	2.00–3.00	QBT3	—	—	—	—	0.000000228	—	—	—	—	—
RE00-08-15177	00-603594	3.50–4.50	QBT3	—	—	—	—	0.000000768	—	—	—	—	—
RE00-08-15178	00-603594	6.50–7.50	QBT3	—	—	—	—	0.000000271	—	—	—	—	—
RE00-08-15179	00-603595	1.20–2.20	QBT3	0.000000285 (J)	0.00000109	0.00000023 (J)	0.00000116 (J)	0.000012	—	0.13 (J)	0.00000302	—	—
RE00-08-15180	00-603595	3.20–4.20	QBT3	—	—	—	0.000000345 (J)	0.00000308	—	—	0.000000422	—	—
RE00-08-15181	00-603596	1.25–2.25	QBT3	—	0.000000174	—	0.000000226 (J)	0.00000286	—	—	0.000000403	—	—
RE00-08-15182	00-603596	3.25–4.25	QBT3	—	—	—	—	0.000000398	—	—	—	—	—
RE00-08-15183	00-603597	0.75–1.75	QBT3	0.00000109 (J)	0.00000299	—	0.000000743 (J)	0.00000955	—	0.041 (J)	0.00000213	—	—
RE00-08-15184	00-603597	2.75–3.75	QBT3	—	—	—	—	0.000000283	—	—	0.000000176	—	—
RE00-08-15185	00-603598	1.25–2.25	QBT3	—	—	—	—	—	—	—	—	—	—
RE00-08-15186	00-603598	3.25–4.25	QBT3	—	—	—	—	—	—	—	—	—	—
RE00-08-15187	00-603599	0.00–0.50	SOIL	—	0.000000396	0.000000151 (J)	0.00000037 (J)	0.0000029	0.072 (J)	0.12 (J)	0.000000937	—	—
RE00-08-15188	00-603599	2.50–3.50	QBT2	—	—	—	—	—	—	—	—	—	—
0132-96-0611	32-06365	5.00–5.25	QBT4	NA	NA	NA	NA	NA	—	0.041 (J)	NA	—	0.006
0132-96-0612	32-06366	4.00–4.25	QBT4	NA	NA	NA	NA	NA	0.45 (J)	1	NA	—	0.003 (J)
0132-96-0614	32-06377	0.00–0.50	QBT4	NA	NA	NA	NA	NA	—	0.074 (J)	NA	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] — = Not detected.

[b] NA = Not analyzed.

Table 8.5-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 32-002(b)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236	Uranium-238
QBT2,3,4 Background Value[a]				**na[b]**	**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
SOIL Background Value[a]				**0.013[c]**	**1.65[c]**	**0.054[c]**	**1.31[c]**	**na**	**2.59**	**0.2**	**2.29**
RE00-08-15175	00-603593	0.00–1.00	QBT3	—[d]	0.32	0.242	—	—	—	0.102	—
RE00-08-15176	00-603593	2.00–3.00	QBT3	—	—	—	—	—	—	0.119	—
RE00-08-15179	00-603595	1.20–2.20	QBT3	—	—	—	0.45	—	—	—	—
RE00-08-15183	00-603597	0.75–1.75	QBT3	—	—	0.171	—	—	—	—	—
RE00-08-15184	00-603597	2.75–3.75	QBT3	—	—	0.1	—	—	—	—	—
RE00-08-15188	00-603599	2.50–3.50	QBT2	—	—	—	—	—	—	0.104	—
0132-96-0325	32-06312	0.00–0.50	SOIL	0.929	NA[e]	5	NA	—	—	—	—
0132-96-0326	32-06312	0.50–1.00	QBT3	—	NA	0.356	NA	—	—	—	—
0132-96-0323	32-06313	0.00–0.50	SOIL	1.07	NA	3.76	NA	—	3.55	—	3.04
0132-96-0324	32-06313	1.25–1.83	QBT3	—	NA	0.11	NA	—	—	—	—
0132-96-0755	32-06314	0.00–0.50	QBT3	—	0.58	0.099	NA	NA	—	—	—
0132-96-0327	32-06315	0.00–0.50	SOIL	—	NA	0.613	NA	—	—	—	—
0132-96-0322	32-06323	0.00–0.50	SOIL	—	NA	0.389	NA	—	—	—	—
0132-96-0321	32-06325	0.00–0.50	SOIL	0.146	NA	1.64	NA	—	—	—	—
0132-96-0802	32-06342	1.50–2.00	SOIL	—	—	0.134	NA	NA	—	—	—
0132-96-0801	32-06344	1.50–2.00	SOIL	—	—	0.495	NA	NA	—	—	—
0132-96-0751	32-06353	0.00–0.50	QBT3	—	1.7	0.091	NA	NA	—	—	—
0132-96-0752	32-06357	0.00–0.50	SOIL	—	2.56	0.916	NA	NA	—	—	—
0132-96-0753	32-06358	0.00–0.50	QBT3	—	0.29	—	NA	NA	—	—	—
0132-96-0611	32-06365	5.00–5.25	QBT4	—	—	0.039	NA	—	—	—	—
0132-96-0614	32-06377	0.00–0.50	QBT4	—	—	0.016	NA	0.09	—	—	—

Notes: Results are in pCi/g.

[a] BVs/FVs are from LANL 1998, 059730.

[b] na = Not available.

[c] FV applies to soil and tuff samples collected from 0–0.5 ft only.

[d] — = Not detected or not detected above BV/FV.

[e] NA = Not analyzed.

Table 8.6-1
Samples Collected and Analyses Requested at AOC 32-003

Sample ID	Location ID	Depth (ft)	Media	TAL Metals	PCBs	SVOC	VOCs
RE00-08-15211	00-603600	4.75–5.75	QBT3	09-6	09-5	09-5	09-5
RE00-08-15212	00-603600	6.75–7.25	QBT3	09-6	09-5	09-5	09-5
RE00-08-15205	00-603601	0.00–1.00	SOIL	09-6	09-5	09-5	09-5
RE00-08-15206	00-603601	2.00–2.50	QBT3	09-6	09-5	09-5	09-5
RE00-08-15207	00-603602	0.00–1.00	SOIL	09-39	09-38	09-38	09-38
RE00-08-15208	00-603602	2.00–3.00	QBT3	09-39	09-38	09-38	09-38
RE00-08-15209	00-603603	0.00–1.00	SOIL	09-6	09-5	09-5	09-5
RE00-08-15210	00-603603	2.00–2.50	QBT3	09-6	09-5	09-5	09-5
RE00-08-15203	00-603604	3.00–3.50	SOIL	08-2015	08-2015	08-2015	08-2015
RE00-08-15204	00-603604	5.50–6.50	QBT3	08-2015	08-2015	08-2015	08-2015
RE00-08-15213	00-603605	2.00–3.00	QBT3	08-2015	08-2015	08-2015	08-2015
RE00-08-15214	00-603605	4.00–5.00	QBT3	08-2015	08-2015	08-2015	08-2015
RE00-08-15215	00-603606	2.25–2.75	QBT3	09-6	09-5	09-5	09-5
RE00-08-15216	00-603606	3.75–4.25	QBT3	09-6	09-5	09-5	09-5
RE00-08-15218	00-603607	5.00–6.00	QBT3	09-6	09-5	09-5	09-5
RE00-08-15219	00-603607	7.00–8.00	QBT3	09-6	09-5	09-5	09-5
RE00-08-15217	00-603608	1.50–2.00	QBT3	09-39	09-38	09-38	09-38
RE00-08-15220	00-603608	3.00–3.50	QBT3	09-39	09-38	09-38	09-38
RE00-08-15221	00-603609	1.75–2.25	QBT3	09-6	09-5	09-5	09-5
RE00-08-15222	00-603609	3.25–3.75	QBT3	09-6	09-5	09-5	09-5
RE00-08-15223	00-603610	1.50–2.00	QBT3	09-39	09-38	09-38	09-38
RE00-08-15224	00-603610	3.00–3.50	QBT3	09-39	09-38	09-38	09-38
RE00-08-15225	00-603611	2.25–2.75	QBT3	09-6	09-5	09-5	09-5
RE00-08-15226	00-603611	3.75–4.25	QBT3	09-6	09-5	09-5	09-5

Note: Numbers in analyte columns are request numbers.

Table 8.6-2
Inorganic Chemicals above BVs at AOC 32-003

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Chromium	Cobalt	Copper	Lead	Magnesium	Nickel	Selenium	Sodium	Vanadium	Zinc
QBT3 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**7.14**	**3.14**	**4.66**	**11.2**	**1690**	**6.58**	**0.3**	**2770**	**17**	**63.5**
SOIL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**19.3**	**8.64**	**14.7**	**22.3**	**4610**	**15.4**	**1.52**	**915**	**39.6**	**48.8**
RE00-08-15211	00-603600	4.75–5.75	QBT3	—[b]	—	—	—	—	38.2 (J+)	—	—	—	—	19.1 (J+)	—	—	—	—
RE00-08-15212	00-603600	6.75–7.25	QBT3	—	—	—	—	—	31.4 (J+)	—	—	—	—	16.7 (J+)	0.32 (J)	—	—	—
RE00-08-15205	00-603601	0.00–1.00	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	81.3 (J)
RE00-08-15206	00-603601	2.00–2.50	QBT3	—	—	—	—	—	44.3 (J+)	—	—	—	—	22.7 (J+)	0.32 (J)	—	—	—
RE00-08-15208	00-603602	2.00–3.00	QBT3	—	0.55 (U)	—	—	—	10.3 (J)	—	—	—	—	6.6	—	—	—	—
RE00-08-15209	00-603603	0.00–1.00	SOIL	—	—	—	—	—	—	—	—	24.1	—	—	—	1970 (J-)	—	90.4 (J)
RE00-08-15210	00-603603	2.00–2.50	QBT3	—	—	—	—	—	12.4 (J+)	—	—	12.7	—	7 (J+)	0.61 (U)	—	—	—
RE00-08-15204	00-603604	5.50–6.50	QBT3	14100 (J)	0.55 (U)	4.5	144 (J-)	1.9 (J-)	10 (J-)	5 (J)	8.2 (J-)	26.2	2230 (J-)	12.8	0.63 (U)	—	21 (J-)	—
RE00-08-15213	00-603605	2.00–3.00	QBT3	—	1.3 (U)	—	—	—	—	—	—	12.7	—	—	0.33 (J)	—	—	—
RE00-08-15214	00-603605	4.00–5.00	QBT3	—	—	—	—	—	37.2 (J-)	—	—	—	—	18.1	0.36 (J)	—	—	—
RE00-08-15215	00-603606	2.25–2.75	QBT3	—	—	—	—	—	12.6 (J+)	—	—	—	—	7 (J+)	0.61 (U)	—	—	—
RE00-08-15216	00-603606	3.75–4.25	QBT3	—	0.57 (U)	—	—	—	65.9 (J+)	—	—	—	—	32.5 (J+)	—	—	—	—
RE00-08-15218	00-603607	5.00–6.00	QBT3	—	0.6 (U)	—	—	—	18.7 (U)	—	—	—	—	9.4 (J+)	—	—	—	—
RE00-08-15219	00-603607	7.00–8.00	QBT3	—	—	—	103	—	12.3 (U)	—	—	—	—	6.9 (J+)	0.31 (J)	—	—	—
RE00-08-15217	00-603608	1.50–2.00	QBT3	—	—	—	48.5	—	—	—	5.7	—	—	15.3	—	—	—	—
RE00-08-15220	00-603608	3.00–3.50	QBT3	—	0.6 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15221	00-603609	1.75–2.25	QBT3	—	—	—	—	—	15.2 (J+)	—	—	—	—	7.9 (J+)	0.58 (U)	—	—	—
RE00-08-15222	00-603609	3.25–3.75	QBT3	—	0.61 (U)	—	—	—	19.1 (J+)	—	—	—	—	10.5 (J+)	—	—	—	—
RE00-08-15223	00-603610	1.50–2.00	QBT3	—	0.54 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15224	00-603610	3.00–3.50	QBT3	—	0.54 (U)	—	—	—	9.6 (J)	—	—	—	—	—	—	—	—	—
RE00-08-15225	00-603611	2.25–2.75	QBT3	—	0.52 (U)	—	—	—	15.8 (J+)	—	—	—	—	8.6 (J+)	—	—	—	—
RE00-08-15226	00-603611	3.75–4.25	QBT3	—	0.52 (U)	—	—	—	24.3 (J+)	—	—	—	—	12 (J+)	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] — = Not detected or not detected above BV.

Table 8.6-3
Organic Chemicals Detected at AOC 32-003

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Phenanthrene	Pyrene
RE00-08-15211	00-603600	4.75–5.75	QBT3	—*	—	—	—	—	—	0.82	—	—	—	—	—	—
RE00-08-15212	00-603600	6.75–7.25	QBT3	—	—	—	—	—	—	—	—	—	—	0.007	—	—
RE00-08-15205	00-603601	0.00–1.00	SOIL	26 (J)	0.087 (J)	0.097 (J)	0.15 (J)	0.065 (J)	0.16 (J)	—	0.19 (J)	0.34	0.06 (J)	0.01	0.16 (J)	0.3 (J)
RE00-08-15206	00-603601	2.00–2.50	QBT3	0.088 (J)	—	—	—	—	—	—	—	—	—	0.012	—	—
RE00-08-15207	00-603602	0.00–1.00	SOIL	0.35	0.13 (J)	0.19 (J)	0.39	0.2 (J)	0.33 (J)	—	0.45	0.19 (J)	0.17 (J)	—	0.06 (J)	0.2 (J)
RE00-08-15209	00-603603	0.00–1.00	SOIL	0.15 (J)	0.32 (J)	0.44 (J)	0.57 (J)	0.31 (J)	0.6 (J)	—	0.68 (J)	1.3 (J)	0.3 (J)	0.016	0.73 (J)	1.1 (J)
RE00-08-15210	00-603603	2.00–2.50	QBT3	—	—	—	—	—	—	—	—	0.046 (J)	—	0.011	—	0.042 (J)
RE00-08-15203	00-603604	3.00–3.50	SOIL	—	—	—	—	—	—	—	—	—	—	0.0033 (J)	—	—
RE00-08-15204	00-603604	5.50–6.50	QBT3	—	—	—	—	—	—	0.067 (J)	—	—	—	—	—	—
RE00-08-15213	00-603605	2.00–3.00	QBT3	—	—	—	—	—	—	0.19 (J)	—	—	—	—	—	—
RE00-08-15215	00-603606	2.25–2.75	QBT3	0.072 (J)	—	—	—	—	—	—	—	—	—	0.012	—	—
RE00-08-15216	00-603606	3.75–4.25	QBT3	—	—	—	—	—	—	—	—	—	—	0.01	—	—
RE00-08-15218	00-603607	5.00–6.00	QBT3	—	—	—	—	—	—	0.2 (J)	—	—	—	—	—	—
RE00-08-15219	00-603607	7.00–8.00	QBT3	—	—	—	—	—	—	0.1 (J)	—	—	—	—	—	—
RE00-08-15217	00-603608	1.50–2.00	QBT3	0.051	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15220	00-603608	3.00–3.50	QBT3	0.26	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15221	00-603609	1.75–2.25	QBT3	1.2	—	—	—	—	—	0.48	—	—	—	0.013 (J+)	—	—
RE00-08-15222	00-603609	3.25–3.75	QBT3	—	—	—	—	—	—	—	—	—	—	0.01	—	—
RE00-08-15223	00-603610	1.50–2.00	QBT3	0.06	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15225	00-603611	2.25–2.75	QBT3	0.035	—	—	—	—	—	—	—	—	—	0.0074	—	—
RE00-08-15226	00-603611	3.75–4.25	QBT3	—	—	—	—	—	—	—	—	—	—	0.011	—	—

Notes: Results are in mg/kg.
* — = Not detected.

Table 8.7-1
Samples Collected and Analyses Requested at AOC 32-004

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-15242	00-603612	1.00–1.50	QBT3	08-2018	08-2017	08-2018	08-2018	08-2018	08-2018	08-2017	08-2016	08-2017	08-2018	08-2016	08-2016	08-2017
RE00-08-15243	00-603612	2.50–3.00	QBT3	08-2018	08-2017	08-2018	08-2018	08-2018	08-2018	08-2017	08-2016	08-2017	08-2018	08-2016	08-2016	08-2017
RE00-08-15244	00-603612	5.00–6.00	QBT3	08-2018	08-2017	08-2018	08-2018	08-2018	08-2018	08-2017	08-2016	08-2017	08-2018	08-2016	08-2016	08-2017
0132-96-0354	32-06326	0.00–0.50	SOIL	1929	—*	—	1929	1929	1929	1928	—	—	—	1927	—	—
0132-96-0355	32-06326	0.50–1.00	QBT3	1929	—	—	1929	1929	1929	1928	—	—	—	1927	—	—
0132-96-0356	32-06331	0.00–0.42	SOIL	1929	—	—	1929	1929	1929	1928	—	—	—	1927	—	—
0132-96-0357	32-06336	0.00–0.50	SOIL	1929	—	—	1929	1929	1929	1928	—	—	—	1927	—	—
0132-96-0352	32-06338	0.00–0.50	SOIL	1929	—	—	1929	1929	1929	1928	—	—	—	1927	—	—
0132-96-0353	32-06338	0.50–1.00	SOIL	1929	—	—	1929	1929	1929	1928	—	—	—	1927	—	—
0132-96-0351	32-06340	0.00–0.50	SOIL	—	—	—	—	—	—	1928	—	—	—	1927	—	—
0132-96-0621	32-06363	0.00–0.50	SOIL	—	—	1996	1996	1996	1996	1995	—	—	—	1994	1994	—
0132-96-0622	32-06364	0.00–0.50	SOIL	—	—	1996	1996	1996	1996	1995	—	—	—	1994	1994	—

Note: Numbers in analyte columns are request numbers.
* — = Analysis not requested.

Table 8.7-2
Inorganic Chemicals above BVs at AOC 32-004

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Chromium	Copper	Cyanide (Total)	Lead	Mercury	Nickel	Nitrate	Selenium	Silver	Thallium	Zinc
QBT3 Background Value[a]				**0.5**	**1.63**	**7.14**	**4.66**	**0.5**	**11.2**	**0.1**	**6.58**	**na**[b]	**0.3**	**1**	**1.1**	**63.5**
SOIL Background Value[a]				**0.83**	**0.4**	**19.3**	**14.7**	**0.5**	**22.3**	**0.1**	**15.4**	**na**	**1.52**	**1**	**0.73**	**48.8**
RE00-08-15242	00-603612	1.00–1.50	QBT3	—[c]	—	18.8 (J+)	—	—	—	—	10.2	0.26	—	—	—	—
RE00-08-15243	00-603612	2.50–3.00	QBT3	0.52 (U)	—	44.6 (J+)	—	—	—	—	24.1	—	—	—	—	—
RE00-08-15244	00-603612	5.00–6.00	QBT3	—	—	20.1 (J+)	—	0.55 (U)	—	—	12.4	—	0.31 (J)	—	—	—
0132-96-0354	32-06326	0.00–0.50	SOIL	11 (UJ)	0.55 (U)	—	—	NA[d]	53	0.11 (U)	—	NA	—	2.2 (U)	2.2 (U)	100
0132-96-0355	32-06326	0.50–1.00	QBT3	12 (UJ)	—	—	—	NA	—	0.12 (U)	—	NA	1.2 (U)	2.4 (U)	2.4 (U)	—
0132-96-0356	32-06331	0.00–0.42	SOIL	10 (UJ)	0.51 (U)	—	—	NA	34	—	—	NA	—	2 (U)	2 (U)	51
0132-96-0357	32-06336	0.00–0.50	SOIL	10 (UJ)	0.52 (U)	—	—	NA	—	—	—	NA	—	2.1 (U)	2.1 (U)	—
0132-96-0352	32-06338	0.00–0.50	SOIL	11 (UJ)	0.54	32	15 (J+)	NA	89	0.11	—	NA	—	3.3	2.2 (U)	83
0132-96-0353	32-06338	0.50–1.00	SOIL	11 (UJ)	0.56 (U)	—	—	NA	—	0.11 (U)	—	NA	—	2.2 (U)	2.2 (U)	—
0132-96-0351	32-06340	0.00–0.50	SOIL	11 (UJ)	1.1	—	26 (J+)	NA	200	0.11 (U)	—	NA	—	2.1 (U)	2.1 (U)	150
0132-96-0621	32-06363	0.00–0.50	SOIL	5.8 (U)	0.58 (U)	—	—	NA	—	0.45	—	NA	—	—	—	50.2
0132-96-0622	32-06364	0.00–0.50	SOIL	5.8 (U)	0.58 (U)	—	—	NA	—	0.55	—	NA	—	—	—	102

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] BVs are from LANL 1998, 059730.
[b] na = Not available.
[c] — = Not detected or not detected above BV.
[d] NA = Not analyzed.

Table 8.7-3
Organic Chemicals Detected at AOC 32-004

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Chrysene	Di-n-octylphthalate	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
RE00-08-15243	00-603612	2.50–3.00	QBT3	—[a]	—	—	—	—	—	—	—	0.31 (J)	—	—	—	—	—	—	—	—	—
RE00-08-15244	00-603612	5.00–6.00	QBT3	—	—	—	—	—	—	—	—	0.058 (J)	—	—	—	—	—	—	—	—	—
0132-96-0354	32-06326	0.00–0.50	SOIL	—	NA[b]	0.32	1.4	1.5	1.6	0.65	1.4	0.88	2.4	2.4	—	3.4	—	0.67	—	1.7	2.7
0132-96-0356	32-06331	0.00–0.42	SOIL	0.19	NA	0.32	0.89	0.91	0.96	0.42	1.1	0.25	0.96	1.6	—	2.3	0.19	0.42	0.23	1.7	1.8
0132-96-0357	32-06336	0.00–0.50	SOIL	—	NA	—	—	—	—	—	—	—	—	—	—	0.18	—	—	—	—	—
0132-96-0352	32-06338	0.00–0.50	SOIL	—	NA	—	1.7	1.9	2.2	1.4	1.7	0.69	3.1	3.5	—	4.8	—	1.3	—	2.2	3.8
0132-96-0353	32-06338	0.50–1.00	SOIL	—	NA	—	—	—	—	—	—	—	0.3	0.21	—	0.2	—	—	—	—	0.2
0132-96-0351	32-06340	0.00–0.50	SOIL	—	NA	2.3	8.2	8.4	7.8	4.9	7.9	1.8	8.3	14	—	18	—	4.8	—	11	15
0132-96-0621	32-06363	0.00–0.50	SOIL	—	—	—	—	—	0.12 (J)	—	—	—	—	—	—	0.18 (J)	—	—	—	0.1 (J)	0.15 (J)
0132-96-0622	32-06364	0.00–0.50	SOIL	—	0.002 (J)	—	0.17 (J)	0.21 (J)	0.31 (J)	0.15 (J)	0.15 (J)	0.097 (J)	0.18 (J)	0.25 (J)	0.097 (J)	0.48	—	0.16 (J)	—	0.24 (J)	0.37 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] — = Not detected.
[b] NA = Not analyzed.

Table 8.7-4
Radionuclides Detected or Detected above BVs/FVs at AOC 32-004

Sample ID	Location ID	Depth (ft)	Media	Americium-241
SOIL Background Value[a]				**0.013**[b]
0132-96-0354	32-06326	0.00–0.50	SOIL	0.091

Note: Results are in pCi/g.
[a] BVs/FVs are from LANL 1998, 059730.
[b] FV applies to soil samples collected from 0-0.5 ft only.

Table 9.3-1
Samples Collected and Analyses Requested at SWMU 41-001

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-08-15392	00-603725	5.50–6.50	QBT1G	09-786	09-785	09-786	09-786	09-786	09-786	09-785	09-784	09-785	09-786	09-784	09-784	09-785
RE00-08-15393	00-603725	7.50–8.50	QBT1G	09-786	09-785	09-786	09-786	09-786	09-786	09-785	09-784	09-785	09-786	09-784	09-784	09-785
RE00-08-15394	00-603726	5.00–6.00	QBT1G	09-786	09-785	09-786	09-786	09-786	09-786	09-785	09-784	09-785	09-786	09-784	09-784	09-785
RE00-08-15395	00-603726	7.00–8.00	QBT1G	09-786	09-785	09-786	09-786	09-786	09-786	09-785	09-784	09-785	09-786	09-784	09-784	09-785
RE00-08-15396	00-603727	2.00–3.00	QBT1G	09-768	09-768	09-768	09-768	09-768	09-768	09-768	09-768	09-768	09-768	09-768	09-768	09-768
RE00-08-15397	00-603727	4.00–5.00	QBT1G	09-768	09-768	09-768	09-768	09-768	09-768	09-768	09-768	09-768	09-768	09-768	09-768	09-768
RE00-08-15398	00-603728	1.75–2.75	QBT1G	09-776	09-775	09-776	09-776	09-776	09-776	09-775	09-774	09-775	09-776	09-774	09-774	09-775
RE00-08-15399	00-603728	3.75–4.75	QBT1G	09-776	09-775	09-776	09-776	09-776	09-776	09-775	09-774	09-775	09-776	09-774	09-774	09-775
RE00-08-15400	00-603729	2.00–3.00	QBT1G	09-776	09-775	09-776	09-776	09-776	09-776	09-775	09-774	09-775	09-776	09-774	09-774	09-775
RE00-08-15401	00-603729	4.00–5.00	QBT1G	09-776	09-775	09-776	09-776	09-776	09-776	09-775	09-774	09-775	09-776	09-774	09-774	09-775
RE00-08-15402	00-603730	3.50–4.50	QBT1G	09-776	09-775	09-776	09-776	09-776	09-776	09-775	09-774	09-775	09-776	09-774	09-774	09-775
RE00-08-15403	00-603730	5.50–6.50	QBT1G	09-776	09-775	09-776	09-776	09-776	09-776	09-775	09-774	09-775	09-776	09-774	09-774	09-775
RE00-08-15404	00-603731	3.00–4.00	QBT1G	09-776	09-775	09-776	09-776	09-776	09-776	09-775	09-774	09-775	09-776	09-774	09-774	09-775
RE00-08-15405	00-603731	5.00–6.00	QBT1G	09-776	09-775	09-776	09-776	09-776	09-776	09-775	09-774	09-775	09-776	09-774	09-774	09-775
RE00-08-15406	00-603732	3.50–4.50	QBT1G	09-776	09-775	09-776	09-776	09-776	09-776	09-775	09-774	09-775	09-776	09-774	09-774	09-775
RE00-08-15407	00-603732	5.50–6.50	QBT1G	09-776	09-775	09-776	09-776	09-776	09-776	09-775	09-774	09-775	09-776	09-774	09-774	09-775
RE00-08-15408	00-603733	2.25–3.25	QBT1G	09-776	09-775	09-776	09-776	09-776	09-776	09-775	09-774	09-775	09-776	09-774	09-774	09-775
RE00-08-15409	00-603733	4.25–5.25	QBT1G	09-776	09-775	09-776	09-776	09-776	09-776	09-775	09-774	09-775	09-776	09-774	09-774	09-775
RE00-08-15410	00-603734	2.00–3.00	QBT1G	09-776	09-775	09-776	09-776	09-776	09-776	09-775	09-774	09-775	09-776	09-774	09-774	09-775
RE00-08-15411	00-603734	4.00–5.00	QBT1G	09-776	09-775	09-776	09-776	09-776	09-776	09-775	09-774	09-775	09-776	09-774	09-774	09-775
RE00-08-15412	00-603735	0.00–1.00	SED	09-776	09-775	09-776	09-776	09-776	09-776	09-775	09-774	09-775	09-776	09-774	09-774	09-775
RE00-08-15413	00-603735	2.25–3.25	QBT1G	09-776	09-775	09-776	09-776	09-776	09-776	09-775	09-774	09-775	09-776	09-774	09-774	09-775
RE00-08-15414	00-603736	4.50–5.50	QBT1G	09-786	09-785	09-786	09-786	09-786	09-786	09-785	09-784	09-785	09-786	09-784	09-784	09-785
RE00-08-15415	00-603736	6.50–7.50	QBT1G	09-786	09-785	09-786	09-786	09-786	09-786	09-785	09-784	09-785	09-786	09-784	09-784	09-785
RE00-08-15416	00-603737	0.00–1.00	SED	09-786	09-785	09-786	09-786	09-786	09-786	09-785	09-784	09-785	09-786	09-784	09-784	09-785
RE00-08-15417	00-603737	2.00–3.00	SED	09-786	09-785	09-786	09-786	09-786	09-786	09-785	09-784	09-785	09-786	09-784	09-784	09-785
RE00-08-15422	00-603740	2.50–3.50	QBT1G	09-768	09-768	09-768	09-768	09-768	09-768	09-768	09-768	09-768	09-768	09-768	09-768	09-768
RE00-08-15423	00-603740	4.00–5.00	QBT1G	09-786	09-785	09-786	09-786	09-786	09-786	09-785	09-784	09-785	09-786	09-784	09-784	09-785
RE00-08-15424	00-603740	6.50–8.00	QBT1G	09-786	09-785	09-786	09-786	09-786	09-786	09-785	09-784	09-785	09-786	09-784	09-784	09-785
0441-95-0003	41-01007	0.00–1.00	QBT2	—*	—	—	139	139	139	—	—	—	—	138	138	—
0441-95-0004	41-01007	4.00–5.00	QBT2	—	—	—	139	139	139	—	—	—	—	138	138	—
0441-95-0009	41-01008	0.00–1.00	QBT2	—	—	—	139	139	139	—	—	—	—	138	138	—
0441-95-0010	41-01008	4.00–5.00	QBT2	—	—	—	139	139	139	—	—	—	—	138	138	—
0441-95-0011	41-01008	9.00–10.00	QBT2	—	—	—	139	139	139	—	—	—	—	138	138	—

Note: Numbers in analyte columns are request numbers.
* — = Analysis not requested.

Table 9.3-2
Inorganic Chemicals above BVs at SWMU 41-001

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Calcium	Chromium	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
SED Background Value[a]				**15400**	**0.83**	**3.98**	**127**	**4420**	**10.5**	**11.2**	**0.82**	**13800**	**19.7**	**2370**	**543**	**9.38**	**na**[b]	**na**	**0.3**	**19.7**	**60.2**
QBT1G Background Value[a]				**3560**	**0.5**	**0.56**	**25.7**	**1900**	**2.6**	**3.96**	**0.5**	**3700**	**13.5**	**739**	**189**	**2**	**na**	**na**	**0.3**	**4.59**	**40**
RE00-08-15392	00-603725	5.50–6.50	QBT1G	4170	—[c]	0.67 (J)	26.8 (J+)	2500 (J)	2.7	4 (J+)	0.56 (UJ)	—	—	—	—	3.1	1.4	—	0.56 (U)	—	—
RE00-08-15393	00-603725	7.50–8.50	QBT1G	4370	—	—	—	—	2.7	—	0.56 (UJ)	—	—	—	—	3.3	2.1	—	0.56 (U)	—	—
RE00-08-15394	00-603726	5.00–6.00	QBT1G	—	—	—	—	—	9.3	—	0.55 (UJ)	—	—	—	—	5.7	0.91	—	0.55 (U)	—	—
RE00-08-15395	00-603726	7.00–8.00	QBT1G	—	—	—	—	—	2.9	—	0.55 (UJ)	—	—	—	—	3.3	0.73	—	0.55 (U)	—	—
RE00-08-15396	00-603727	2.00–3.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	—	0.12 (J)	—	0.53 (U)	—	—
RE00-08-15397	00-603727	4.00–5.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	—	0.69	—	0.53 (U)	—	—
RE00-08-15398	00-603728	1.75–2.75	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	2.2	0.42	—	0.53 (U)	—	—
RE00-08-15399	00-603728	3.75–4.75	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	0.53 (U)	—	—
RE00-08-15400	00-603729	2.00–3.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	2.6	0.41	—	0.53 (U)	—	—
RE00-08-15401	00-603729	4.00–5.00	QBT1G	—	0.53 (U)	—	—	—	—	—	—	—	—	—	—	—	0.27	—	0.53 (U)	—	—
RE00-08-15402	00-603730	3.50–4.50	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	2.2	0.65	—	0.54 (U)	—	—
RE00-08-15403	00-603730	5.50–6.50	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	2.1	1.6	—	0.53 (U)	—	—
RE00-08-15404	00-603731	3.00–4.00	QBT1G	—	—	0.68 (J)	28.1 (J)	—	—	—	—	—	—	—	206 (J)	2.5 (J)	0.96	—	0.54 (U)	—	—
RE00-08-15405	00-603731	5.00–6.00	QBT1G	—	—	—	—	3370 (J-)	—	—	—	—	—	—	—	2.3	2.4	—	0.53 (U)	—	—
RE00-08-15406	00-603732	3.50–4.50	QBT1G	—	—	—	27.3 (J)	1960 (J-)	—	—	—	—	—	—	—	2.6	0.53	—	0.53 (U)	—	—
RE00-08-15407	00-603732	5.50–6.50	QBT1G	—	0.75 (U)	—	—	—	—	—	—	—	—	—	—	2.3	0.46	—	0.54 (U)	—	—
RE00-08-15408	00-603733	2.25–3.25	QBT1G	—	—	0.72 (U)	27.4	2760	—	—	—	—	—	—	—	2.3	0.55	—	0.54 (U)	—	—
RE00-08-15409	00-603733	4.25–5.25	QBT1G	—	—	0.61 (U)	26.4	2220	32	—	—	—	—	—	—	15.9	0.17 (J)	—	0.53 (U)	—	—
RE00-08-15410	00-603734	2.00–3.00	QBT1G	—	—	—	28.9 (J)	—	—	—	—	—	—	—	—	2.2	0.11 (J)	—	0.54 (U)	—	—
RE00-08-15411	00-603734	4.00–5.00	QBT1G	—	—	—	31.9 (J)	2870 (J-)	—	—	—	—	—	—	—	2.1	—	—	0.53 (U)	—	—
RE00-08-15412	00-603735	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	7.2	0.0098	0.61 (U)	—	—
RE00-08-15413	00-603735	2.25–3.25	QBT1G	—	—	0.82 (J)	27.9	—	—	—	—	3830	—	—	—	—	2.7	—	—	—	—
RE00-08-15414	00-603736	4.50–5.50	QBT1G	4010	—	1.2	68.7 (J+)	2020 (J)	3.5	4.1 (J+)	—	6120	13.7	755	278	3	0.5	0.0033 (J)	0.54 (U)	7.5	41.8
RE00-08-15415	00-603736	6.50–7.50	QBT1G	3660	—	1.2	56.9 (J+)	2340 (J)	3.6	4.1 (J+)	0.53 (UJ)	5510	—	—	251	3.1	0.78	0.0027 (J)	0.53 (U)	7.1	—
RE00-08-15416	00-603737	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	0.91	—	0.56 (U)	—	—
RE00-08-15417	00-603737	2.00–3.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	0.78	—	0.55 (U)	—	—
RE00-08-15422	00-603740	2.50–3.50	QBT1G	—	—	—	—	1940	—	—	—	—	—	—	—	—	0.2 (J)	—	0.53 (U)	—	—
RE00-08-15423	00-603740	4.00–5.00	QBT1G	—	—	—	—	—	—	—	0.53 (UJ)	—	—	—	—	2.2	13.3	0.0052 (J)	0.53 (U)	—	—
RE00-08-15424	00-603740	6.50–8.00	QBT1G	—	—	—	—	—	—	—	0.53 (UJ)	—	—	—	—	2.6	15.7	0.0057	0.53 (U)	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 9.3-3
Organic Chemicals Detected at SWMU 41-001

Sample ID	Location ID	Depth (ft)	Media	Acetone	Anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzyl Alcohol	Bis(2-ethylhexyl)phthalate	Chrysene	Di-n-butylphthalate	Fluoranthene	Indeno(1,2,3-cd)pyrene	Pyrene	Toluene
RE00-08-15392	00-603725	5.50–6.50	QBT1G	—*	—	0.13 (J)	0.13 (J)	0.072 (J)	0.083 (J)	—	—	0.058 (J)	—	—	0.063 (J)	0.064 (J)	—
RE00-08-15393	00-603725	7.50–8.50	QBT1G	—	0.048 (J)	0.25 (J)	0.27 (J)	0.14 (J)	0.1 (J)	—	—	0.074 (J)	—	—	0.15 (J)	0.068 (J)	—
RE00-08-15397	00-603727	4.00–5.00	QBT1G	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00039 (J)
RE00-08-15406	00-603732	3.50–4.50	QBT1G	—	—	—	—	—	—	—	0.072 (J)	—	—	—	—	—	—
RE00-08-15411	00-603734	4.00–5.00	QBT1G	—	—	—	—	—	—	—	0.13 (J)	—	—	—	—	—	—
RE00-08-15414	00-603736	4.50–5.50	QBT1G	—	—	—	—	—	—	0.04 (J)	—	—	—	—	—	—	—
RE00-08-15415	00-603736	6.50–7.50	QBT1G	0.004 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-08-15416	00-603737	0.00–1.00	SED	—	—	—	0.045 (J)	—	0.037 (J)	—	—	0.046 (J)	—	0.055 (J)	—	0.051 (J)	—
RE00-08-15417	00-603737	2.00–3.00	SED	—	—	—	—	—	—	0.038 (J)	—	—	—	0.037 (J)	—	—	—
0441-95-0003	41-01007	0.00–1.00	QBT2	—	—	—	—	—	—	—	—	—	0.065 (J)	—	0.36 (J)	0.051 (J)	0.009
0441-95-0004	41-01007	4.00–5.00	QBT2	—	—	—	—	—	—	—	—	—	0.079 (J)	—	—	—	0.015
0441-95-0009	41-01008	0.00–1.00	QBT2	—	—	—	—	—	—	—	—	—	0.13 (J)	0.047 (J)	—	0.049 (J)	0.011 (J+)
0441-95-0010	41-01008	4.00–5.00	QBT2	—	—	—	—	—	—	—	—	—	0.077 (J)	—	—	—	0.011
0441-95-0011	41-01008	9.00–10.00	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—	0.004 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
*— = Not detected.

Table 9.3-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 41-001

Sample ID	Location ID	Depth (ft)	Media	Plutonium-239/240	Tritium	Uranium-235/236
QBT1G Background Value[a]				**na**[b]	**na**	**0.18**
QBT2 Background Value[a]				**na**	**na**	**0.09**
SED Background Value[a]				**0.068**	**0.093**	**0.2**
RE00-08-15396	00-603727	2.00–3.00	QBT1G	—[c]	—	0.294
RE00-08-15404	00-603731	3.00–4.00	QBT1G	—	0.67	—
RE00-08-15405	00-603731	5.00–6.00	QBT1G	0.136	—	—
RE00-08-15408	00-603733	2.25–3.25	QBT1G	0.195	—	—
RE00-08-15410	00-603734	2.00–3.00	QBT1G	0.207	—	—
RE00-08-15411	00-603734	4.00–5.00	QBT1G	0.329	—	—
RE00-08-15416	00-603737	0.00–1.00	SED	0.368	—	—
RE00-08-15417	00-603737	2.00–3.00	SED	0.127	—	—
RE00-08-15422	00-603740	2.50–3.50	QBT1G	—	1.02	0.187
0441-95-0003	41-01007	0.00–1.00	QBT2	0.033	0.191943	—
0441-95-0004	41-01007	4.00–5.00	QBT2	0.034	0.204956	—
0441-95-0009	41-01008	0.00–1.00	QBT2	0.036	0.192402	—
0441-95-0010	41-01008	4.00–5.00	QBT2	—	0.187058	—
0441-95-0011	41-01008	9.00–10.00	QBT2	—	0.118648	—

Notes: Results are in pCi/g.

[a] BVs/FVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV/FV.

Table 10.3-1
Samples Collected and Analyses Requested at AOC 43-001(b2)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins and Furans	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-09-385	00-604264	0.00–1.00	SED	09-670	09-669	09-667	09-670	09-670	09-670	09-670	09-669	09-668	09-669	09-670	09-668	09-668	09-669
RE00-09-386	00-604264	2.00–3.00	QBT3	09-670	09-669	09-667	09-670	09-670	09-670	09-670	09-669	09-668	09-669	09-670	09-668	09-668	09-669
RE00-09-387	00-604265	0.00–1.00	SED	09-670	09-669	09-667	09-670	09-670	09-670	09-670	09-669	09-668	09-669	09-670	09-668	09-668	09-669
RE00-09-388	00-604265	1.50–2.50	QBT3	09-670	09-669	09-667	09-670	09-670	09-670	09-670	09-669	09-668	09-669	09-670	09-668	09-668	09-669
RE00-09-389	00-604266	0.00–1.00	SED	09-670	09-669	09-667	09-670	09-670	09-670	09-670	09-669	09-668	09-669	09-670	09-668	09-668	09-669
RE00-09-390	00-604266	3.25–4.25	QBT3	09-670	09-669	09-667	09-670	09-670	09-670	09-670	09-669	09-668	09-669	09-670	09-668	09-668	09-669
RE00-09-391	00-604267	0.00–1.00	SED	09-670	09-669	09-667	09-670	09-670	09-670	09-670	09-669	09-668	09-669	09-670	09-668	09-668	09-669
RE00-09-392	00-604267	1.00–2.00	QBT3	09-670	09-669	09-667	09-670	09-670	09-670	09-670	09-669	09-668	09-669	09-670	09-668	09-668	09-669
RE00-09-393	00-604268	0.00–1.00	SED	09-692	09-691	09-689	09-692	09-692	09-692	09-692	09-691	09-690	09-691	09-692	09-690	09-690	09-691
RE00-09-394	00-604268	1.00–2.00	QBT2	09-692	09-691	09-689	09-692	09-692	09-692	09-692	09-691	09-690	09-691	09-692	09-690	09-690	09-691
RE00-09-395	00-604269	0.00–1.00	SED	09-692	09-691	09-689	09-692	09-692	09-692	09-692	09-691	09-690	09-691	09-692	09-690	09-690	09-691
RE00-09-396	00-604269	1.00–2.00	QBT2	09-692	09-691	09-689	09-692	09-692	09-692	09-692	09-691	09-690	09-691	09-692	09-690	09-690	09-691
RE00-09-397	00-604270	0.00–1.00	SED	09-692	09-691	09-689	09-692	09-692	09-692	09-692	09-691	09-690	09-691	09-692	09-690	09-690	09-691
RE00-09-398	00-604270	1.00–2.00	QBT2	09-692	09-691	09-689	09-692	09-692	09-692	09-692	09-691	09-690	09-691	09-692	09-690	09-690	09-691
RE00-09-399	00-604271	0.00–1.00	SED	09-692	09-691	09-689	09-692	09-692	09-692	09-692	09-691	09-690	09-691	09-692	09-690	09-690	09-691
RE00-09-400	00-604271	1.00–2.00	QBT2	09-692	09-691	09-689	09-692	09-692	09-692	09-692	09-691	09-690	09-691	09-692	09-690	09-690	09-691
RE00-09-401	00-604272	0.00–1.00	SED	09-692	09-691	09-689	09-692	09-692	09-692	09-692	09-691	09-690	09-691	09-692	09-690	09-690	09-691
RE00-09-402	00-604272	1.50–2.50	QBT2	09-692	09-691	09-689	09-692	09-692	09-692	09-692	09-691	09-690	09-691	09-692	09-690	09-690	09-691
RE00-09-403	00-604273	0.00–1.00	SED	09-692	09-691	09-689	09-692	09-692	09-692	09-692	09-691	09-690	09-691	09-692	09-690	09-690	09-691
RE00-09-404	00-604273	1.00–2.50	QBT2	09-692	09-691	09-689	09-692	09-692	09-692	09-692	09-691	09-690	09-691	09-692	09-690	09-690	09-691
RE00-09-409	00-604276	0.00–1.00	SED	09-670	09-669	09-667	09-670	09-670	09-670	09-670	09-669	09-668	09-669	09-670	09-668	09-668	09-669
RE00-09-410	00-604276	1.50–2.50	QBT3	09-670	09-669	09-667	09-670	09-670	09-670	09-670	09-669	09-668	09-669	09-670	09-668	09-668	09-669
RE00-09-411	00-604276	4.00–5.00	QBT3	09-670	09-669	09-667	09-670	09-670	09-670	09-670	09-669	09-668	09-669	09-670	09-668	09-668	09-669

Note: Numbers in analyte columns are request numbers.

Table 10.3-2
Inorganic Chemicals above BVs at AOC 43-001(b2)

Sample ID	Location ID	Depth (ft)	Media	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Cyanide (Total)	Lead	Nickel	Nitrate	Selenium	Zinc
SED Background Value[a]				**3.98**	**127**	**1.31**	**0.4**	**10.5**	**11.2**	**0.82**	**19.7**	**9.38**	**na[b]**	**0.3**	**60.2**
QBT2, QBT3 Background Value[a]				**2.79**	**46**	**1.21**	**1.63**	**7.14**	**4.66**	**0.5**	**11.2**	**6.58**	**na**	**0.3**	**63.5**
RE00-09-385	00-604264	0.00–1.00	SED	—[c]	—	—	—	—	—	—	30.1	—	0.65 (J+)	0.6 (U)	—
RE00-09-386	00-604264	2.00–3.00	QBT3	—	—	—	—	9.1	—	0.57 (J-)	18	—	0.58 (J+)	0.6 (U)	—
RE00-09-387	00-604265	0.00–1.00	SED	—	—	—	—	11.5	13.4	—	26	—	0.56 (J+)	0.67 (U)	115 (J-)
RE00-09-388	00-604265	1.50–2.50	QBT3	—	—	—	—	—	—	0.73 (UJ)	—	—	0.12 (J+)	0.73 (U)	—
RE00-09-389	00-604266	0.00–1.00	SED	—	—	—	—	—	—	0.99 (J-)	58.1	—	0.38 (J+)	—	84.5
RE00-09-390	00-604266	3.25–4.25	QBT3	2.9	—	—	—	—	—	0.73 (UJ)	—	—	—	—	—
RE00-09-391	00-604267	0.00–1.00	SED	—	—	—	—	10.7	—	6.9 (J-)	35.5	—	0.2 (J)	—	147 (J-)
RE00-09-392	00-604267	1.00–2.00	QBT3	2.8	81.1 (J)	—	—	10.7	5.3	—	—	7.2	0.41 (J+)	0.69 (U)	—
RE00-09-393	00-604268	0.00–1.00	SED	—	—	1.5 (J-)	—	—	—	3.1 (J-)	—	—	—	—	—
RE00-09-394	00-604268	1.00–2.00	QBT2	—	—	1.3 (J-)	—	7.8 (J-)	—	—	—	—	—	0.31 (J)	—
RE00-09-395	00-604269	0.00–1.00	SED	—	—	—	—	—	—	—	40.2	—	—	—	87.2 (J+)
RE00-09-396	00-604269	1.00–2.00	QBT2	—	—	—	—	—	6	—	33.6	—	—	—	74.9 (J+)
RE00-09-397	00-604270	0.00–1.00	SED	—	—	—	—	—	—	2.5 (J-)	20.2	—	1.8	0.6 (U)	106 (J+)
RE00-09-398	00-604270	1.00–2.00	QBT2	—	—	—	—	—	—	0.6 (J-)	—	—	0.43	—	—
RE00-09-399	00-604271	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	1.3	—	—
RE00-09-400	00-604271	1.00–2.00	QBT2	—	—	—	—	12.2 (J-)	—	—	—	—	0.27	—	—
RE00-09-401	00-604272	0.00–1.00	SED	—	—	—	0.47	29.1 (J-)	—	—	117	12	—	—	117 (J+)
RE00-09-402	00-604272	1.50–2.50	QBT2	—	—	—	—	7.5 (J-)	6.4	0.53 (UJ)	37.6	—	—	0.32 (J)	65.1 (J+)
RE00-09-403	00-604273	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	1.1	—	77.3 (J+)
RE00-09-404	00-604273	1.00–2.50	QBT2	—	—	—	—	8.8 (J-)	—	0.59 (UJ)	—	—	0.41	—	—
RE00-09-409	00-604276	0.00–1.00	SED	—	—	—	—	—	—	0.84 (J-)	47.2	—	1.5 (J+)	0.62 (U)	120 (J-)
RE00-09-410	00-604276	1.50–2.50	QBT3	—	—	—	—	—	—	0.72 (UJ)	12.7	—	0.25 (J+)	0.73 (U)	—
RE00-09-411	00-604276	4.00–5.00	QBT3	—	—	—	—	—	—	0.63 (UJ)	—	—	0.18 (J+)	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 10.3-3
Organic Chemicals Detected at AOC 43-001(b2)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Carbon Disulfide	Chrysene	Di-n-octylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Dichlorobenzene[1,3-]
RE00-09-385	00-604264	0.00–1.00	SED	0.38 (J)	0.66	—*	0.015 (J)	1.3	1.1	0.9	0.42	1.1	—	—	—	1.3	—	0.17 (J)	0.17 (J)	—
RE00-09-386	00-604264	2.00–3.00	QBT3	0.072 (J)	0.15 (J)	—	—	0.36 (J)	0.33 (J)	0.27 (J)	0.16 (J)	0.32 (J)	0.34 (J)	—	—	0.38 (J)	—	—	—	—
RE00-09-387	00-604265	0.00–1.00	SED	0.25 (J)	0.26 (J)	—	0.021 (J)	0.46	0.42 (J)	0.34 (J)	0.24 (J)	0.38 (J)	0.059 (J)	—	—	0.52	—	—	0.13 (J)	—
RE00-09-388	00-604265	1.50–2.50	QBT3	—	—	—	0.0044 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-389	00-604266	0.00–1.00	SED	0.62 (J-)	0.72 (J-)	—	0.031 (J)	1.5 (J-)	1.3 (J-)	1.3 (J-)	0.72 (J-)	1.2 (J-)	0.12 (J-)	—	—	1.6 (J-)	—	0.27 (J-)	0.34 (J-)	—
RE00-09-390	00-604266	3.25–4.25	QBT3	—	—	—	—	—	—	—	—	—	—	—	0.0005 (J)	0.05 (J)	—	—	—	—
RE00-09-391	00-604267	0.00–1.00	SED	0.23 (J)	0.48	0.012 (J)	0.014 (J)	2.5	2.6 (J)	2.7 (J)	1.1 (J)	3 (J)	0.22 (J)	—	—	3	0.066 (J)	—	0.12 (J)	0.00025 (J)
RE00-09-392	00-604267	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	0.071 (J)	—	—	—	—	—	—	—
RE00-09-393	00-604268	0.00–1.00	SED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-394	00-604268	1.00–2.00	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-395	00-604269	0.00–1.00	SED	—	—	—	—	0.11 (J)	0.13 (J)	0.13 (J)	0.08 (J)	0.13 (J)	0.063 (J)	—	—	0.13 (J)	—	—	—	—
RE00-09-396	00-604269	1.00–2.00	QBT2	0.045 (J)	0.072 (J)	—	—	0.14 (J)	0.15 (J)	0.13 (J)	0.09 (J)	0.15 (J)	0.052 (J)	—	—	0.17 (J)	—	—	—	—
RE00-09-397	00-604270	0.00–1.00	SED	0.15 (J)	0.3 (J)	—	0.014 (J)	0.84	0.82	0.81	0.28 (J)	0.81	0.33 (J)	0.059 (J)	—	0.9	—	0.11 (J)	0.069 (J)	—
RE00-09-398	00-604270	1.00–2.00	QBT2	—	—	—	—	—	—	—	—	—	0.63	—	—	—	—	—	—	—
RE00-09-399	00-604271	0.00–1.00	SED	—	—	—	—	0.15 (J)	0.17 (J)	0.16 (J)	0.088 (J)	0.16 (J)	0.11 (J)	0.3 (J)	—	0.17 (J)	—	—	—	—
RE00-09-400	00-604271	1.00–2.00	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-401	00-604272	0.00–1.00	SED	1	0.99	—	0.083	1.5	1.4	1.2	0.75	1.5	0.059 (J)	0.064 (J)	—	1.7	—	0.28 (J)	0.49	—
RE00-09-402	00-604272	1.50–2.50	QBT2	—	0.037 (J)	—	—	0.099 (J)	0.12 (J)	0.11 (J)	0.077 (J)	0.12 (J)	0.047 (J)	—	—	0.12 (J)	—	—	—	—
RE00-09-403	00-604273	0.00–1.00	SED	—	—	—	0.0083 (J)	0.15 (J)	0.16 (J)	0.17 (J)	0.066 (J)	0.17 (J)	0.75	—	—	0.17 (J)	—	—	—	—
RE00-09-404	00-604273	1.00–2.50	QBT2	—	—	—	0.0054 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-409	00-604276	0.00–1.00	SED	0.55 (J-)	1.9 (J-)	—	0.02 (J)	5.7 (J-)	5.6 (J-)	6.2 (J-)	2.5 (J-)	5.5 (J-)	0.11 (J-)	—	—	6 (J-)	—	0.96 (J-)	0.3 (J-)	—
RE00-09-410	00-604276	1.50–2.50	QBT3	0.25 (J)	0.65	—	0.0099 (J)	2.1	2.1 (J)	2 (J)	1.1 (J)	2.1 (J)	—	—	—	2.1	—	—	0.13 (J)	—
RE00-09-411	00-604276	4.00–5.00	QBT3	—	—	—	—	0.11 (J)	0.11 (J)	0.099 (J)	0.11 (J)	0.1 (J)	—	—	—	0.12 (J)	—	—	—	—

Table 10.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)
RE00-09-385	00-604264	0.00–1.00	SED	3.2	0.37 (J)	0.0000304	0.0000607	0.00000468 (J)	0.000000506 (J)	0.0000171	0.000000299 (J)	0.000000911 (J)	0.000000473 (J)	0.00000577
RE00-09-386	00-604264	2.00–3.00	QBT3	0.88	0.07 (J)	0.00000453	0.00000899	—	—	0.00000218 (J)	—	—	—	0.000000899
RE00-09-387	00-604265	0.00–1.00	SED	1.4	0.24 (J)	0.000139	0.000288	0.0000123	0.00000131 (J)	0.0000513	0.000000701 (J)	0.00000253 (J)	0.000000948 (J)	0.0000151
RE00-09-388	00-604265	1.50–2.50	QBT3	—	—	0.0000205	0.0000409	0.00000189 (J)	0.000000251 (J)	0.00000757 (J)	—	0.000000451 (J)	0.000000162 (J)	0.00000237
RE00-09-389	00-604266	0.00–1.00	SED	3.4 (J-)	0.5 (J-)	0.0000562	0.000106	0.00000943 (J)	0.000000981 (J)	0.0000279	0.00000059 (J)	0.00000207 (J)	0.00000118 (J)	0.0000134
RE00-09-390	00-604266	3.25–4.25	QBT3	0.084 (J)	—	0.0000138	0.0000275	0.00000157 (J)	0.000000172 (J)	0.00000693 (J)	0.000000203 (J)	0.000000449 (J)	0.000000204 (J)	0.00000314
RE00-09-391	00-604267	0.00–1.00	SED	6.3	0.26 (J)	0.0000632	0.000121	0.00000743 (J)	0.000000726 (J)	0.0000299	0.000000527 (J)	0.00000184 (J)	0.000000794 (J)	0.0000111
RE00-09-392	00-604267	1.00–2.00	QBT3	—	—	0.00000132 (J)	0.00000268	—	0.000000223 (J)	—	—	—	—	—
RE00-09-393	00-604268	0.00–1.00	SED	—	—	0.00000884	0.000016	0.00000109 (J)	—	0.0000039 (J)	—	0.000000296 (J)	—	0.00000165
RE00-09-394	00-604268	1.00–2.00	QBT2	—	—	0.000000884 (J)	0.00000153	—	—	—	—	—	—	—
RE00-09-395	00-604269	0.00–1.00	SED	0.25 (J)	—	0.0000849	0.000157	0.0000123	0.00000119 (J)	0.000047	0.000000901 (J)	0.00000317	0.00000143 (J)	0.0000175
RE00-09-396	00-604269	1.00–2.00	QBT2	0.36 (J)	0.044 (J)	0.000404	0.000719	0.0000411	0.00000344	0.000204	0.00000209 (J)	0.0000135	0.0000042	0.0000603
RE00-09-397	00-604270	0.00–1.00	SED	1.9	0.16 (J)	0.0000453	0.0000869	0.00000717 (J)	0.000000624 (J)	0.000026	0.000000531 (J)	0.00000181 (J)	0.000000802 (J)	0.000011
RE00-09-398	00-604270	1.00–2.00	QBT2	0.049 (J)	—	0.00000747	0.0000145	0.00000121 (J)	—	0.00000449 (J)	—	—	—	0.00000129
RE00-09-399	00-604271	0.00–1.00	SED	0.28 (J)	—	0.0000351	0.0000668	0.00000457 (J)	—	0.0000174	—	0.00000112 (J)	—	0.00000569
RE00-09-400	00-604271	1.00–2.00	QBT2	0.045 (J)	—	0.0000154	0.0000299	0.00000204 (J)	—	0.00000897 (J)	—	—	—	0.00000065
RE00-09-401	00-604272	0.00–1.00	SED	4.7	0.84	0.000596	0.00112	0.0000764	0.00000717	0.00036	0.00000393	0.0000213	0.00000641	0.000102
RE00-09-402	00-604272	1.50–2.50	QBT2	0.25 (J)	—	0.000172	0.000319	0.0000226	0.00000197 (J)	0.000107	0.00000124 (J)	0.00000551	0.00000134 (J)	0.0000259
RE00-09-403	00-604273	0.00–1.00	SED	0.33 (J)	—	0.0000309	0.0000579	0.00000471 (J)	0.00000035 (J)	0.0000178	—	0.0000012 (J)	—	0.00000581
RE00-09-404	00-604273	1.00–2.50	QBT2	—	—	0.0000335	0.000066	0.00000436 (J)	—	0.0000197	—	0.000000962 (J)	—	0.00000439
RE00-09-409	00-604276	0.00–1.00	SED	15 (J-)	0.72 (J-)	0.0000431	0.0000806	0.00000794 (J)	0.000000762 (J)	0.0000235	0.000000552 (J)	0.00000183 (J)	0.00000108 (J)	0.0000123
RE00-09-410	00-604276	1.50–2.50	QBT3	4.6	0.27 (J)	0.00000713	0.0000134	0.00000125 (J)	0.000000118 (J)	0.0000036 (J)	0.000000134 (J)	0.000000532 (J)	0.000000364 (J)	0.00000554
RE00-09-411	00-604276	4.00–5.00	QBT3	0.21 (J)	—	0.00000481	0.00000935	—	—	0.00000216 (J)	—	0.000000347 (J)	0.000000244 (J)	0.00000505

Table 10.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin[1,2,3,7,8-]
RE00-09-385	00-604264	0.00–1.00	SED	0.00000041 (J)	0.00000023 (J)	—	0.000000337 (J)	0.00000647	0.43	—	0.061 (J)	0.17 (J)	0.000384	0.0000125 (J)	0.000000229 (J)
RE00-09-386	00-604264	2.00–3.00	QBT3	—	—	—	—	—	0.15 (J)	—	—	—	0.0000509	—	—
RE00-09-387	00-604265	0.00–1.00	SED	0.000000989 (J)	0.000000455 (J)	0.000000168 (J)	0.000000696 (J)	0.0000186	0.25 (J)	—	0.06 (J)	0.098 (J)	0.002	0.0000323	0.000000773 (J)
RE00-09-388	00-604265	1.50–2.50	QBT3	0.000000113 (J)	—	—	0.000000131 (J)	0.00000265 (J)	—	—	—	—	0.000289	0.00000471 (J)	—
RE00-09-389	00-604266	0.00–1.00	SED	0.00000183 (J)	0.000000686 (J)	0.00000023 (J)	0.000000891 (J)	0.0000157	0.69 (J-)	—	0.21 (J-)	0.68 (J-)	0.000549	0.0000208 (J)	0.000000473 (J)
RE00-09-390	00-604266	3.25–4.25	QBT3	0.000000286 (J)	0.000000146 (J)	—	0.000000129 (J)	0.0000029 (J)	—	—	—	—	0.000166	0.0000039 (J)	—
RE00-09-391	00-604267	0.00–1.00	SED	0.00000141 (J)	0.000000398 (J)	0.000000127 (J)	0.000000523 (J)	0.0000123	1 (J)	—	0.11 (J)	0.17 (J)	0.000737	0.0000185 (J)	0.000000368 (J)
RE00-09-392	00-604267	1.00–2.00	QBT3	—	—	—	—	—	—	0.0013 (J)	—	—	0.0000119 (J)	—	—
RE00-09-393	00-604268	0.00–1.00	SED	—	—	—	—	0.00000115	—	—	—	—	0.0000892	0.00000303 (J)	—
RE00-09-394	00-604268	1.00–2.00	QBT2	—	—	—	—	0.000000085	—	—	—	—	0.0000051	—	—
RE00-09-395	00-604269	0.00–1.00	SED	0.00000127 (J)	0.000000614 (J)	0.000000229 (J)	0.000000877 (J)	0.0000177	0.067 (J)	—	—	—	0.000886	0.0000327	0.000000669 (J)
RE00-09-396	00-604269	1.00–2.00	QBT2	0.00000114 (J)	0.000000757 (J)	0.00000034 (J)	0.00000167 (J)	0.0000492	0.082 (J)	—	—	0.04 (J)	0.00422	0.000117	0.00000101 (J)
RE00-09-397	00-604270	0.00–1.00	SED	0.000000981 (J)	0.000000396 (J)	0.000000113 (J)	0.00000045 (J)	0.00000978	0.28 (J)	—	0.05 (J)	0.081 (J)	0.000507	0.0000183	0.000000471 (J)
RE00-09-398	00-604270	1.00–2.00	QBT2	—	—	—	—	0.0000014	—	—	—	—	0.0000771	0.00000343 (J)	—
RE00-09-399	00-604271	0.00–1.00	SED	0.000000439 (J)	—	—	0.00000035 (J)	0.00000623	0.079 (J)	—	—	—	0.000406	0.0000118	—
RE00-09-400	00-604271	1.00–2.00	QBT2	—	—	—	0.000000124 (J)	0.00000158	—	—	—	—	0.000181	0.00000554	—
RE00-09-401	00-604272	0.00–1.00	SED	0.00000289	0.00000208 (J)	0.000000659 (J)	0.00000359	0.000105	0.67	—	0.29 (J+)	0.9	0.00666	0.000219	0.00000295
RE00-09-402	00-604272	1.50–2.50	QBT2	0.000000735 (J)	0.000000565 (J)	—	0.00000117 (J)	0.0000298	0.066 (J)	—	—	—	0.00203	0.0000647	0.000000811 (J)
RE00-09-403	00-604273	0.00–1.00	SED	—	—	—	—	0.00000647	0.06 (J)	—	—	—	0.000362	0.0000112	—
RE00-09-404	00-604273	1.00–2.50	QBT2	—	—	—	—	0.00000342	—	—	—	—	0.00045	0.0000121	—
RE00-09-409	00-604276	0.00–1.00	SED	0.00000205 (J)	0.000000741 (J)	0.000000203 (J)	0.000000894 (J)	0.0000158	2.4 (J-)	0.0016 (J)	0.24 (J-)	0.42 (J-)	0.000392	0.0000186 (J)	0.000000467 (J)
RE00-09-410	00-604276	1.50–2.50	QBT3	0.000000357 (J)	0.000000152 (J)	—	0.000000154 (J)	0.00000217 (J)	0.9 (J)	0.001 (J)	0.097 (J)	0.2 (J)	0.0000656	0.00000273 (J)	—
RE00-09-411	00-604276	4.00–5.00	QBT3	—	—	—	—	0.000000698 (J)	0.073 (J)	—	—	—	0.0000418 (J)	—	—

Table 10.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Styrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Trimethylbenzene[1,2,4-]
RE00-09-385	00-604264	0.00–1.00	SED	0.000000893	0.000000229 (J)	0.000000283 (J)	0.00000287	2.8	2.8	—	—	0.00000037	—	0.00000142	—
RE00-09-386	00-604264	2.00–3.00	QBT3	0.000000274	—	—	0.00000039	0.62	0.75	—	—	—	—	0.000000157	0.0006 (J)
RE00-09-387	00-604265	0.00–1.00	SED	0.0000024	0.000000365 (J)	0.000000476 (J)	0.00000597	1.5	1.2	—	—	0.0000005	—	0.00000223	—
RE00-09-388	00-604265	1.50–2.50	QBT3	0.000000121	—	—	0.000000176	—	—	—	—	—	—	—	—
RE00-09-389	00-604266	0.00–1.00	SED	0.0000034	0.00000104 (J)	0.000000693 (J)	0.0000102	3.6 (J-)	4.5 (J-)	—	—	0.00000108	0.000000651	0.00000499	—
RE00-09-390	00-604266	3.25–4.25	QBT3	—	0.000000188 (J)	—	0.00000131	0.05 (J)	0.072 (J)	—	—	—	—	0.000000353	—
RE00-09-391	00-604267	0.00–1.00	SED	0.0000014	0.000000522 (J)	—	0.00000523	3.7	4.8	—	—	0.000000482	—	0.00000217	—
RE00-09-392	00-604267	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-393	00-604268	0.00–1.00	SED	—	—	—	0.000000219	—	—	0.00041 (J)	—	—	—	—	—
RE00-09-394	00-604268	1.00–2.00	QBT2	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-395	00-604269	0.00–1.00	SED	0.00000314	0.000000538 (J)	0.000000592 (J)	0.00000733	0.14 (J)	0.22 (J)	—	0.000000145 (J)	0.00000186	0.000000508	0.00000352	—
RE00-09-396	00-604269	1.00–2.00	QBT2	0.0000044	0.000000264 (J)	0.000000653 (J)	0.00000981	0.32 (J)	0.32 (J)	—	—	0.000000136	—	0.00000293	—
RE00-09-397	00-604270	0.00–1.00	SED	0.00000135	0.000000497 (J)	0.000000417 (J)	0.00000454	1.3	1.5	—	—	—	—	0.00000157	—
RE00-09-398	00-604270	1.00–2.00	QBT2	—	—	—	0.000000285	—	0.043 (J)	—	—	—	—	—	—
RE00-09-399	00-604271	0.00–1.00	SED	—	—	0.000000225 (J)	0.0000023	0.15 (J)	0.25 (J)	—	—	—	—	0.000000664	—
RE00-09-400	00-604271	1.00–2.00	QBT2	—	—	—	0.00000038	—	0.041 (J)	—	—	—	—	—	—
RE00-09-401	00-604272	0.00–1.00	SED	0.00000999	0.000000742 (J)	0.00000233 (J)	0.0000313	5.4	4.1	—	0.000000401 (J)	0.00000143	0.00000131	0.0000131	—
RE00-09-402	00-604272	1.50–2.50	QBT2	0.00000196	0.00000022 (J)	0.000000923 (J)	0.0000111	0.17 (J)	0.23 (J)	—	—	—	—	0.00000364	—
RE00-09-403	00-604273	0.00–1.00	SED	—	—	—	0.00000244	0.19 (J)	0.26 (J)	—	—	0.000000375	—	0.000000255	—
RE00-09-404	00-604273	1.00–2.50	QBT2	—	—	—	0.0000011	—	—	—	—	—	—	0.000000435	—
RE00-09-409	00-604276	0.00–1.00	SED	0.00000348	0.00000143 (J)	0.00000132 (J)	0.0000148	11 (J-)	18 (J-)	—	0.000000277 (J)	0.00000151	0.00000171	0.00000925	—
RE00-09-410	00-604276	1.50–2.50	QBT3	0.00000325	0.00000266	0.00000036 (J)	0.0000054	3.1	3.8	—	—	0.00000128	—	0.00000114	—
RE00-09-411	00-604276	4.00–5.00	QBT3	0.000003	0.000000294 (J)	—	0.000000915	0.13 (J)	0.25 (J)	—	—	0.0000024	—	0.000000369	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 10.3-4
Radionuclides Detected or Detected above BVs/FVs at AOC 43-001(b2)

Sample ID	Location ID	Depth (ft)	Media	Plutonium-239/240	Uranium-235/236
QBT2 Background Value[a]				**na**[b]	**0.09**
SED Background Value[a]				**0.068**	**0.2**
RE00-09-399	00-604271	0.00–1.00	SED	—[c]	0.211
RE00-09-404	00-604273	1.00–2.50	QBT2	—	0.216
RE00-09-409	00-604276	0.00–1.00	SED	0.168	—

Note: Results are in pCi/g.

[a] BVs/FVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV/FV.

Table 10.4-1
Samples Collected and Analyses Requested at AOC C-43-001

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins and Furans	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (total)
RE00-09-426	00-604277	0.00–1.00	SED	09-674	09-673	09-671	09-674	09-674	09-674	09-674	09-673	09-672	09-673	09-674	09-672	09-672	09-673
RE00-09-427	00-604277	1.00–2.00	QBT3	09-674	09-673	09-671	09-674	09-674	09-674	09-674	09-673	09-672	09-673	09-674	09-672	09-672	09-673
RE00-09-428	00-604278	0.00–1.00	SED	09-674	09-673	09-671	09-674	09-674	09-674	09-674	09-673	09-672	09-673	09-674	09-672	09-672	09-673
RE00-09-429	00-604278	1.50–2.50	QBT3	09-674	09-673	09-671	09-674	09-674	09-674	09-674	09-673	09-672	09-673	09-674	09-672	09-672	09-673
RE00-09-430	00-604279	0.00–1.00	SED	09-674	09-673	09-671	09-674	09-674	09-674	09-674	09-673	09-672	09-673	09-674	09-672	09-672	09-673
RE00-09-431	00-604279	2.50–3.50	QBT3	09-674	09-673	09-671	09-674	09-674	09-674	09-674	09-673	09-672	09-673	09-674	09-672	09-672	09-673
RE00-09-444	00-604286	0.00–1.00	SED	09-674	09-673	09-671	09-674	09-674	09-674	09-674	09-673	09-672	09-673	09-674	09-672	09-672	09-673
RE00-09-445	00-604286	1.50–2.50	SED	09-674	09-673	09-671	09-674	09-674	09-674	09-674	09-673	09-672	09-673	09-674	09-672	09-672	09-673
RE00-09-446	00-604286	4.00–5.00	QBT3	09-674	09-673	09-671	09-674	09-674	09-674	09-674	09-673	09-672	09-673	09-674	09-672	09-672	09-673
RE00-09-5306	00-604846	0.00–1.00	SED	09-1262	09-1260	09-1265	09-1262	09-1262	09-1262	09-1262	09-1260	09-1261	09-1260	09-1262	09-1261	09-1261	09-1260
RE00-09-5307	00-604846	1.50–2.50	QBT3	09-1262	09-1260	09-1265	09-1262	09-1262	09-1262	09-1262	09-1260	09-1261	09-1260	09-1262	09-1261	09-1261	09-1260
RE00-09-5308	00-604847	0.00–1.00	SED	09-1262	09-1260	09-1265	09-1262	09-1262	09-1262	09-1262	09-1260	09-1261	09-1260	09-1262	09-1261	09-1261	09-1260
RE00-09-5309	00-604847	1.00–2.00	QBT3	09-1262	09-1260	09-1265	09-1262	09-1262	09-1262	09-1262	09-1260	09-1261	09-1260	09-1262	09-1261	09-1261	09-1260
RE00-09-5310	00-604848	0.00–1.00	SED	09-1262	09-1260	09-1265	09-1262	09-1262	09-1262	09-1262	09-1260	09-1261	09-1260	09-1262	09-1261	09-1261	09-1260
RE00-09-5311	00-604848	1.00–2.00	QBT3	09-1262	09-1260	09-1265	09-1262	09-1262	09-1262	09-1262	09-1260	09-1261	09-1260	09-1262	09-1261	09-1261	09-1260

Note: Numbers in analyte columns are request numbers.

Table 10.4-2
Inorganic Chemicals above BVs at AOC C-43-001

Sample ID	Location ID	Depth (ft)	Media	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Mercury	Nickel	Nitrate	Selenium	Silver	Vanadium	Zinc
QBT3 Background Value[a]				**2.79**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**11.2**	**0.1**	**6.58**	**na**[b]	**0.3**	**1**	**17**	**63.5**
SED Background Value[a]				**3.98**	**127**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**0.82**	**19.7**	**0.1**	**9.38**	**na**	**0.3**	**1**	**19.7**	**60.2**
RE00-09-426	00-604277	0.00–1.00	SED	—[c]	—	—	—	—	—	—	—	26.9	—	—	0.71	0.55 (U)	—	—	78 (J-)
RE00-09-427	00-604277	1.00–2.00	QBT3	—	—	—	—	8.5	—	4.9	—	14.3	0.117 (J)	—	0.2 (J)	0.32 (J+)	—	—	—
RE00-09-428	00-604278	0.00–1.00	SED	—	—	—	4670 (J-)	—	—	—	—	—	—	—	1.6	0.61 (U)	—	—	—
RE00-09-429	00-604278	1.50–2.50	QBT3	—	—	—	3430 (J-)	22	—	—	0.62 (U)	—	—	11.3	0.26	—	—	—	—
RE00-09-430	00-604279	0.00–1.00	SED	—	—	—	—	—	—	—	—	26.8	0.129 (J)	—	0.96	—	—	—	—
RE00-09-431	00-604279	2.50–3.50	QBT3	—	46.1 (J)	—	—	7.9	—	5.3	—	14.2	—	—	0.24 (J)	0.63 (U)	—	—	—
RE00-09-444	00-604286	0.00–1.00	SED	—	—	—	—	—	—	15.3	—	—	0.125 (J)	—	0.12 (J)	0.59 (U)	—	—	74.7 (J-)
RE00-09-445	00-604286	1.50–2.50	SED	4.5	—	—	—	13.1	4.9	52	1.3 (J)	60.5	0.308 (J)	—	0.19 (J)	0.41 (J+)	—	20.4	144 (J-)
RE00-09-446	00-604286	4.00–5.00	QBT3	—	—	—	—	18.6	—	9.3	—	22.5	—	10.1	0.2 (J)	0.32 (J+)	—	—	—
RE00-09-5306	00-604846	0.00–1.00	SED	—	—	0.46	—	24.3	—	13.2	—	90.7	0.242	—	0.1 (J)	0.53 (U)	—	—	125
RE00-09-5307	00-604846	1.50–2.50	QBT3	—	—	—	—	—	—	5.4	0.54 (U)	16.2	0.134	—	—	0.59 (U)	—	—	—
RE00-09-5308	00-604847	0.00–1.00	SED	—	—	0.41	—	43.5	—	17.2	—	202	0.291	—	—	0.59 (U)	1.1	—	127
RE00-09-5309	00-604847	1.00–2.00	QBT3	3.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-5310	00-604848	0.00–1.00	SED	—	—	—	—	—	—	—	—	23	—	—	0.15 (J)	0.59 (U)	—	—	—
RE00-09-5311	00-604848	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	0.19 (J)	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] — = Not detected or not detected above BV.

Table 10.4-3
Organic Chemicals Detected at AOC C-43-001

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Bromomethane	Butylbenzylphthalate
RE00-09-426	00-604277	0.00–1.00	SED	0.19 (J)	—*	—	0.31 (J)	0.035 (J)	0.019 (J)	0.97	1	1.1	0.44	1	0.082 (J)	—	—
RE00-09-427	00-604277	1.00–2.00	QBT3	0.12 (J)	—	—	0.18 (J)	0.013 (J)	0.0075 (J)	0.34 (J)	0.34 (J)	0.32 (J)	0.17 (J)	0.38 (J)	0.075 (J)	—	—
RE00-09-428	00-604278	0.00–1.00	SED	0.5	—	—	0.56	0.048 (J)	—	0.96	0.94	0.8	0.49	0.85	—	—	—
RE00-09-429	00-604278	1.50–2.50	QBT3	0.085 (J)	—	—	0.1 (J)	0.0056 (J)	0.0042 (J)	0.14 (J)	0.15 (J)	0.11 (J)	0.12 (J)	0.13 (J)	—	—	—
RE00-09-430	00-604279	0.00–1.00	SED	0.86	—	—	1.3	0.026 (J)	0.017 (J)	2.2	2.1	1.9	0.89	2.1	0.064 (J)	—	—
RE00-09-431	00-604279	2.50–3.50	QBT3	0.22 (J)	0.087 (J)	0.049	0.73	0.019 (J)	0.0097 (J)	2.8	2.8 (J)	2 (J)	1.2 (J)	3 (J)	0.08 (J)	—	—
RE00-09-444	00-604286	0.00–1.00	SED	0.43	—	—	0.79	0.022 (J)	0.027 (J)	2.3	2.2 (J)	2.5 (J)	1 (J)	2.4 (J)	0.34 (J)	—	—
RE00-09-445	00-604286	1.50–2.50	SED	0.5 (J)	—	—	0.66	0.052 (J)	0.044 (J)	1.4	1.2	1.2	0.54	1.5	—	—	—
RE00-09-446	00-604286	4.00–5.00	QBT3	0.12 (J)	—	—	0.24 (J)	—	—	0.63	0.5	0.55	0.21 (J)	0.47	—	—	—
RE00-09-5306	00-604846	0.00–1.00	SED	0.26 (J)	—	—	0.43	0.2	—	1.8	1.8	1.7	0.72	1.9	0.13 (J)	0.00064 (J)	0.06 (J)
RE00-09-5307	00-604846	1.50–2.50	QBT3	0.046 (J)	—	—	0.11 (J)	—	—	0.3 (J)	0.3 (J)	0.28 (J)	0.12 (J)	0.29 (J)	—	0.00067 (J)	—
RE00-09-5308	00-604847	0.00–1.00	SED	0.22 (J)	—	—	0.33 (J)	0.16	—	1	1	0.89	0.4	1.1	0.082 (J)	—	—
RE00-09-5309	00-604847	1.00–2.00	QBT3	—	—	—	0.04 (J)	—	—	0.16 (J)	0.14 (J)	0.13 (J)	0.087 (J)	0.12 (J)	—	—	—
RE00-09-5310	00-604848	0.00–1.00	SED	0.12 (J)	—	—	0.12 (J)	—	—	0.19 (J)	0.19 (J)	0.13 (J)	0.13 (J)	0.15 (J)	—	—	0.17 (J)
RE00-09-5311	00-604848	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.00072 (J)	—

Table 10.4-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]
RE00-09-426	00-604277	0.00–1.00	SED	1.1	0.15 (J)	0.074 (J)	2.4	0.17 (J)	0.0000298	0.0000529	0.00000469	0.000000388 (J)	0.0000128	—	0.00000123 (J)
RE00-09-427	00-604277	1.00–2.00	QBT3	0.36 (J)	—	0.052 (J)	0.94	0.12 (J)	0.0000072	0.0000133	0.00000157 (J)	—	0.00000421	—	0.000000316 (J)
RE00-09-428	00-604278	0.00–1.00	SED	1.1	—	0.2 (J)	2.4	0.4	0.00000891	0.0000171	0.0000025	0.000000241 (J)	0.00000631	—	0.000000459 (J)
RE00-09-429	00-604278	1.50–2.50	QBT3	0.16 (J)	—	—	0.37 (J)	0.07 (J)	0.000002 (J)	0.00000403	0.000000466 (J)	—	0.00000116	—	—
RE00-09-430	00-604279	0.00–1.00	SED	2.3	—	0.4	6	0.82	0.0000467	0.0000809	0.0000122	0.000000869 (J)	0.0000451	—	0.0000021 (J)
RE00-09-431	00-604279	2.50–3.50	QBT3	2.6	—	0.094 (J)	5.8	0.28 (J)	0.0000207	0.0000386	0.00000454	0.000000283 (J)	0.0000166	0.000000173 (J)	0.000000833 (J)
RE00-09-444	00-604286	0.00–1.00	SED	2.4	—	0.21 (J)	6.2	0.42	0.0000157	0.0000325	0.00000275	0.00000024 (J)	0.00000687	—	0.000000817 (J)
RE00-09-445	00-604286	1.50–2.50	SED	1.5	—	0.23 (J)	3.9	0.44 (J)	0.0000475	0.0000946	0.00000797	0.000000692 (J)	0.0000224	0.00000111 (J)	0.00000263
RE00-09-446	00-604286	4.00–5.00	QBT3	0.65	—	0.063 (J)	1.4	0.12 (J)	0.00000576	0.0000121	0.000000881 (J)	—	0.00000303	—	0.000000412 (J)
RE00-09-5306	00-604846	0.00–1.00	SED	2.1	0.27 (J)	0.11 (J)	4.6	0.24 (J)	0.0000613	0.000117	0.0000101	0.000000989 (J)	0.0000282	0.000000705 (J)	0.00000241 (J)
RE00-09-5307	00-604846	1.50–2.50	QBT3	0.32 (J)	0.051 (J)	—	0.67	0.046 (J)	0.0000163	0.0000306	0.00000396 (J)	0.000000395 (J)	0.0000101	0.000000259 (J)	0.000000786 (J)
RE00-09-5308	00-604847	0.00–1.00	SED	1.1	0.15 (J)	0.093 (J)	2.6	0.19 (J)	0.000074	0.000149	0.0000114	0.00000114 (J)	0.000033	0.00000107 (J)	0.00000278
RE00-09-5309	00-604847	1.00–2.00	QBT3	0.18 (J)	—	—	0.36 (J)	—	0.00000399	0.00000759	—	—	0.00000187 (J)	—	0.000000167 (J)
RE00-09-5310	00-604848	0.00–1.00	SED	0.2 (J)	0.04 (J)	0.047 (J)	0.49	0.1 (J)	0.00000318	0.00000633	—	—	0.00000145 (J)	—	0.000000139 (J)
RE00-09-5311	00-604848	1.00–2.00	QBT3	—	—	—	—	—	0.000000547 (J)	0.0000011	—	—	—	—	—

Table 10.4-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
RE00-09-426	00-604277	0.00–1.00	SED	—	0.00000766	0.000000849 (J)	0.000000508 (J)	—	0.000000458 (J)	0.00000904	0.41 (J)	—	—	0.079 (J)	0.000244
RE00-09-427	00-604277	1.00–2.00	QBT3	—	0.00000126	0.000000326 (J)	—	—	0.000000175 (J)	0.00000301 (J)	0.14 (J)	—	—	0.079 (J)	0.0000629
RE00-09-428	00-604278	0.00–1.00	SED	—	0.00000313	—	0.000000529 (J)	—	0.000000298 (J)	0.00000315 (J)	0.42 (J)	—	0.12 (J)	0.34 (J)	0.0000676
RE00-09-429	00-604278	1.50–2.50	QBT3	—	—	0.000000277 (J)	—	—	—	—	0.092 (J)	—	—	0.069 (J)	0.0000149 (J)
RE00-09-430	00-604279	0.00–1.00	SED	0.000000715 (J)	0.0000102	0.00000181 (J)	0.000000462 (J)	—	0.00000052 (J)	0.0000158	0.81 (J)	—	0.21 (J)	0.7	0.000435
RE00-09-431	00-604279	2.50–3.50	QBT3	—	0.00000252	0.000000915 (J)	—	—	0.000000206 (J)	0.00000527 (J)	1 (J)	0.042	0.052 (J)	0.15 (J)	0.0002
RE00-09-444	00-604286	0.00–1.00	SED	0.000000553 (J)	0.00000658	—	0.000000324 (J)	—	0.000000383 (J)	0.00000517 (J)	0.89 (J)	—	0.08 (J)	0.26 (J)	0.000134
RE00-09-445	00-604286	1.50–2.50	SED	0.00000181 (J)	0.0000213	0.00000162 (J)	0.000000782 (J)	—	0.00000104 (J)	0.0000171	0.47 (J)	0.07	0.1 (J)	0.27 (J)	0.000394
RE00-09-446	00-604286	4.00–5.00	QBT3	—	0.00000306	0.000000228 (J)	—	—	—	0.00000224 (J)	0.19 (J)	0.22	—	0.047 (J)	0.0000345
RE00-09-5306	00-604846	0.00–1.00	SED	0.00000138 (J)	0.0000184	0.00000114 (J)	0.000000885 (J)	0.000000238 (J)	0.00000116 (J)	0.0000178	0.67 (J)	—	0.045 (J)	0.1 (J)	0.000587
RE00-09-5307	00-604846	1.50–2.50	QBT3	0.000000509 (J)	0.00000582	0.000000471 (J)	0.000000375 (J)	—	0.000000577 (J)	0.00000802	0.11 (J)	—	—	—	0.000127
RE00-09-5308	00-604847	0.00–1.00	SED	0.00000198 (J)	0.0000256	0.00000144 (J)	0.00000107 (J)	0.00000028 (J)	0.00000144 (J)	0.000022	0.38 (J)	—	0.046 (J)	0.14 (J)	0.000711
RE00-09-5309	00-604847	1.00–2.00	QBT3	0.0000000899 (J)	0.00000118	0.000000108 (J)	—	—	0.0000000812 (J)	0.00000131	0.074 (J)	—	—	—	0.0000284
RE00-09-5310	00-604848	0.00–1.00	SED	0.000000117 (J)	0.00000113	—	—	—	0.000000106 (J)	0.00000106	0.11 (J)	—	—	0.082 (J)	0.0000213
RE00-09-5311	00-604848	1.00–2.00	QBT3	—	—	—	—	—	—	0.000000143	—	—	—	—	0.00000364 (J)

Table 10.4-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene
RE00-09-426	00-604277	0.00–1.00	SED	0.0000125	—	0.000000847	0.000000413 (J)	0.000000506 (J)	0.00000546	1.6	1.9	—	0.00000033	—	0.00000169	—
RE00-09-427	00-604277	1.00–2.00	QBT3	0.00000386 (J)	—	—	—	—	0.000000981	0.73	0.71	—	0.000000161	—	—	—
RE00-09-428	00-604278	0.00–1.00	SED	0.00000615	—	—	0.0000005 (J)	0.000000344 (J)	0.00000288	2.6	2.3	—	—	—	0.00000035	—
RE00-09-429	00-604278	1.50–2.50	QBT3	0.00000106 (J)	—	—	—	—	—	0.41	0.43	—	—	—	—	—
RE00-09-430	00-604279	0.00–1.00	SED	0.0000296	—	0.000000549	0.000000829 (J)	0.000000514 (J)	0.00000529	5.3	4.7	—	—	—	0.00000125	—
RE00-09-431	00-604279	2.50–3.50	QBT3	0.0000122	—	0.00000058	0.000000363 (J)	0.000000223 (J)	0.00000246	2.8	5	—	—	—	0.00000028	—
RE00-09-444	00-604286	0.00–1.00	SED	0.00000645	—	0.000000405	0.000000341 (J)	0.000000383 (J)	0.00000349	3.8	4.3	0.000000123 (J)	0.000000123	—	0.00000235	—
RE00-09-445	00-604286	1.50–2.50	SED	0.000018	—	0.00000313	0.00000109 (J)	0.00000148 (J)	0.0000182	3.2	3	—	0.000000239	0.00000109	0.0000121	0.00063 (J)
RE00-09-446	00-604286	4.00–5.00	QBT3	0.00000202 (J)	—	—	—	—	0.00000198	1.2	1.3	—	—	—	0.00000112	—
RE00-09-5306	00-604846	0.00–1.00	SED	0.000025	0.000000434 (J)	0.00000376	0.000000316 (J)	0.00000102 (J)	0.0000131	2.5	3.3	0.000000337 (J)	0.0000016	0.000000877	0.0000102	—
RE00-09-5307	00-604846	1.50–2.50	QBT3	0.00000898	0.000000162 (J)	0.000000669	0.000000152 (J)	0.000000571 (J)	0.00000758	0.42	0.5	—	—	—	0.00000482	—
RE00-09-5308	00-604847	0.00–1.00	SED	0.0000271	0.000000596 (J)	0.00000457	0.000000401 (J)	0.00000128 (J)	0.0000172	1.6	1.8	0.000000268 (J)	0.00000141	0.00000112	0.0000121	—
RE00-09-5309	00-604847	1.00–2.00	QBT3	0.00000183 (J)	—	—	—	0.000000112 (J)	0.00000103	0.2 (J)	0.3 (J)	—	—	—	0.000000522	—
RE00-09-5310	00-604848	0.00–1.00	SED	0.00000142 (J)	—	9.45E-08	0.000000104 (J)	0.000000252 (J)	0.00000146	0.5	0.43	—	—	—	0.00000103	—
RE00-09-5311	00-604848	1.00–2.00	QBT3	0.000000336 (J)	—	—	—	—	8.76E-08	—	—	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

* — = Not detected.

Table 10.4-4
Radionuclides Detected or Detected above BVs/FVs at AOC C-43-001

Sample ID	Location ID	Depth (ft)	Media	Tritium
QBT3 Background Value				**na***
RE00-09-429	00-604278	1.50–2.50	QBT3	1.71

Note: Results are in pCi/g.
* na = Not available.

Table 11.3-1
Samples Collected and Analyses Requested at SWMU 61-007

Sample ID	Location ID	Depth (ft)	Media	PCBs	SVOCs	VOCs
RE00-09-459	00-604287	0.50–1.50	FILL	09-803	09-803	09-803
RE00-09-460	00-604287	4.50–5.50	FILL	09-803	09-803	09-803
RE00-09-461	00-604287	9.50–10.50	FILL	09-803	09-803	09-803
RE00-09-462	00-604287	14.50–15.50	QBT3	09-803	09-803	09-803
RE00-09-463	00-604287	17.00–17.50	QBT3	09-803	09-803	09-803
RE00-09-465	00-604288	0.50–1.50	FILL	09-803	09-803	09-803
RE00-09-466	00-604288	4.50–5.50	QBT3	09-803	09-803	09-803
RE00-09-471	00-604289	0.50–1.50	FILL	09-803	09-803	09-803
RE00-09-472	00-604289	4.50–5.50	FILL	09-803	09-803	09-803
RE00-09-473	00-604289	9.50–10.50	FILL	09-803	09-803	09-803
RE00-09-474	00-604289	14.00–15.00	FILL	09-803	09-803	09-803
RE00-09-477	00-604290	0.50–1.50	FILL	09-803	09-803	09-803
RE00-09-478	00-604290	4.50–5.50	FILL	09-803	09-803	09-803
RE00-09-479	00-604290	9.50–10.50	FILL	09-803	09-803	09-803
RE00-09-480	00-604290	14.50–15.50	FILL	09-803	09-803	09-803
RE00-09-481	00-604290	31.50–32.50	FILL	09-803	09-803	09-803
RE00-09-483	00-604291	2.75–3.75	FILL	09-825	09-825	09-841
RE00-09-484	00-604291	7.75–8.75	FILL	09-825	09-825	09-841
RE00-09-485	00-604291	12.75–13.75	FILL	09-825	09-825	09-841
RE00-09-486	00-604532	0.50–1.50	FILL	09-825	09-825	09-841
RE00-09-487	00-604532	4.50–5.50	FILL	09-825	09-825	09-841
RE00-09-488	00-604532	5.75–6.75	QBT3	09-825	09-825	09-841

Note: Numbers in analyte columns are request numbers.

Table 11.3-2
Organic Chemicals Detected at SWMU 61-007

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzyl Alcohol	Bis(2-ethylhexyl)phthalate	Butanone[2-]	Chrysene
RE00-09-459	00-604287	0.50–1.50	FILL	0.061 (J)	—*	0.09 (J)	0.9	0.27 (J)	0.29 (J)	0.24 (J)	0.13 (J)	0.3 (J)	—	—	—	0.3 (J)
RE00-09-460	00-604287	4.50–5.50	FILL	—	—	—	560	—	—	—	—	—	—	—	—	—
RE00-09-461	00-604287	9.50–10.50	FILL	—	—	—	12	—	—	—	—	—	—	—	—	—
RE00-09-462	00-604287	14.50–15.50	QBT3	—	—	—	5.4	—	—	—	—	—	—	—	—	—
RE00-09-463	00-604287	17.00–17.50	QBT3	—	—	—	18	—	—	—	—	—	—	—	—	—
RE00-09-465	00-604288	0.50–1.50	FILL	0.091 (J)	—	0.14 (J)	0.26	0.31 (J)	0.31 (J)	0.27 (J)	0.14 (J)	0.28 (J)	—	—	—	0.33 (J)
RE00-09-466	00-604288	4.50–5.50	QBT3	—	—	—	0.051	—	—	—	—	—	—	—	—	—
RE00-09-471	00-604289	0.50–1.50	FILL	0.046 (J)	—	0.075 (J)	0.52	0.19 (J)	0.19 (J)	0.14 (J)	0.12 (J)	0.18 (J)	—	0.07 (J)	—	0.22 (J)
RE00-09-472	00-604289	4.50–5.50	FILL	—	—	—	700	0.1 (J)	0.12 (J)	0.12 (J)	0.04 (J)	0.12 (J)	—	—	—	0.13 (J)
RE00-09-473	00-604289	9.50–10.50	FILL	—	—	—	4.2	—	—	—	—	—	—	—	—	—
RE00-09-474	00-604289	14.00–15.00	FILL	—	0.15	—	14	—	—	—	—	—	—	—	—	—
RE00-09-477	00-604290	0.50–1.50	FILL	0.21 (J)	—	0.25 (J)	1.1	0.5	0.52	0.48	0.23 (J)	0.49	—	—	—	0.56
RE00-09-478	00-604290	4.50–5.50	FILL	—	—	—	0.84	—	—	—	—	—	—	—	—	—
RE00-09-479	00-604290	9.50–10.50	FILL	—	—	—	0.25	—	—	—	—	—	—	—	—	—
RE00-09-480	00-604290	14.50–15.50	FILL	—	—	—	0.31	—	—	—	—	—	—	0.1 (J)	—	—
RE00-09-481	00-604290	31.50–32.50	FILL	—	0.91 (J-)	—	—	—	—	—	—	—	—	—	0.029 (J)	—
RE00-09-483	00-604291	2.75–3.75	FILL	—	—	—	1200	—	—	—	—	—	0.045 (J)	—	—	—
RE00-09-484	00-604291	7.75–8.75	FILL	—	—	—	4	—	—	—	—	—	0.045 (J)	—	—	—
RE00-09-485	00-604291	12.75–13.75	FILL	—	0.00498 (J)	—	7.5	—	—	—	—	—	0.041 (J)	0.065 (J)	—	—
RE00-09-486	00-604532	0.50–1.50	FILL	—	0.00479 (J)	—	1.9	0.058 (J)	0.061 (J)	0.052 (J)	0.054 (J)	0.052 (J)	0.047 (J)	0.079 (J)	—	0.073 (J)
RE00-09-487	00-604532	4.50–5.50	FILL	—	—	—	0.21	—	—	—	—	—	0.064 (J)	—	—	—
RE00-09-488	00-604532	5.75–6.75	QBT3	—	—	—	0.46	—	—	—	—	—	0.043 (J)	—	—	—

Table 11.3-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenzofuran	Dichlorobenzene[1,2-]	Fluoranthene	Fluorene	Hexachlorobenzene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Tetrachloroethene	Toluene	Trichlorobenzene[1,2,4-]
RE00-09-459	00-604287	0.50–1.50	FILL	—	—	0.69	0.043 (J)	—	0.13 (J)	—	—	0.45	0.58	—	—	—
RE00-09-460	00-604287	4.50–5.50	FILL	—	0.0083	—	—	0.49	—	—	—	—	—	—	—	—
RE00-09-461	00-604287	9.50–10.50	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-462	00-604287	14.50–15.50	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-463	00-604287	17.00–17.50	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.048 (J)
RE00-09-465	00-604288	0.50–1.50	FILL	—	—	0.8	0.072 (J)	—	0.14 (J)	—	—	0.62	0.67	—	—	—
RE00-09-466	00-604288	4.50–5.50	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-471	00-604289	0.50–1.50	FILL	—	—	0.48	—	—	0.099 (J)	—	—	0.34 (J)	0.45	0.00075 (J)	—	—
RE00-09-472	00-604289	4.50–5.50	FILL	—	—	0.18 (J)	—	0.6	—	—	—	0.11 (J)	0.15 (J)	—	—	—
RE00-09-473	00-604289	9.50–10.50	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-474	00-604289	14.00–15.00	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-477	00-604290	0.50–1.50	FILL	0.093 (J)	—	1.4	0.17 (J)	—	0.21 (J)	0.049 (J)	0.15 (J)	1.2	1.1	—	—	—
RE00-09-478	00-604290	4.50–5.50	FILL	—	—	0.075 (J)	—	—	—	—	—	0.041 (J)	0.063 (J)	—	—	—
RE00-09-479	00-604290	9.50–10.50	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-480	00-604290	14.50–15.50	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-481	00-604290	31.50–32.50	FILL	—	—	—	—	—	—	—	—	—	—	—	0.00044 (J)	—
RE00-09-483	00-604291	2.75–3.75	FILL	—	—	—	—	1.2 (J)	—	—	—	—	—	0.000895 (J)	—	—
RE00-09-484	00-604291	7.75–8.75	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-485	00-604291	12.75–13.75	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-486	00-604532	0.50–1.50	FILL	—	—	0.16 (J)	—	—	—	—	—	0.11 (J)	0.14 (J)	—	—	—
RE00-09-487	00-604532	4.50–5.50	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE00-09-488	00-604532	5.75–6.75	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 13.0-1
Summary of Investigation Results and Recommendations

SWMU/AOC	Site Description	Extent Defined?	Potential Unacceptable Risk?	Recommendation
TA-00				
SWMU 00-017	Waste lines	No	n/a*	Additional extent sampling
AOC 00-031(a)	Soil contamination beneath former service station	Yes	No	No further action
TA-01				
SWMU 01-001(a)	Septic tank 134	No	n/a	Additional extent sampling
SWMU 01-001(b)	Septic tank 135	Yes	No	No further action
SWMU 01-001(c)	Septic tank 137	Yes	No	No further action
SWMU 01-001(d)	Septic tank 138	No	n/a	Soil removal, additional extent and confirmation sampling
SWMU 01-001(e)	Septic tank 139	Yes	No	No further action
SWMU 01-001(f)	Septic tank 140	No	n/a	Soil removal, additional extent and confirmation sampling
SWMU 01-001(g)	Septic tank 141	No	n/a	Additional extent sampling
SWMU 01-001(o)	Sanitary waste line	No	n/a	Soil removal, additional extent and confirmation sampling
SWMU 01-001(s)	Western sanitary waste line, main line	No	n/a	Additional extent sampling
SWMU 01-001(t)	Eastern sanitary waste line	Yes	No	No further action
SWMU 01-001(u)	Western sanitary waste line, branch line	Yes	No	No further action
SWMU 01-002	Industrial waste line	Yes	No	No further action
SWMU 01-003(a)	Bailey Bridge landfill	No	n/a	Soil removal, additional extent and confirmation sampling
SWMU 01-003(b)	Surface disposal area	No	n/a	Additional extent sampling
SWMU 01-003(d)	Surface disposal site – can dump site	No	n/a	Additional extent sampling
SWMU 01-003(e)	Surface disposal site southeast of Los Alamos Inn	Yes	No	No further action
SWMU 01-006(a)	Cooling tower drainline and outfall	No	n/a	Additional extent sampling
SWMU 01-006(b)	Drainline and outfall	No	n/a	Soil removal, additional extent and confirmation sampling
SWMU 01-006(c)	Drainlines and outfalls	No	n/a	Additional extent sampling
SWMU 01-006(d)	Drainline and outfall	Yes	No	No further action
AOC 01-006(e)	Drainlines and outfalls to Ashley Pond	No	n/a	Additional extent sampling
AOC 01-006(g)	Stormwater drainage system	Yes	No	No further action
SWMU 01-006(h)	Stormwater drainage system	No	n/a	Soil removal, additional extent and confirmation sampling
SWMU 01-006(n)	Stormwater drainage system	No	n/a	Additional extent sampling
SWMU 01-006(o)	Stormwater drainage system	Yes	No	No further action
SWMU 01-007(a)	Suspected subsurface soil radiological contamination	No	n/a	Additional extent sampling
SWMU 01-007(b)	Suspected subsurface soil radiological contamination	No	n/a	Additional extent sampling
SWMU 01-007(c)	Suspected subsurface soil radiological contamination	No	n/a	Additional extent sampling
SWMU 01-007(d)	Suspected subsurface soil radiological contamination	Yes	No	No further action
SWMU 01-007(e)	Suspected subsurface soil radiological contamination	Yes	No	No further action
SWMU 01-007(j)	12 Areas of suspected subsurface soil radiological contamination	Yes	No	No further action
AOC 01-007(k)	Soil contamination area	Yes	No	No further action

Table 13.0-1 (continued)

SWMU/AOC	Site Description	Extent Defined?	Potential Unacceptable Risk?	Recommendation
TA-03				
SWMU 03-009(j)	Surface disposal site	Yes	No	No further action
SWMU 03-038(a) SWMU 03-038(b)	Acid tank Acid tank	No	n/a	Additional extent sampling
SWMU 03-055(c)	Outfall	No	n/a	Additional extent sampling
TA-32				
SWMU 32-001	Incinerator (former location)	Yes	No	No further action
SWMU 32-002(a)	Septic tank (former location); drainlines	No	n/a	Soil removal, additional extent and confirmation sampling
SWMU 32-002(b)	Septic system	No	n/a	Additional extent sampling
AOC 32-003	Transformer site (former location)	No	n/a	Soil removal, additional extent and confirmation sampling
AOC 32-004	Drainline and outfall	Yes	Yes	Additional sampling, potential soil removal
TA-41				
SWMU 41-001	Septic system	Yes	No	No further action
TA-43				
AOC 43-001(b2)	Outfall	Yes	No	No further action
AOC C-43-001	Storm drain outfall	No	n/a	Additional extent sampling
TA-61				
SWMU 61-007	Transformer site – systematic leak – PCB-only site	No	n/a	Soil removal, additional extent and confirmation sampling

*n/a = Not applicable.

Appendix A

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

A-1.0 ACRONYMS AND ABBREVIATIONS

%D	percent difference
%R	percent recovery
%RSD	percent relative standard deviation
AES	atomic emission spectroscopy
AK	acceptable knowledge
ALARA	as low as reasonably achievable
AOC	area of concern
AR	air rotary
ATSDR	Agency for Toxic Substances and Disease Registry
AUF	area use factors
bgs	below ground surface
B Division	Bioscience Division
BH	borehole
BMP	best management practice
BV	background value
CCB	continuing calibration blank
CCV	continuing calibration verification
CMR	Chemistry and Metallurgy Research (building)
COC	chain of custody
Consent Order	Compliance Order on Consent
COPEC	chemical of potential ecological concern
COPC	chemical of potential concern
CRDL	contract-required detection limit
CSM	conceptual site model
CST	Chemical Sciences and Technology (a former Laboratory division)
CVAA	cold vapor atomic absorption
CWDR	chemical waste disposal request
D&D	decontamination and decommissioning
DAF	dilution attenuation factor
DGPS	differential global positioning system
DER	duplicate error ratio
DL	detection limit

DOE	Department of Energy (U.S.)
dpm	disintegrations per minute
DRO	diesel range organics
DU	depleted uranium
EDL	estimated detection limit
Eh	oxidation/reduction potential
EM	electromagnetic
EP	Environmental Programs (Directorate)]
EPA	Environmental Protection Agency (U.S.)
EPC	exposure point concentration
EQL	estimated quantitation limits
ER	Environmental Restoration
ER ID	Environmental Remediation and Surveillance Program identification number
ESL	ecological screening level
eV	electron-volt
FD	field duplicate
FV	fallout value
GC	gas chromatography
GCMS	GC/mass spectrometry
GFAA	graphite furnace atomic absorption
gpm	gallons per minute
GPR	ground-penetrating radar
GPS	global-positioning system
GRO	gasoline range organics
HE	high explosive
HI	hazard index
HIR	historical investigation report
HPLC	high-performance liquid chromatography
HQ	hazard quotient
HR	home range
HRL	Health Research Laboratory
HSA	hollow-stem auger
HSWA	Hazardous and Solid Waste Amendments
HWFP	hazardous waste facility permit

ICB	initial calibration blank
ICPMS	inductively coupled plasma mass spectroscopy
ICPES	inductively coupled plasma emission spectroscopy
ICS	interference check sample
ICV	initial calibration verification
ID	identification
I.D.	Inside diameter
IDL	instrument detection limit
IDW	Investigation-derived waste
IS	internal standard
K_d	soil-water partition coefficient
K_{oc}	organic-carbon partition coefficient
K_{ow}	octanol-water partition coefficient
LAL	lower acceptance limit
LAMC	Los Alamos Medical Center
LANL	Los Alamos National Laboratory
LASL	Los Alamos Scientific Laboratory
LCS	laboratory control sample
LLW	low-level waste
LOAEL	lowest observed adverse effect level
LS Division	Life Science Division
MASW	multi-channel analysis of surface waves
MCAL	Mobile Chemistry Analytical Laboratory
MCL	maximum contaminant level
MDC	minimum detectable concentration
MDL	method detection limit
MS	matrix spike
MSW	municipal solid waste
NMED	New Mexico Environment Department
NMEID	New Mexico Environmental Improvement Division (now NMED)
NMHWA	New Mexico Hazardous Waste Act
NMSA	New Mexico Statues Annotated
NOAEL	no-observed-adverse-effect level
NOD	notice of disapproval

NPDES	National Pollutant Discharge Elimination System
NRX	Navy experiment (reactor parts)
PAH	polycyclic aromatic hydrocarbon
PAUF	population area use factor
PCB	polychlorinated biphenyl
PID	photoionization detector
PPE	personal protective equipment
ppmv	part(s) per million by volume
PRG	preliminary remediation goal
QA/QC	quality assurance/quality control
QP	quality procedure
RAGS	Risk Assessment Guidance (EPA Superfund)
RAIS	Risk Assessment Information System
RCRA	Resource Conservation and Recovery Act
RCT	radiological control technician
RDA	recommended daily allowance
RESRAD	Residual Radioactivity computer code
RfD	reference dose
RFI	Resource Conservation and Recovery Act Facility Investigation
RL	reporting limit
RPD	relative percent difference
RRF	relative response factor
SAL	screening action level
SCDM	Superfund Chemical Data Matrix
SCL	sample collection log
SF	slope factor
SMO	sample management office
SOP	standard operating procedure
SOW	statement of work
SSL	soil screening level
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TA	technical area
TAL	target analyte list

TCLP	toxicity characteristic leaching procedure
T&E	threatened and endangered
TEF	toxic equivalency factor
TNT	trinitrotoluene
TPH	total petroleum hydrocarbons
TPU	total propagated uncertainty
TRV	toxicity reference value
TSD	treatment, storage, and disposal (facility)
UAL	upper acceptance level
UCL	upper confidence limit
ULR	unassigned land release
USGS	United States Geological Survey
UST	underground storage tanks
VCA	voluntary corrective action
VCP	vitrified-clay pipe
VOC	volatile organic compound
WCSF	waste characterization strategy form
WPF	waste profile form
WQCC	Water Quality Control Commission

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

Field Methods

B-1.0 INTRODUCTION

This appendix summarizes field methods used during the 2008 and 2009 investigation of Upper Los Alamos Canyon Aggregate Area at the Los Alamos National Laboratory (LANL or Laboratory). Table B-1.0-1 provides a general summary of methods used, and the following sections provide more detailed description of the field methods. All activities were conducted in accordance with the applicable Environmental Programs (EP) Directorate standard operating procedures (SOPs) and quality procedures (QPs), which are listed in Table B-1.0-2 and are available at http://www.lanl.gov/environment/all/qa.shtml.

B-2.0 EXPLORATORY DRILLING CHARACTERIZATION

No exploratory drilling characterization was conducted. All drilling was conducted for the purpose of collecting investigation samples.

B-3.0 FIELD-SCREENING METHODS

This section summarizes the field-screening methods used during the investigation activities. Field screening for volatile organic compounds (VOCs) and radioactivity was performed on each sample. The field-screening results are presented in Table 4.5-1 of the investigation report.

B-3.1 Field Screening for VOCs

Field screening for VOCs was conducted for all samples, except as noted in section B-9.0. Screening was conducted using a MiniRAE 2000 photoionization detector (PID) equipped with an 11.7 electron-volt (eV) lamp. Screening was performed in accordance with SOP-06.33, Headspace Vapor Screening with a Photoionization Detector. Screening was performed on each sample collected and screening measurements were recorded on the field sample collection log (SCL)/chain-of-custody (COC) forms. The SCL/COCs are provided in Appendix E, Analytical Suites and Results and Analytical Reports. The screening results are presented in Table 4.5-1 of the investigation report.

B-3.2 Field Screening for Radioactivity

During sampling of soil, fill, tuff, or sediment, each sample was screened for radioactivity immediately at collection, targeting alpha and beta/gamma emitters. Screening was conducted by a LANL radiation control technician (RCT) using an Eberline E-600 radiation meter with an SHP-380AB alpha and beta/gamma scintillation detector. The Eberline E 600 with attachment SHP-380AB consists of a dual phosphor plate covered by two mylar windows housed in a light-excluding metal body. The phosphor plate is a plastic scintillator for the detection of beta and gamma emissions and is thinly coated with zinc sulfide for the detection of alpha emissions. The operational range varies from trace emissions to 1 million disintegrations per minute (dpm). The screening results are presented in Table 4.5-1 of the investigation report.

B-4.0 FIELD-INSTRUMENT CALIBRATION

All instruments were calibrated before use. Calibration of the MiniRAE 2000 PID was conducted at least daily by the site crew. Calibration of the Eberline E-600 was conducted by the RCT. All calibrations were performed according to the manufacturer's specifications and requirements.

B-4.1 MiniRAE 2000 Instrument Calibration

The MiniRAE 2000 PID was calibrated both to ambient air and a standard reference gas (100 ppm isobutylene). The ambient-air calibration determined the zero point of the instrument sensor calibration curve in ambient air. Calibration with the standard reference gas determined a second point of the sensor calibration curve. Each calibration was within 3% of 100 ppm isobutylene, qualifying the instrument for use.

The following calibration information was recorded daily on operational calibration logs:

- instrument identification (ID) number
- final span settings
- date and time
- concentration and type of calibration gas used (isobutylene at 100 ppm)
- name of the personnel performing the calibration

All daily calibration procedures for the MiniRAE 2000 PID met the manufacturer's specifications for standard reference gas calibration and the requirements of SOP-5006, Control of Measuring and Test Equipment.

B-4.2 Eberline E-600 Instrument Calibration

The Eberline E-600 was calibrated daily by the RCT before local background levels for radioactivity were measured. The instrument was calibrated using plutonium-239 and chloride-36 sources for alpha and beta emissions, respectively. The following five checks were performed as part of the calibration procedures:

- calibration date
- physical damage
- battery
- response to a source of radioactivity
- background

All calibrations performed for the Eberline E-600 met the manufacturer's specifications, the requirements of SOP-5006, and the applicable radiation detection instrument manual.

B-5.0 SURFACE AND SUBSURFACE SAMPLING

This section summarizes the methods used for collecting surface and subsurface samples, including soil, fill, tuff, and sediment samples, according to the investigation work plan (LANL 2006, 091916), its revisions (LANL 2006, 094200), and the New Mexico Environment Department's (NMED's) approval with modifications (NMED 2006, 095460).

B-5.1 Surface Sampling Methods

Surface samples were collected within former Technical Area 01 (TA-01), TA-03, former TA-32, TA-41, TA-43, and TA-61 using either hand-auger or spade and scoop methods. Surface samples were collected in accordance with SOP-06.10, R3, Hand Auger and Thin-Wall Tube Sampler or SOP-06.09, Spade and

Scoop Method for Collection of Soil Samples. A hand auger or spade and scoop was used to collect material in approximately 6-in. increments. A stainless-steel scoop and bowl were used to homogenize the samples that were transferred to sterile sample collection jars or bags. Samples were preserved using coolers to maintain the required temperature and by using chemical preservatives such as nitric acid, as required by EP-ERSS-SOP-5056, Sample Containers and Preservation.

Samples were appropriately labeled, sealed with custody seals, and documented before transporting to the Sample Management Office (SMO). Samples were managed according to EP-ERSS-SOP-5057, Handling, Packaging, and Transporting Field Samples, and EP-ERSS-SOP-5058 Sample Control and Field Documentation.

Sample collection tools were decontaminated (see section B-5.7) immediately before collection of each sample in accordance with SOP-5061, Field Decontamination of Drilling and Sampling Equipment.

B-5.2 Borehole Logging

Continuous boring logs were completed for boreholes drilled with a hollow-stem auger (HSA) drill rig. During drilling, all boreholes were continuously cored and logged in 2.5-ft intervals in accordance with SOP-12.01, Field Logging, Handling, and Documentation of Borehole Materials. Information recorded in field boring logs included footage and percent recovery, lithology and depths of lithologic contacts, depth of samples collected, core descriptions, and other relevant observations. The boring logs are presented in Appendix C.

B-5.3 Subsurface Tuff Sampling Methods

Subsurface samples were collected using a hand auger in accordance with SOP-06.10, or using a HSA drill rig in accordance with SOP-06.26, Core Barrel Sampling for Subsurface Earth Materials. Borehole samples were collected in a stainless-steel split-spoon core-barrel sampler that retrieved core in 2.5-ft intervals. The samples collected, listed by borehole and depth, are listed in Table 1.3-3 of this investigation report.

Core retrieved from the subsurface was field screened for VOCs and radioactivity, and was visually inspected and logged. Following inspection, the 2.5-ft core section to be sampled was removed from the core barrel and placed in a stainless-steel bowl and homogenized. The material was crushed, if necessary, with a decontaminated rock hammer and stainless-steel spoon to allow core material to fit into sample containers.

Samples for VOC analysis were collected immediately to minimize loss of subsurface VOCs during the sample-collection process. After collection of the VOC samples, a stainless-steel scoop and bowl were used to homogenize the samples for the remaining analytical suites, which were then transferred to sterile sample collection jars or bags for transport to the SMO. The tools used to collect samples were decontaminated (see section B-5.7) immediately before each sample was collected in accordance with SOP-5061.

B-5.4 Quality Control Samples

Quality control (QC) samples were collected in accordance with SOP-5059, Field Quality Control Samples. QC samples included field duplicates, field rinsate blanks, and field trip blanks. Field duplicate samples were collected from the same material as a regular investigation sample and submitted for the same analyses. Field duplicate samples were collected at a frequency of at least 1 duplicate sample for every 10 samples.

Field rinsate blanks were collected to evaluate field decontamination procedures. Rinsate blanks were collected by rinsing sampling equipment (i.e., auger buckets, sampling bowls and spoons) after it was decontaminated with deionized water. The rinsate water was collected in a sample container and submitted to the SMO. Field rinsate blank samples were analyzed for inorganic chemicals (TAL metals, perchlorate, and cyanide [total]) and were collected from sampling equipment at a frequency of at least 1 rinsate sample for every 10 solid samples.

Field trip blanks also were collected at a frequency of 1 per 10 samples when samples were collected for VOC analysis. Trip blanks consisted of containers of certified clean sand opened and kept with the other sample containers during the sampling process.

B-5.5 Sample Documentation and Handling

Field personnel completed an SCL/COC form for each sample. Sample containers were sealed with signed custody seals and placed in coolers at approximately 4°C. Samples were handled in accordance with SOP-5057, and with SOP-5056, Sample Containers and Preservation. Samples were transported to the SMO for processing and shipment to offsite contract analytical laboratories. The SMO personnel reviewed and approved the SCL/COC forms and accepted custody of the samples.

B-5.6 Borehole Abandonment

All boreholes were abandoned in accordance with SOP-5034, Monitor Well and RFI Borehole Abandonment, by filling the boreholes with a bentonite/concrete mixture. A tremie pipe was used to fill the boreholes upward from the bottom of the boreholes to the surface. All cuttings were managed as investigation-derived waste (IDW) as described in Appendix H. Shallow borings in this investigation were abandoned by placing bentonite chips in the borehole up to 2–3 ft from the ground surface. The chips were hydrated and clean soil was placed on top. Pavement was patched as necessary depending on existing site conditions.

B-5.7 Decontamination of Sampling Equipment

The split-spoon core barrels and all other sampling equipment that made (or could have made) contact with sample material were decontaminated after each core was retrieved and logged. Decontamination included wiping the equipment with Fantastik and paper towels. Decontamination of the drilling equipment was conducted before mobilization of the drill rig to another borehole to avoid cross-contamination between samples and borehole locations. Residual material adhering to equipment was removed using dry decontamination methods such as the use of wire brushes and scrapers. Decontamination activities were performed in accordance with SOP-5061, and field rinsate blank samples were collected in accordance with SOP-5059.

B-6.0 GEODETIC SURVEYING

Geodetic surveys of all sample locations were performed by a certified surveyor using a Trimble RTK 5700 differential global positioning system (DGPS) referenced from published and monumented external Laboratory survey control points in the vicinity. All sample locations were surveyed in accordance with SOP-5028, Coordinating and Evaluating Geodetic Surveys. Horizontal accuracy of the monumented control points is within 0.1 ft. The DGPS instrument referenced from Laboratory control points is accurate within 0.2 ft. The surveyed coordinates are presented in Table 4.1-1 of the investigation report.

B-7.0 INVESTIGATION-DERIVED WASTE STORAGE AND DISPOSAL

All IDW generated during the field investigation was managed in accordance with EP-ERSS-SOP-5022, Characterization and Management of Environmental Restoration (ER) Project Waste. This procedure incorporates the requirements of all applicable U.S. Environmental Protection Agency (EPA) and NMED regulations, U.S. Department of Energy (DOE) orders, and Laboratory implementation requirements. Details of IDW management for the Upper Los Alamos Canyon Aggregate Area investigation are presented in Appendix H.

B-8.0 DEVIATIONS FROM WORK PLAN

The following additions to or deviations from the approved work plan were made as a result of site conditions encountered during sampling activities, field observations, or property-owner requests.

- At SWMU 01-002, two additional locations were sampled at the request of the property owner. These locations (00-604530 and 00-604531) were each sampled at two depths and analyzed for the same suite as the other SWMU 01-002 samples.
- At SWMU 01-001(b) and C-43-001, additional samples were collected downslope of the locations proposed in the work plan to ensure definition of lateral extent. Per the response to the notice of disapproval for the work plan (LANL 2006, 094200), these samples were part of a phased approach at sites where the drainage was not well defined and where sampling at locations all the way to the toe of the slope was not practical because the path of the effluent was unknown. Based on the data from the original samples and geomorphic evaluation, additional samples were collected downslope at both of these sites. The lateral extent of contamination was defined at SWMU 01-001(b). The lateral extent was not defined at AOC C-43-001: concentrations of lead increased significantly in the downslope samples. Phase II sampling is proposed for this site.
- At some canyon-slope sites, debris consisting of reinforced concrete slabs prevented sample collection from a second depth at some locations. These locations were not accessible by a drill rig, and hand-auger methods were required. In these cases, a single sample depth was collected, and additional sampling locations were selected downslope of the debris field in an attempt to define the extent of contamination. Samples were collected from two depths at each of these new locations. Auger refusal occurred when concrete debris was encountered at the following sites:
    - SWMU 01-001(c), one location that was not drill-rig or backhoe accessible, and no unobstructed alternate location was available;
    - SWMU 01-001(o), locations 00-603858 and 00-603851;
    - SWMU 01-003(a), location 00-603918;
    - SWMU 01-003(e), locations 00-604033, 00-604034, 00-604035, 00-604036, 00-604037, and 00-604038; and
    - SWMU 01-006(o), locations 00-604052, 00-604053, 00-604054, and 00-604055.
- At SWMU 03-055(c), the sampling approach was revised from the approach in the approved work plan (i.e., one location downstream of the outfall and three locations fanned out less than 10 ft downstream from that). Because of the nature of the drainage channel (approximately 2 ft wide and very well defined), it was proposed to eliminate the fanned out locations and instead conduct sediment sampling based on a geomorphic approach. This approach was discussed with, and approved by, NMED (Dhawan 2007, 105594) before sampling began. The sampling approach as

implemented included 10 sampling locations with between one and five sampling depths at each location, along the length of the channel to the canyon edge (approximately 250 ft), for a total of 20 samples.

- The approval of the modification to the sampling approach at SWMU 03-055(c) stipulated that multiple depths be sampled at each location. However, the sampling team did not collect multiple depths at some locations because the sediment accumulations were not deep enough to allow multiple depths. Ten locations were sampled with five of those locations being sampled at a single depth. Five locations were sampled at multiple depths as planned. A total of 20 samples were collected.
- No field screening was conducted during sampling at SWMU 03-055(c). Based on site history, it was not expected that significant levels of radionuclides would be present in sediments from the site. Based on the deposition process, field-measurable concentrations of VOCs would likewise not be expected in the sediment. Data from the site appear typical of runoff from parking lots and indicate the presence of low concentrations of contaminants associated with asphalt and fuel.
- At SWMU 61-007, the presence of numerous overhead and underground utilities resulted in the need to adjust sampling locations and depths. Twenty-two samples were collected from six locations rather than 27 samples from five locations as specified in the work plan. Aroclor-1260 decreases significantly with depth and the highest concentrations encountered are in the shallowest sample from the center of the site. Locations on the north and south side of the site remain elevated, however, and soil removal is being proposed for the site.

B-9.0 REFERENCES

The following list includes all documents cited in this appendix. 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.

Dhawan, N., December 6, 2007. RE: 03-055(c) sediment sampling. E-mail message to B. Coel-Roback (LANL) from N. Dhawan (NMED), Santa Fe, New Mexico. (Dhawan 2007, 105594)

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

LANL (Los Alamos National Laboratory), August 22, 2006. "Response to the Notice of Disapproval for Investigation Work Plan for the Upper Los Alamos Canyon Aggregate Area," Los Alamos National Laboratory document LA-UR-06-6753, Los Alamos, New Mexico. (LANL 2006, 094200)

NMED (New Mexico Environment Department), November 6, 2006. "Approval of the Investigation Work Plan, Upper Los Alamos Canyon Aggregate Area," New Mexico Environment Department letter to D. Gregory (DOE-LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2006, 095460)

Table B-1.0-1
Summary of Field Investigation Methods

Method	Summary
Spade and Scoop Collection of Soil Samples	This method is typically used for collection of shallow (i.e., approximately 0-12 in.) soil or sediment samples. The spade-and-scoop method involves digging a hole to the desired depth, as prescribed in the work 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 [I.D.]), creating a vertical hole that can be advanced to the desired sampling depth. When the desired depth was reached, the auger was decontaminated before the hole was advanced through the sample depth. The sample material was transferred from the auger bucket to a stainless-steel sampling bowl before the various required sample containers were filled.
Split-Spoon Core-Barrel Sampling	In this method, a stainless-steel core barrel (typically 4-in. I.D., 2.5 ft long) is advanced using a powered drilling rig. The core barrel extracts a continuous length of soil and/or rock that can be examined as a unit. The split-spoon core barrel is a cylindrical barrel split lengthwise so that the two halves can be separated to expose the core sample. Once extracted, the section of core was screened for radioactivity and organic vapors, and described in a geologic log. A portion of the core was then collected as a discrete sample from the desired depth.
Handling, Packaging, and Shipping of Samples	Field team members sealed and labeled samples before packing to ensure the sample containers and the containers used for transport were free of external contamination. Field team members packaged all samples to minimize the possibility of breakage during transportation. After all environmental samples were collected, packaged, and preserved, a field team member transported them to the SMO. The SMO arranged for shipping the samples to analytical laboratories.
Sample Control and Field Documentation	The collection, screening, and transport of samples were documented on standard forms generated by the SMO. These included SCLs, COC forms, and sample container labels. SCLs were completed at the time of sample collection and the logs were signed by the sampler and a reviewer who verified the logs for completeness and accuracy. Corresponding labels were initialed and applied to each sample container, and custody seals were placed around each sample container. COC forms were completed and signed to verify the samples had not been left unattended.
Field Quality Control Samples	Field quality control samples were collected as follows. *Field duplicates*: at a frequency 10%; collected at the same time as a regular sample and submitted for the same analyses *Equipment rinsate blank*: at a frequency of 10%; collected by rinsing sampling equipment with deionized water, which was collected in a sample container and submitted for laboratory analysis *Trip blanks*: required for all field events, including collecting samples for VOC analysis. Trip blanks containers of certified clean sand were opened and kept with the other sample containers during the sampling process
Field Decontamination of Drilling and Sampling Equipment	Dry decontamination was used to minimize the generation of liquid waste. Dry decontamination included the use of a wire brush or other tool to remove soil or other material adhering to the sampling equipment, followed by use of a commercial cleaning agent (nonacid, waxless cleaners) and paper wipes.

Table B-1.0-1 (continued)

Method	Summary
Containers and Preservation of Samples	Specific requirements/processes for sample containers, preservation techniques, and holding times are based on EPA guidance for environmental sampling, preservation, and quality assurance. Specific requirements for each sample were printed in the SCLs provided by the SMO (size and type of container [e.g., glass, amber glass, and polyethylene]). All samples were preserved by being placed in insulated containers with ice to maintain a temperature of 4˚C.
Coordinating and Evaluating Geodetic Surveys	Geodetic surveys focused on obtaining survey data of acceptable quality for use during project investigations. Geodetic surveys were conducted with a Trimble 5700 DGPS. The survey data conformed to Laboratory Information Architecture project standards IA-CB02, GIS Horizontal Spatial Reference System, and IA-D802, Geospatial Positioning Accuracy Standard for A/E/C/ and Facility Management. All coordinates were expressed as State Plain Coordinate System 83, NM Central, U.S. feet coordinates. All elevation data were reported relative to the National Geodetic Vertical Datum of 1983.
Management of Environmental Restoration Project Waste, Waste Characterization	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 complied with on-site or off-site waste acceptance criteria. All stored IDW was marked with appropriate signage and labels. Drummed IDW was stored on pallets to prevent deterioration of containers. A waste storage area was established before waste was generated. Waste storage areas located in controlled areas of the laboratory to prevent unauthorized personnel from inadvertently adding or managing wastes. Each container of waste generated was individually labeled with the waste classification and item identification number and as radioactive (if applicable), immediately following containerization. All waste was segregated by classification and compatibility to prevent cross-contamination. Management of IDW is discussed in Appendix H.

Table B-1.0-2
Quality Procedures and Standard Operating Procedures
Used for the Investigation Activities at Upper Los Alamos Canyon Aggregate Area

SOP-2011, Personnel Training and Qualification
SOP-4001, Document Control
SOP-4003, Records Management
SOP-4004, Records Transmittal and Retrieval Processes
SOP-5006, Control of Measuring and Test Equipment
EP-ERSS-SOP-5018, Integrated Fieldwork Planning and Authorization
EP-ERSS-SOP-5022, Characterization and Management of Environmental Restoration (ER) Project Waste
EP-ERSS-SOP-5028, Coordinating and Evaluating Geodetic Surveys
SOP-5034, Monitor Well and RFI Borehole Abandonment
EP-ERSS-SOP-5055, General Instructions for Field Investigations
EP-ERSS-SOP-5056, Sample Containers and Preservation
EP-ERSS-SOP-5057, Handling, Packaging, and Transporting Field Samples
EP-ERSS-SOP-5058 Sample Control and Field Documentation
EP-ERSS-SOP-5059 Field Quality Control Samples
SOP-5061, Field Decontamination of Equipment
SOP-01.12 Field Site Closeout Checklist
SOP-01.13, Initiating and Managing Data Set Requests
SOP-06.09, Spade and Scoop Method for Collection of Soil Samples
SOP-06.10, Hand Auger and Thin-Wall Tube Sampler
SOP-06.26, Core Barrel Sampling for Subsurface Earth Materials
SOP-06.33, Headspace Vapor Screening with a Photoionization Detector
SOP-5181, Notebook Documentation for Environmental Restoration Technical Activities
EP-DIR-QAP-0001, Quality Assurance Plan for the Environmental Programs

Note: These procedures are available at http://www.lanl.gov/environment/all/qa.shtml.

Appendix C

Borehole Logs
(on DVD included with this document)

Appendix D

Analytical Program

D-1.0 INTRODUCTION

This appendix presents the analytical methods used and the data quality review of the sample results from the Upper Los Alamos Canyon Aggregate Area investigation at Los Alamos National Laboratory (the Laboratory).

The analytical program for this investigation includes submission of samples to approved contract laboratories, with specific requirements for analytical methods, data quality, and reporting. Quality assurance (QA), quality control (QC), and data validation procedures were implemented in accordance with the requirements of the Quality Assurance Project Plan Requirements for Sampling and Analysis (LANL 1996, 054609), and the analytical services statement of work (SOW) for contract laboratories (LANL 2000, 071233). The results of the QA/QC activities were used to estimate accuracy, bias, and precision of the analytical measurements. QC samples included preparation blanks, blank spikes, matrix spikes, and laboratory control samples (LCSs) to assess accuracy and bias. Internal standards, external standards, surrogates, and tracers were also used to assess accuracy.

The type and frequency of QC analyses are described in the analytical service SOW (LANL 2000, 071233), along with the applicable analytical methods. Other QC factors such as sample preservation and holding times were also assessed in accordance with the requirements outlined in standard operating procedure (SOP)-5056, Sample Containers and Preservation. Evaluating these QC indicators allows estimates to be made of the accuracy, bias, and precision of the analytical suites. A focused data validation was also performed for all the data packages (also referred to as request numbers).

The following SOPs were used for data validation:

- SOP-5161, Routine Validation of Volatile Organic Compound (VOC) Data;
- SOP-5162, Routine Validation of Semivolatile Organic Compound (SVOC) Data;
- SOP-5163, Routine Validation of Organochlorine Pesticides (PEST) and Polychlorinated Biphenyls (PCB) Data
- SOP-5164, Routine Validation of High Explosives (HE) Data;
- SOP-5165, Routine Validation of Metals Analytical Data;
- SOP-5166, Routine Validation of Gamma Spectroscopy, Chemical Separation Alpha Spectrometry, Gas Proportional Counting, and Liquid Scintillation Analytical Data; and
- SOP-5169, Routine Validation of Dioxin Furan Data
- SOP-5171, Routine Validation of Total Petroleum Hydrocarbons Gasoline Range Organics/Diesel Range Organics Analytical Data
- SOP-5191, Routine Validation of LC/MS/MS Perchlorate Analytical Data (SW-846 EPA Method 6850)

The focused validation included a more detailed review of the data generated by the analytical laboratory. The analytical data and instrument printouts used during focused validation and the validation reports are provided in Appendix E.

Analytical data were reviewed and evaluated based on U.S. Environmental Protection Agency (EPA) National Functional Guidelines for inorganic and organic chemical data review where applicable (EPA 1994, 048639; EPA 1999, 066649). As a result of the data validation and assessment efforts, qualifiers

may be assigned to the analytical records as appropriate. The data qualifiers used in the data validation procedures are defined in Appendix A.

Summaries of the analytical methods for inorganic chemicals, radionuclides, and organic chemicals are provided in Tables D-2.0-1, D-3.0-1, and D-4.0-1.

D-2.0 INORGANIC CHEMICAL ANALYSIS SUMMARY

A total of 761 samples (plus 83 field duplicates) collected within the Upper Los Alamos Canyon Aggregate Area were analyzed for inorganic chemicals. All 761 samples (plus 83 field duplicates) were analyzed for target analyte list (TAL) metals; 637 samples (plus 73 field duplicates) were also analyzed for perchlorate; 664 samples (plus 82 field duplicates) were also analyzed for total cyanide; 639 (plus 73 field duplicates) were also analyzed for nitrate. The analytical methods used for inorganic chemicals are listed in Table D-2.0-1.

D-2.1 Inorganic Chemical QA/QC Summary

The use of QA/QC samples is designed to produce quantitative measures of the reliability of specific parts of an analytical procedure. The results of the QA/QC analyses performed on a sample provide confidence about whether the analyte is present and whether the concentration reported is accurate. The validation of inorganic chemical data can result in the rejection of the data or the assignment of various qualifiers to individual sample results (see Appendix A for data qualifier definitions).

The LCSs, preparation blanks, matrix spike (MS) samples, field duplicate samples, interference check samples, and serial dilution samples were analyzed to assess accuracy and precision of inorganic chemical analyses. Each of these QA/QC sample types is defined in the analytical services SOW (LANL 2000, 071233) and described briefly below.

The LCS serves as a monitor of the overall performance of each step during the analysis, including sample digestion. The analytical results for the samples were qualified according to National Functional Guidelines (EPA 1994, 048639) if the individual LCS recovery indicated a bias in the measurement of individual analytes. LCS control limits of less than 30% and greater than 150% are prohibited (LANL 2000, 071233).

Preparation blanks are used as a measurement of bias and potential cross-contamination. Results of inorganic chemical analyses for preparation blanks were all within acceptable limits. All target analytes should be below the contract-required detection limit (CRDL) in the preparation blank.

The accuracy of inorganic chemical analyses is also assessed using MS samples. An MS sample is designed to provide information about the effect of each sample matrix on the sample preparation procedures and analytical technique. The spike sample recoveries should be within the acceptance range of 75%–125% (LANL 2000, 071233).

Analyzing duplicate samples assesses the precision of inorganic chemical analyses. The relative percent differences (RPDs) between the sample and the duplicate should be ±35% for samples with concentrations greater than or equal to 5 times the reporting limit; for samples with concentrations less than 5 times the reporting limit, the relative percent difference (RPD) is the reporting limit (LANL 2000, 071233).

Calibration verification is the establishment of a quantitative relationship between the response of the analytical procedure and the concentration of the target analyte. There are two aspects of calibration

verification: initial and continuing. The initial calibration verifies the accuracy of the calibration curve as well as the individual calibration standards used to perform the calibration. The continuing calibration ensures that the initial calibration is still holding and correct as the instrument is used to process samples. The continuing calibration also serves to determine that analyte identification criteria such as retention times and spectral matching are being met.

All procedures were followed as required by the analytical service SOW (LANL 2000, 071233) and applicable corresponding EPA SW-846 methodologies.

One nitrate result and 29 TAL metal result were qualified as estimated (J) because the sample results was reported as detected between the instrument detection limit (IDL) and the estimated detection limit (EDL).

D-2.1.1 Maintenance of Chain of Custody

Chain-of-custody (COC) forms were maintained properly for all samples (Appendix E).

D-2.1.2 Sample Documentation

Samples were properly documented on sample collection log (SCL)/COC forms in the field (Appendix E).

D-2.1.3 Sample Dilutions

Ninety-one TAL metal results were qualified as estimated (J) because the serial dilution sample RPD was greater than 10% and the sample result was greater than 50 times the method detection limit (MDL).

D-2.1.4 Sample Preservation

Preservation criteria were met for all samples analyzed for inorganic chemicals.

D-2.1.5 Holding Times

One nitrate result, 1 perchlorate result, and 19 cyanide (total) results were qualified as estimated and biased low (J-) because the extraction/analytical holding time were exceeded by less than twice the published method for holding times.

Eighty-five cyanide (total) results and one perchlorate result were qualified as estimated not detected (UJ) because the extraction/analytical holding time were exceeded by less than twice the published method for holding times.

D-2.1.6 Initial and Continuing Calibration Verifications

Fifty-five TAL metal results were qualified as estimated (J) because the initial calibration verification (ICV) and/or continuing calibration verification (CCV) were recovered outside the method-specific limits.

Four TAL metal results and eight perchlorate results were qualified as estimated not detected (UJ) because the ICV and/or CCV were recovered outside the method-specific limits.

A total of 112 TAL metal results and 3 perchlorate results were qualified as estimated (J) because the ICV and/or CCV were not analyzed at the appropriate method frequency.

Two TAL metal results and five perchlorate results were qualified as estimated not detected (UJ) because the ICV and/or CCV were not analyzed at the appropriate method frequency.

Six nitrate results were qualified as estimated not detected (UJ) because the affected analytes were analyzed with an initial calibration curve that exceed the percent relative standard deviation (%RSD) criteria and/or the associated multipoint calibration correlation coefficient was less than 0.995.

D-2.1.7 Internal Standards

Fourteen perchlorate results were qualified as estimated (J) because the internal standard (IS) area was less than 70% but greater than 25% of the average of that obtained from the calibration standards.

Seventy-four perchlorate results were qualified as estimated not detected (UJ) because the IS area was less than 70% but greater than 25% of the average of that obtained from the calibration standards.

Two perchlorate results were qualified as estimated not detected (UJ) because the IS was greater than 130% of the average of that obtained from the calibration standards.

D-2.1.8 Interference Check Sample and/or Serial Dilutions

No qualifiers were assigned to inorganic chemical analysis results because of interference check sample (ICS) or serial dilution problems.

D-2.1.9 Laboratory Duplicates

A total of 368 TAL metal results were qualified as estimated (J) because the sample and the duplicate sample results were greater than or equal to 5 times the reporting limit (RL), and the duplicate RPD was greater than 35%.

A total of 122 TAL metal results were qualified as estimated (J) because the duplicate results exceeded the RPD requirements.

Two TAL metal results were qualified as estimated (J) because the duplicate sample was not prepared and/or analyzed with the samples for unspecified reasons.

D-2.1.10 Method and Preparation Blanks

Nine nitrate results, 654 TAL metal results, and 215 cyanide (total) results were qualified as not detected (U) because the sample result was less than or equal to five times the concentration of the related analyte in the preparation blank.

One nitrate result , 1263 TAL metal results, and three cyanide (total) results were qualified as estimated (J) because the results were less than five times the amount in the preparation blank.

Fifteen TAL metal results and 13 cyanide (total) results were qualified as not detected (U) because the results were less than five times the amount in the preparation blank.

Eight nitrate results, 1065 TAL metal results, and 121 cyanide (total) results were qualified as not detected (U) because the sample result was less than or equal to 5 times the concentration of the related analyte in the initial calibration blank (ICB)/continuous calibration blank (CCB).

One nitrate result and 14 TAL metal results were qualified as not detected (U) because the sample result was less than or equal to 5 times the concentration of the related analyte in the trip blank or equipment rinsate blank.

A total of 1068 TAL metal results were qualified as estimated (J) because the IS area count for the quantitating IS was greater than 125% in relation to the metals calibration blank.

Thirteen TAL metal results were qualified as estimated not detected (UJ) because the IS area count for the quantitating IS was greater than 125% in relation to the metals calibration blank.

D-2.1.11 Matrix Spikes

Six TAL metal results were qualified as estimated and biased high (J+) because the analyte was recovered above 150% in the associated spike sample.

Nine nitrate results and 473 TAL metal results were qualified as estimated and biased high (J+) because the associated matrix spike recovery was greater than the upper acceptance level (UAL).

Six nitrate results and 58 TAL metal results were qualified as estimated and biased high (J+) because the analyte was recovered above the UAL but less than 150% of the associated spike sample.

One nitrate result and 25 TAL metal results were qualified as estimated and biased low (J-) because the analyte was recovered below the lower acceptance level (LAL) but greater than 30% in the associated spike sample.

Four nitrate results and 96 TAL metal results were qualified as estimated not detected (UJ) because the analyte was recovered below the LAL but greater than 30% in the associated spike sample.

Ten of 724 cyanide (total) results and 1042 TAL metal results were qualified as estimated and biased low (J-) because the associated matrix spike recovery was less than the LAL but greater than 10%.

One nitrate results, 21 TAL metal results, and one cyanide (total) result were qualified as estimated not detected (UJ) because the associated matrix spike recovery was greater than the UAL.

Seventeen cyanide (total) results and 10 TAL metal results were qualified as estimated not detected (UJ) because the associated matrix spike recovery was less than the LAL but greater than 10%.

D-2.1.12 Laboratory Control Sample Recoveries

Seventy-two TAL metal results were qualified as estimated and biased high (J+) because the LCS percent recovery was above the UAL.

D-2.1.13 Rejected Results

Three TAL metal results were rejected because the associated spike sample recovery was less than 10%.

Twenty-four cyanide (total) results and 126 TAL metal results were rejected because the associated matrix spike recovery was less than 10%.

Two perchlorate results were rejected because ion abundance ratios did not meet specifications.

D-3.0 ORGANIC CHEMICAL ANALYSIS SUMMARY

A total of 750 samples (plus 82 field duplicates) collected within the Upper Los Alamos Canyon Aggregate Area were analyzed for organic chemicals. A total of 734 samples (plus 81 field duplicates) were analyzed for volatile organic chemicals (VOCs); 750 samples (plus 82 field duplicates) were analyzed for semivolatile organic chemicals (SVOCs); 697 samples (plus 77 field duplicates) were analyzed for polychlorinated biphenyls (PCBs); 88 samples (plus 6 field duplicates) were analyzed for dioxins and furans; 37 samples (plus 2 field duplicates) were analyzed for pesticides; and 20 samples (plus 2 field duplicates) were analyzed for explosive compounds. The analytical methods used for organic chemicals are listed in Table D-3.0-1.

D-3.1 Organic Chemical QA/QC Summary

The use of QA/QC samples is designed to produce quantitative measures of the reliability of specific parts of an analytical procedure. The results of the QA/QC analyses performed on a sample provide confidence about whether the analyte is present and whether the concentration reported is accurate. The validation of organic chemical data can result in the rejection of the data or the assignment of various qualifiers to individual sample results (see Appendix A for data qualifier definitions).

Calibration verifications, instrument-performance checks, LCSs, method blanks, MS samples, surrogates, and IS were analyzed to assess the accuracy and precision of organic chemical analyses. Each of these QA/QC sample types is defined in the analytical services SOW (LANL 2000, 071233) and described briefly in the paragraphs below.

Calibration verification is the establishment of a quantitative relationship between the response of the analytical procedure and the concentration of the target analyte. There are two aspects of calibration verification: initial and continuing. The initial calibration verifies the accuracy of the calibration curve as well as the individual calibration standards used to perform the calibration. The continuing calibration ensures that the initial calibration is still holding and correct as the instrument is used to process samples. The continuing calibration also serves to determine that analyte identification criteria such as retention times and spectral matching are being met.

Instrument performance check is the analysis of a chemical of known relative mass abundance that indicates how well a mass spectrometer is calibrated

The LCS is a sample of a known matrix spiked with compounds that are representative of the target analytes, and serves as a monitor of overall performance on a controlled sample. The LCS is the primary demonstration, on a daily basis, of the ability to analyze samples with good qualitative and quantitative accuracy. The analytical results for the samples were qualified according to National Functional Guidelines (EPA 1999, 066649) if the individual LCS recoveries were not within method-specific acceptance criteria. The LCS recoveries should fall within the control limits of 75%–125% (LANL 2000, 071233).

A method blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as those used in the environmental sample processing and which is extracted and analyzed in the same manner as the corresponding environmental samples. Method blanks are used to assess the potential for sample contamination during extraction and analysis. All target analytes should be below the CRDL in the method blank (LANL 2000, 071233).

The accuracy of organic chemical analyses is also assessed using MS samples, which are aliquots of the submitted samples spiked with a known concentration of the target analyte(s). MS samples are used to

measure the ability to recover prescribed analytes from a native sample matrix. Spiking typically occurs before sample preparation and analysis. The spike sample recoveries should be within the acceptance range calculated by the laboratory using the procedure given in EPA SW-846 Method 8000B and the QC acceptance criteria found within the specific SW-846 method (LANL 2000, 071233).

A surrogate compound (surrogate) is an organic compound used in the analyses of target analytes that is similar in composition and behavior to the target analytes but is not normally found in environmental samples. Surrogates are added to every blank, sample, and spike to evaluate the efficiency with which analytes are recovered during extraction and analysis. The recovery percentage of the surrogates must be within specified ranges of the specific SW-846 method (LANL 2000, 071233).

The IS are chemical compounds added to every blank, sample, and standard extract at a known concentration. They are used to compensate for (1) analyte concentration changes that might occur during storage of the extract and (2) quantitation variations that can occur during analysis. They are used as the basis for quantitation of target analytes. The percent recovery for IS should be within the acceptance range calculated by the laboratory using the procedure given in SW-846 Method 8000B and the QC acceptance criteria found within the specific SW-846 method (LANL 2000, 071233).

All QC procedures were followed as required in the analytical service SOW (LANL 2000, 071233) and applicable corresponding EPA SW-846 methodologies.

Four VOC results were qualified as estimated (J) because the associated relative response factor (RRF) was less than 0.05.

D-3.1.1 Maintenance of Chain of Custody

COC forms were maintained properly for all samples analyzed for organic chemicals (Appendix E).

D-3.1.2 Sample Documentation

Samples were properly documented in SCL/COCs in the field (Appendix E).

D-3.1.3 Sample Dilutions

Some samples were diluted for organic chemical analyses. No qualifiers were applied to any organic chemical results because of dilutions.

D-3.1.4 Sample Preservation

Preservation criteria were met for all samples analyzed for organic chemicals.

D-3.1.5 Holding Times

Thirty-six SVOC results and one VOC result were qualified as estimated and biased low (J-) because the extraction holding time was exceeded by less than twice the published method for holding times.

A total of 168 SVOC results and 57 VOC results were qualified as estimated not detected (UJ) because the extraction holding time was exceeded by less than twice the published method for holding times.

D-3.1.6 Initial and Continuing Calibration Verifications

Eighteen dioxin/furan results, 11 PCB results, 3 SVOC results, and 11 VOC results were qualified as estimated (J) because the ICV and/or CCV were recovered outside the method-specific limits.

Forty-two dioxin/furan results were qualified as estimated (J) because the ICV and/or CCV were not analyzed at the appropriate method frequency.

A total of 116 dioxin/furan results were qualified as estimated not detected (UJ) because the ICV and/or CCV were not analyzed at the appropriate method frequency.

A total of 136 PCB results, 699 SVOC results, and 1707 VOC results were qualified as estimated not detected (UJ) because the ICV and/or CCV were recovered outside the method-specific limits.

Seven PCB results, 22 SVOC results, and 10 VOC results were qualified as estimated (J) because the associated %RSD or percent difference (%D) exceeded criteria in the initial or continuing calibration standards.

Thirty-five explosive compounds results, 942 SVOC results, and 395 VOC results were qualified as estimated not detected (UJ) because the associated %RSD or %D exceeded the criteria in the initial or continuing calibration standards.

Forty-two SVOC results were qualified as estimated (J) because the associated IS area counts were less than 50% but greater than 10 percent recovery (%R) when compared to the area counts in the applicable continuing calibration standard.

A total of 134 four SVOC results were qualified as estimated not detected (UJ) because the associated IS area counts were less than 50% but greater than 10% R when compared to the area counts in the applicable continuing calibration standard.

Forty-nine SVOC results and 4 VOC results were qualified as estimated (J) because the IS area count for the quantitating IS was less than 50% but greater than 10% in relation to the previous continuing calibration.

A total of 245 SVOC results and 1000 VOC results were qualified as estimated not detected (UJ) because the IS area count for the quantitating IS was less than 50% but greater than 10% in relation to the previous continuing calibration.

Fifty-six VOC results were qualified as estimated not detected (UJ) because the quantitating IS area count was less than 10% of the expected value.

A total of 113 PCB results were qualified as estimated (J) because the multicomponent standard was not analyzed within 72 h of the initial analysis.

D-3.1.7 Analyte Identification

One SVOC results and 45 VOC results were qualified as not detected (U) because the associated mass spectrum did not meet method specifications.

Thirty dioxin/furan results were qualified as not detected (U) because the analyte was detected in a sample, and the result was not confirmed on a second column with successful analysis of the gas chromatography (GC) column performance mix.

D-3.1.8 Method and Preparation Blanks

Three SVOC results were qualified as estimated (J) because the analyte was identified in the method blank but was greater than 5 times the amount in the method blank.

Ten VOC results were qualified as estimated (J) because the analyte was identified in the method blank but was greater than 5 times the amount in the method blank.

Forty-six dioxin/furan results, 53 SVOC results, and 567 VOC results were qualified as not detected (U) because the sample result was less than or equal to five times the concentration of the related analyte in the method blank.

A total of 159 VOC results were qualified as not detected (U) because the sample result was less than or equal to 5 times the concentration of the related analyte in the trip blank or equipment rinsate blank.

Seventy-six dioxin/furan results were qualified as estimated (J) because the sample result was less than or equal to 5 times the concentration of the related analyte in the method blank.

D-3.1.9 Surrogate Recoveries and Internal Standard Responses

Nine total petroleum hydrocarbon-diesel range organics (TPH-DRO) results were qualified as estimated not detected (UJ) because the surrogate was less than the LAL but greater than or equal to 10% R.

One TPH-gasoline range organics (GRO) result and 7 VOC results was qualified as estimated and biased high (J+) because the surrogate %R value was greater than the UAL.

Four VOC results were qualified as estimated and biased high (J+) because the surrogate was less than 10% R.

Twenty-eight PCB results and two SVOC results were qualified as estimated and biased low (J-) because the surrogate was less than the LAL but greater than or equal to 10% R.

One VOC results was qualified as estimated not detected (UJ) because at least one surrogate was above the UAL and one surrogate was below the LAL.

A total of 275 SVOC results and 171 VOC results were qualified as estimated not detected (UJ) because the surrogate was below the LAL but greater than or equal to 10% R.

A total of 161 PCB results and 231 pesticide results were qualified as estimated not detected (UJ) because the associated surrogate was recovered below the lower acceptance limit but greater than or equal to 10% R.

D-3.1.10 Laboratory Control Sample Recoveries

Five PCB results, one SVOC result, and one VOC result were qualified as estimated and biased high (J+) because the LCS percent recovery was greater than the UAL.

Six SVOC results were qualified as estimated and biased low (J-) because the LCS percent recovery was less than the LAL but greater than 10%.

Fifty-eight SVOC results and 104 VOC results were qualified as estimated not detected (UJ) because the LCS percent recovery was less than the LAL but greater than 10%.

Two explosive compounds results were qualified as estimated not detected (UJ) because the LCS documentation was missing.

D-3.1.11 Rejected Results

Two PCB results and 15 SVOC results were rejected because the surrogate %R was less than 10%.

Thirty-three PCB results, 26 SVOC results, and 1 VOC result were rejected because the results were not analyzed with a valid 5-point calibration curve and/or a standard at the reporting limit.

Seventy SVOC results were rejected because the LCS percent recovery was less than10%.

Eleven SVOC results were rejected because the associated IS area counts were less than 50% but greater than 10% R when compared to the area counts in the applicable continuing calibration standard.

Five hundred twenty-one VOC results were rejected because the associated RRF was less than 0.05.

D-4.0 RADIOCHEMICAL ANALYSIS SUMMARY

A total of 714 samples (plus 79 field duplicates) collected within the Upper Los Alamos Canyon Aggregate Area were analyzed for radionuclides. A total of 652 samples (plus 73 field duplicates) were analyzed for americium-241; 695 samples (plus 78 field duplicates) were analyzed for gamma-emitting radionuclides; 707 samples (plus 77 field duplicates) were analyzed for tritium; 713 samples (plus 79 field duplicates) were analyzed for isotopic plutonium; 707 samples (plus 79 field duplicates) were analyzed for isotopic uranium; and 639 samples (plus 73 field duplicates) were analyzed for strontium-90. The analytical methods used for radionuclides are listed in Table D-4.0-1.

D-4.1 Radionuclide QA/QC Summary

The precision and bias of radiochemical analyses performed at off-site fixed laboratories were assessed using MS samples, LCSs, method blanks, duplicates, and tracers. The analytical services SOW (LANL 2000, 071233) specifies that spike sample recoveries should be within ±25% of the certified value. LCSs were analyzed to assess the accuracy of radionuclide analyses. The LCSs serve as a monitor of the overall performance of each step during the analysis, including the radiochemical separation preparation. The analytical services SOW (LANL 2000, 071233) specifies that LCS recoveries should be within ±20% of the certified value. The analytical services SOW (LANL 2000, 071233) specify that the method blanks are used to assess instrument background. The analytical services SOW (LANL 2000, 071233) specifies that duplicate determinations shall agree when the 95% confidence level uncertainties are considered; that is, the replicate error ratio shall be less than 1. The analytical services SOW (LANL 2000, 071233) specifies tracer results shall be 50% to 105%, and the concentration of the tracer material shall result in a maximum of 10% uncertainty in a 95% confidence level in the measured recovery.

Radionuclides with reported values less than the minimum detectable concentration (MDC) were qualified as not detected (U) per SOP-5166, Routine Validation of Chemical Separation Alpha Spectrometry, Gas Proportional Counting, and Liquid Scintillation Data.

A total of 624 americium-241 results, 4474 gamma-emitting radionuclide results, 711 tritium results, 1146 isotopic plutonium results, 406 isotopic uranium results, and 589 strontium-90 results were qualified as not detected (U) because the associated sample concentration was less than the MDC.

Each radionuclide result was also compared with the corresponding 1 sigma total propagated uncertainty (TPU). If the result was not greater than 3 times the TPU, the radionuclide was qualified as not detected (U).

Sixty americium-241 results, 52 gamma-emitting radionuclide results, 23 tritium results, 86 isotopic plutonium results, and 245 isotopic uranium results were qualified as not detected (U) because the associated sample concentration was less than 3 times the 1-sigma total propagated uncertainty.

D-4.1.1 Maintenance of Chain of Custody

COC forms were maintained properly for all samples (Appendix E).

D-4.1.2 Sample Documentation

All samples were properly documented in SCL/COCs in the field (Appendix E).

D-4.1.3 Sample Dilutions

No qualifiers were assigned because of sample dilutions of any samples analyzed for radionuclides.

D-4.1.4 Sample Preservation

Preservation criteria were met for all samples analyzed for radionuclides.

D-4.1.5 Holding Times

Holding times were met as required for all samples analyzed for radionuclides.

D-4.1.6 Analyte Identification

Certain gamma spectroscopy analytes are subject to spectral interference from energies of other radionuclides. When this occurs, it is not possible to reliably measure these radionuclides.

No qualifiers were assigned to any radionuclide results because of spectral interference.

D-4.1.7 Method and Preparation Blanks

Five tritium results, 10 isotopic plutonium results, and 25 isotopic uranium results were qualified as not detected (U) because the sample result was less than or equal to 5 times the concentration of the related analyte in the method blank.

Two americium-241 results, 16 isotopic plutonium results, and 221 isotopic uranium results were qualified as estimated (J) because the analyte was identified in the method blank but was greater than 5 times the concentration in the method blank.

D-4.1.8 Matrix Spikes

Three strontium-90 results were qualified as estimated and biased low (J-) because the associated MS recovery was less than 10%.

Seventy-six strontium-90 results were qualified as estimated not detected (UJ) because the associated MS recovery was less than 10%.

Twenty-five strontium-90 results were qualified as estimated not detected (UJ) because the associated MS recovery was above the UAL.

D-4.1.9 Carrier and Tracer Recoveries

Eight isotopic uranium results were qualified as estimated and biased high (J+) because the tracer %R was greater than the UAL.

D-4.1.10 Laboratory Control Sample Recoveries

Eighteen isotopic uranium results were qualified as estimated and biased high (J+) because the LCS %R was greater than the UAL.

D-4.1.11 Laboratory and Field Duplicates

Two americium-241 results were qualified as estimated (J) because the duplicate sample was not prepared and/or analyzed with the samples for unspecified reasons, and the duplicate information was missing.

D-4.1.12 Rejected Results

Eight gamma-emitting radionuclide results and 23 isotopic uranium results were rejected because MDC documentation was missing.

Two gamma-emitting radionuclide results were rejected because spectral interference prevented positive identification of the analyte.

Two isotopic plutonium results were rejected because the associated matrix spike recovery was less than 10%.

D-5.0 REFERENCES

The following list includes all documents cited in this appendix. 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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LANL (Los Alamos National Laboratory), December 2000. "University of California, Los Alamos National Laboratory (LANL), I8980SOW0-8S, Statement of Work for Analytical Laboratories," Rev. 1, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2000, 071233)

Table D-2.0-1
Analytical Methods for Inorganic Chemical Analyses

Analytical Method	Analytical Description	Analytical Suite
EPA Method 300.0	Ion chromatography	Anions
SW-846: 8321A	High-performance liquid chromatography (HPLC)/mass spectrometry	Anions, perchlorate
SW-846:6850	HPLC/mass spectrometry	Perchlorate
SW-846: 6010/6010A/6010B	Inductively coupled plasma emission spectroscopy (ICPES)—atomic emission spectroscopy (AES)	Aluminum, antimony, arsenic, barium, beryllium, boron, calcium, cadmium, cobalt, chromium, copper, iron, lead, lithium, magnesium, manganese, mercury, nickel, potassium, selenium, silicon, sodium, silver, thallium, titanium, uranium, vanadium, and zinc. (TAL metals)
SW-846:6020	Inductively coupled plasma mass spectroscopy (ICPMS)	TAL metals
EPA SW-746:7421	Colorimetric method	Lead
EPA SW-746:7470, 7470A	Cold vapor atomic absorption (CVAA)	Mercury
EPA SW-746:7740	Graphite furnace atomic absorption (GFAA)	Selenium
EPA SW-746:7841	GFAA	Thallium
SW-846:7060	GFAA	Arsenic
SW-846:9010A	distillation/ultraviolet spectrophotometry	Cyanide (total)
SW-846:9012A	Colorimetric method	Cyanide (total)
SW-846:7471A	GFAA	Mercury

Table D-3.0-1
Analytical Methods for Organic Chemical Analysis

Analytical Method	Analytical Description	Target Compound List
EPA SW-846:8321A_MOD	Explosives	Explosive compounds (LANL 2000, 071233)
EPA SW-846:8270C	Gas chromatography/mass spectrometry (GC/MS)	SVOCs: Analytical service SOW (LANL 2000, 071233).
EPA Method 3540–Extraction EPA SW-846:8270–Analysis	GC/MS	SVOCs: Analytical service SOW (LANL 2000, 071233).
EPA SW-846:8260, 8260B–Analysis	GC/MS	VOCs: Analytical service SOW (LANL 2000, 071233).
EPA SW-846:8081, 8081A	GC	Pesticides
SW-846:8290– Analysis	High-resolution GC/high-resolution	Dioxins, furans: Analytical service SOW (LANL 2000, 071233).
EPA SW-846:8015M_EXTRACTABLE EPA SW-846:8015M_PURGEABLE	GC/flame ionization detector	TPH-DRO TPH-GRO
EPA Method 3540–Extraction EPA SW-846:8082–Analysis	GC	PCBs

Table D-4.0-1
Analytical Methods for Radiochemical Analyses

Analytical Method	Analytical Description	Target Compound List
HASL-300: Am-241	Alpha spectroscopy	Americium-241
EPA method: 901.1 Generic: Gamma Spec	Gamma Spectroscopy	Americium-241, cesium-137, cesium-134, cobalt-60, europium-152, ruthenium-106, sodium-22, uranium-235
EPA method: 906.0	Liquid scintillation	Tritium
HASL-300: ISOPU	Alpha spectroscopy, gas-flow proportional counting	Isotopic plutonium
HASL-300: ISOU	Alpha spectroscopy, gas-flow proportional counting	Isotopic uranium
EPA method: 905.0 ASTM:D5811-95M	Gas-flow proportional counting	Strontium-90

Appendix E

Analytical Suites and Results and Analytical Reports
(on DVDs included with this document)

Appendix F

Data Review

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F-1.0 INTRODUCTION

Data discussed in this appendix are the analytical results from samples collected during the investigations of the solid waste management units (SWMUs), areas of concern (AOCs), and consolidated units in the Upper Los Alamos Canyon Aggregate Area. Samples were shipped through the Sample Management Office (SMO) to off-site contract laboratories for analyses, and are accompanied by full chain-of-custody and quality documentation. The resulting data are decision-level data and are used to determine nature and extent, calculate exposure point concentrations, and conduct risk screening assessments. Data collected during the 2008–2009 investigation were combined with data collected previously where available and where the previous data met current data quality requirements. Complete data sets for all sites investigated are provided on the DVDs included in Appendix E of this report. Analytical data packages, sample collection logs, and chain-of-custody forms are also provided in Appendix E.

Analytical methods used and data quality assessments, including assignment of data qualifiers, are discussed in Appendix D. All data qualifiers used are defined in Appendix A.

F-1.1 Overview of Analytical Data

At a few sites, decision-level data had been collected before 2008: samples were collected at SWMU 00-017 in 1998; at four TA-32 sites [SWMU 32-001, SWMU 32-002(a), SWMU 32-002(b), and AOC 32-004] in 1996; and at SWMU 41-001 in 1995. The historical investigation report (LANL 2006, 091916) and the investigation work plan (LANL 2006, 091916) for Upper Los Alamos Canyon Aggregate Area included more historical data than described above. Data that did not meet the re-validation criteria after the submission of the Reports in 2006 are not considered decision-level data for this report and, therefore, are not included for evaluation. A total of 47 sites were sampled during the 2008–2009 investigation, and all resulting data were decision-level. The data review described in this appendix includes all decision-quality data available for each site.

F-1.2 Identification of Chemicals of Potential Concern

The purpose of the data review is to identify chemicals of potential concern (COPCs) for each site (SWMU, AOC, or consolidated unit) in the Upper Los Alamos Canyon Aggregate Area. Inorganic COPCs are identified by comparing site data with background values (BVs) and maximum concentrations in a background data set (LANL 1998, 059730). Organic chemicals have no BVs and are identified as COPCs based on detection status. Radionuclides are identified as COPCs based on background comparisons if a BV or a fallout value (FV) is available, or based on detection status if no BV or FV is available.

Sample media encountered in this investigation include soil (all soil horizons, designated by the media code ALLH or SOIL); fill material (media code FILL); alluvial sediment (media code SED), and Bandelier Tuff (media codes Qbt 1g, Qbt 2, Qbt 3, and Qbt 4). Because no separate BVs are available for fill material, fill samples are evaluated by comparison to soil BVs (LANL 1998, 059730). In this report, the discussions of site contamination in soil include fill samples with soil samples in sample counts and comparisons to background. Fill samples are not discussed separately from soil.

Background data are generally available for soil, sediment, and tuff (LANL 1998, 059730). However, some analytes (e.g., nitrate, perchlorate, and hexavalent chromium) have no BVs. A BV may be either a calculated value from the background data set (upper tolerance limit or the 95% upper confidence bound on the 95th quantile) or a detection limit (DL). When a BV is based on a DL, there is no corresponding background data set for that analyte/media combination.

For inorganic chemicals, data are evaluated by sample media to facilitate the comparison with media-specific background data. To identify inorganic COPCs, the first step is to compare the sample result with the BV. If sample results are above the BV and sufficient data are available (10 or more sample results), statistical tests are used to compare the site sample data to the background data set for the appropriate media. If statistical tests cannot be performed because of insufficient data or a high percentage of nondetects (see section F-1.2.1) the sample results are compared only to the greater of the BV or the maximum background concentration of the chemical in the appropriate media. If any sample results are above the BV or maximum background concentration, the chemical is identified as a COPC. The same evaluation is performed using sample DLs when a constituent is not detected but has DLs above the BV. If no BV is available, detected inorganic chemicals are identified as COPCs.

Four inorganic chemicals, calcium, magnesium, potassium, and sodium, receive additional consideration if they are detected above their BVs. These inorganic chemicals are essential nutrients that are common in the natural environment. For this reason, they are not identified as COPCs if they are detected infrequently above background or slightly above background concentrations (generally less than 2–3 times the maximum background concentration), particularly if they are not likely to have been associated with historical Los Alamos National Laboratory (LANL or the Laboratory) activities at the site.

Radionuclides are identified as COPCs based on comparisons to BVs for naturally occurring radionuclides or to FVs for fallout radionuclides. Isotopic thorium and isotopic uranium are naturally occurring radionuclides. Americium-241, cesium-137, plutonium-238, plutonium-239/240, strontium-90, and tritium are fallout radionuclides. FVs apply only to surface samples (0–0.5 ft below ground surface [bgs]), so fallout radionuclides detected below 0.5 ft bgs are identified as COPCs.

The FV for tritium in surface soil (LANL 1998, 059730) is in units of picocuries per milliliter (pCi/mL). When this FV is used, sample percent moisture must be used to convert sample tritium data from picocuries per gram (pCi/g) (as provided by analytical laboratories) to the corresponding values in units of pCi/mL. Because sample percent moisture historically has been determined using a variety of methods that were often undocumented, the Laboratory has adopted the conservative approach of identifying tritium in soil as a COPC based on detection status.

The FVs for fallout radionuclides in tuff (LANL 1998, 059730) are nominal DLs, not measured concentrations from tuff samples. Therefore, the FVs are not used for tuff samples, and fallout radionuclides in tuff are identified as COPCs based on detection status.

Chemicals are COPCs for an entire site if they are identified as COPCs for any medium sampled at the site. The identification of COPCs for each site is discussed in the following sections.

F-1.2.1 Overview of Statistical Methods

A variety of statistical methods may be applied to each of the data sets, but generally include distributional comparisons and box plots comparing site data to background data. In cases where no background data are available, fewer than 10 samples were analyzed for a specific constituent, or more than 80 percent of the site samples and background samples are nondetects, statistical tests are not valid. In such cases, COPC identification is based on detection status, direct comparison to the BV or FV (if one is available), and subsequent comparison to the maximum background concentration if it is greater than the BV or FV. If no BV or FV is available, the constituent is identified as a COPC if it was detected in any samples at the site.

Comparisons between site (SWMU, AOC or consolidated unit) data sets and the Laboratory background datasets, are performed using statistical methods. For background comparisons, these methods begin

with a simple comparison of site-specific data to media-specific BVs or FVs (LANL 1998, 059730). BV/FV comparisons are followed, when appropriate, by statistical tests that evaluate potential differences between the distributions. These tests are used for testing hypotheses about data from two potentially different distributions, e.g., a test of the hypothesis that site concentrations are elevated above background levels.

Nonparametric tests that are most commonly performed include the two-sample Wilcoxon Rank Sum test (Wilcoxon test), the Gehan test (modification of the Wilcoxon test), and the quantile test (Gehan 1965, 055611; Gilbert and Simpson 1990, 055612). The Gehan test is best suited for assessing complete shifts in distributions, and accounts for nondetected concentrations at multiple DLs in a statistically robust manner. If there are no nondetected concentrations in the data, the Gehan test is equivalent to the Wilcoxon test. The quantile test is better suited for assessing shifts of a subset of the data. Most types of differences between distributions can be identified. Occasionally, if the differences between two distributions appear to occur far into the tails, the slippage test might be performed. This test evaluates the potential for some of the site data to be greater than the maximum concentration in the background data set if, in fact, the site data and background data came from the same distribution. Observed significance levels (p-values) are obtained from the Gehan, quantile, or slippage tests. If a p-value is less than a specified probability, e.g., 0.05 (a nominal significance level), then there is some reason to suspect that there is a difference between the distributions. If the p-value is greater than 0.05, no difference is indicated. The standard set of tests is run whenever the detection rate for both the site data set and the Laboratory background data set is greater than 50%; if there are fewer than 50% detections in either set, then the Gehan test is not applicable. If all sample data are nondetects, statistical tests are not performed.

Paired tests are used to test whether site data are different than background. Specifically, the Gehan test (or the Wilcoxon Rank Sum test if all sample results are detects) is the preferred initial test. If the result of the Gehan test indicates ($p > 0.05$) that the site data are not significantly different than background, the quantile test is performed. Site data must pass (i.e., $p > 0.05$) both tests to be eliminated as a COPC. If the p-value from either the Gehan (or Wilcoxon) or the quantile test is less than 0.05, the constituent is identified as a COPC for the specific medium tested. If the Gehan test is not applicable because either the site or background data set includes more than 50 percent nondetects, the quantile test is performed first. If the p-value from the quantile test is > 0.05, the slippage test is performed next. Again, the p-value from both tests must be > 0.05 for the constituent to be eliminated as a COPC. If the p-value from the first test is > 0.05, indicating the site data are different than background, the second test need not be performed, and the constituent is identified as a COPC.

Box plots provide a visual representation of the data and may identify the presence of outliers or other anomalous data that might affect statistical results and interpretations. The plots allow a visual comparison between site and background concentration distributions. The plots are generally used in conjunction with the statistical tests (distributional comparisons) described above. A box plot consists of a box, a line across the box, whiskers (lines extended beyond the box and terminated with a short perpendicular line), and points outside the whiskers. The box area of the plot is the region between the 25th percentile and the 75th percentile of the data, which is the interquartile range or middle half of the data. The horizontal line within the box represents the median (50th percentile) of the data. The whiskers give an interval of 1.5 times the interquartile range, outside of which data may be evaluated for their potential to be outliers. The concentrations of individual samples are plotted as points overlaying the box plot. When a data set contains both detected and nondetected concentrations reported as detection limits (DLs), the detected concentrations are plotted as Xs, and the nondetected concentrations are plotted as Os. The medium-specific background value is also illustrated by a dashed line in each box plot.

F-2.0 COPCs FOR SITES AT TA-00

F-2.1 SWMU 00-017

A total of 58 samples (21 soil/fill, 30 tuff, and 7 sediment) were collected in 1998–1999 and 2008–2009 from 32 locations at SWMU 00-017. Table 5.3-1 of the investigation report summarizes the samples collected and the requested analyses for each sample. Plate 5.3-1 is the site map showing sampling locations.

F-2.1.1 Inorganic Chemicals at SWMU 00-017

All 58 samples from SWMU 00-017 were analyzed for inorganic chemicals. Fifty-three samples were analyzed for target analyte list (TAL) metals, 5 samples for lead only, and 30 samples for nitrate and perchlorate. Table 5.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.3-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown on Plate 5.3-1.

F-2.1.1.1 Inorganic Chemicals in Soil

Twenty-one soil and fill samples were collected at SWMU 00-017. Sixteen samples were analyzed for TAL metals, and an additional five samples were analyzed for lead only. Fifteen samples were analyzed for nitrate and perchlorate.

Antimony was not detected, but had DLs (12–14 mg/kg) above the BV (0.83 mg/kg) and above the maximum background concentration of antimony in soil (1 mg/kg) in 14 of 16 soil and fill samples. Antimony is identified as a COPC in soil.

Cadmium was not detected, but had DLs (0.56–0.68 mg/kg) above the BV (0.4 mg/kg) in 15 of 16 soil and fill samples. None of the DLs exceeded the maximum background concentration of cadmium in soil (2.6 mg/kg). Cadmium is not identified as a COPC in soil.

Chromium was detected above the BV (19.3 mg/kg) in 1 of 16 soil and fill samples, at a concentration of 34 mg/kg. The sample concentration did not exceed the maximum background concentration of chromium in soil (36.5 mg/kg). Statistical tests were performed to determine if the site sample results for chromium are different than background. The statistical test results are presented in Table F-2.1-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for chromium in soil is presented in Figure F-2.1-1. Chromium is not identified as a COPC in soil.

Total cyanide was detected above the BV (0.5 mg/kg) in 1 of 16 soil and fill samples, at a concentration of 1.6 mg/kg. Total cyanide also had DLs (0.56–0.68 mg/kg) above the BV in the other 14 of 16 soil and fill samples. Results were compared only to the BV because a background dataset for total cyanide in soil is not available. Total cyanide is identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) in 5 of 21 soil and fill samples, with a maximum concentration of 390 mg/kg. Four of the five sample results also exceeded the maximum background concentration of lead in soil (28 mg/kg). Statistical tests were performed to determine if the site sample results for lead are different than background. The statistical test results are presented in Table F-2.1-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not

statistically different than background. The box plot for lead in soil is presented in Figure F-2.1-2. Lead is not identified as a COPC in soil.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in soil (0.1 mg/kg) in 5 of 16 soil and fill samples, with a maximum concentration of 3.4 mg/kg. Mercury also had DLs (0.11–0.13 mg/kg) above the BV and the maximum background concentration. Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetects. The box plot for mercury in soil is presented in Figure F-2.1-3. Mercury is identified as a COPC in soil.

Silver was not detected, but had DLs (2.2–2.7 mg/kg) above the BV (1 mg/kg) in 15 of 16 soil and fill samples. Results were compared only to the BV because a background dataset for silver in soil is not available. Silver is identified as a COPC in soil.

Thallium was not detected above the BV (0.73 mg/kg), but had DLs (2.2–2.6 mg/kg) above the BV (0.73 mg/kg) and above the maximum background concentration of thallium in soil (1 mg/kg) in 9 of 16 soil and fill samples. Thallium is identified as a COPC in soil and fill.

F-2.1.1.2 Inorganic Chemicals in Tuff

Thirty tuff samples were collected at SWMU 00-017. All 30 samples were analyzed for TAL metals, and 12 samples were analyzed for nitrate and perchlorate.

Aluminum was detected above the BV (7340 mg/kg) and above the maximum background concentration of aluminum in tuff (8370 mg/kg) in 10 of 30 tuff samples, with a maximum concentration of 21000 mg/kg. Statistical tests were performed to determine if the site sample results for aluminum are different than background. The statistical test results are presented in Table F-2.1-2. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for aluminum in tuff is presented in Figure F-2.1-4. Aluminum is not identified as a COPC in tuff.

Antimony was not detected, but had DLs (12–14 mg/kg) above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in 18 of 30 tuff samples. Antimony is identified as a COPC in tuff.

Arsenic was detected above the BV (2.79 mg/kg) in 15 of 30 tuff samples, with a maximum concentration of 4.5 mg/kg. None of the 15 results exceeded the maximum background concentration of arsenic in tuff (5 mg/kg). Statistical tests were performed to determine if the site sample results for arsenic are different than background. The statistical test results are presented in Table F-2.1-2. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for arsenic in tuff is presented in Figure F-2.1-5. Arsenic is identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) and above the maximum background concentration of barium in tuff (51.6 mg/kg) in 10 of 30 tuff samples, with a maximum concentration of 130 mg/kg. Statistical tests were performed to determine if the site sample results for barium are different than background. The statistical test results are presented in Table F-2.1-2. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for barium in tuff is presented in Figure F-2.1-6. Barium is identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in 5 of 30 tuff samples, with a maximum concentration of 1.6 mg/kg. All sample concentrations were less than the maximum background concentration of

beryllium in tuff (1.8 mg/kg). Statistical tests were performed to determine if the site sample results for beryllium are different than background. The statistical test results are presented in Table F-2.1-2. The result of the Gehan test indicates that the site sample results are not statistically different than background, while the result of the quantile test indicates that the site sample results are statistically different than background. The box plot for beryllium in tuff is presented in Figure F-2.1-7. Beryllium is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum background concentration of calcium in tuff (2230 mg/kg) in 5 of 30 tuff samples, with a maximum concentration of 2800 mg/kg. Statistical tests were performed to determine if the site sample results for calcium are different than background. The statistical test results are presented in Table F-2.1-2. The result of the Gehan test indicates that the site sample results are statistically different than background. However, all sample concentrations are less than twice the BV. Based on EPA's Risk Assessment Guidance for Superfund, section 5.9.4, page 5-23, calcium may be eliminated as a COPC if detected infrequently above background (5 of 30 tuff samples) and not substantially above background. The box plot for calcium in tuff is presented in Figure F-2.1-8. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 17 of 30 tuff samples, with a maximum concentration of 23.6 mg/kg. Five of the 17 sample results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). Statistical tests were performed to determine if the site sample results for chromium are different than background. The statistical test results are presented in Table F-2.1-2. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for chromium in tuff is presented in Figure F-2.1-9. Chromium is identified as a COPC in tuff.

Cobalt was detected above the BV (3.14 mg/kg) and above the maximum background concentration of cobalt in tuff (also 3.14 mg/kg) in 7 of 30 tuff samples, with a maximum concentration of 7.2 mg/kg. Statistical tests were performed to determine if the site sample results for cobalt are different than background. The statistical test results are presented in Table F-2.1-2. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for cobalt in tuff is presented in Figure F-2.1-10. Cobalt is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) and above the maximum background concentration of copper in tuff (6.2 mg/kg) in 7 of 30 tuff samples, with a maximum concentration of 10 mg/kg. Statistical tests were performed to determine if the site sample results for copper are different than background. The statistical test results are presented in Table F-2.1-2. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for copper in tuff is presented in Figure F-2.1-11. Copper is identified as a COPC in tuff.

Total cyanide was not detected, but had DLs (0.52–0.68 mg/kg) above the BV (0.5 mg/kg) in 28 of 30 tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Iron was detected above the BV (14,500 mg/kg) in 7 of 30 tuff samples, with a maximum concentration of 17,000 mg/kg. None of the results exceeded the maximum background concentration (19,500 mg/kg). Statistical tests were performed to determine if the site sample results for iron are different than background. The statistical test results are presented in Table F-2.1-2. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for iron in tuff is presented in Figure F-2.1-12. Iron is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 17 of 30 tuff samples, with a maximum concentration of 17.8 mg/kg. Thirteen of the 17 sample results also exceeded the maximum background concentration of lead in tuff (15.5 mg/kg). Statistical tests were performed to determine if the site sample results for lead are different than background. The statistical test results are presented in Table F-2.1-2. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for lead in tuff is presented in Figure F-2.1-13. Lead is identified as a COPC in tuff.

Magnesium was detected above the BV (1690 mg/kg) in 9 of 30 tuff samples, with a maximum concentration of 3000 mg/kg. One sample result exceeded the maximum background concentration of magnesium in tuff (2820 mg/kg). Statistical tests were performed to determine if the site sample results for magnesium are different than background. The statistical test results are presented in Table F-2.1-2. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for manganese in tuff is presented in Figure F-2.1-14. Magnesium is identified as a COPC in tuff.

Mercury was not detected above the BV (0.1 mg/kg), but had DLs (0.12–0.14 mg/kg) above the BV in 17 of 30 tuff samples. Results were compared only to the BV because a background dataset for mercury in tuff is not available. Mercury is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in 12 of 30 tuff samples, with a maximum concentration of 11.7 mg/kg. Eleven of 12 sample results also exceeded the maximum background concentration of nickel in tuff (7 mg/kg). Statistical tests were performed to determine if the site sample results for nickel are different than background. The statistical test results are presented in Table F-2.1-2. The result of the quantile test (the Gehan test is not appropriate because the background dataset has more than 50% nondetects) indicates that the site sample results are statistically different than background. The box plot for nickel in tuff is presented in Figure F-2.1-15. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in at least one tuff sample and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was detected above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in 1 of 30 tuff samples, at a concentration of 0.37 mg/kg. Selenium also had DLs (0.62–1.4 mg/kg) above the BV in 18 of 30 tuff samples. Statistical tests were not performed because the background data of selenium in Qbt 2,3,4 tuff are all nondetects. The box plot for selenium in tuff is presented in Figure F-2.1-16. Selenium is identified as a COPC in tuff.

Silver was not detected above the BV (1 mg/kg), but had DLs (2.3–2.7 mg/kg) above the BV and above the maximum background concentration of silver in tuff (1.9 mg/kg) in 18 of 30 tuff samples. Silver is identified as a COPC in tuff.

Thallium was not detected above the BV (1.1 mg/kg), but had DLs (2.4–2.6 mg/kg) above the BV and above the maximum background concentration of thallium in tuff (1.7 mg/kg) in 10 of 30 tuff samples. Thallium is identified as a COPC in tuff.

Vanadium was detected above the BV (17.0 mg/kg) in 4 of 30 tuff samples, with a maximum sample concentration of 20 mg/kg. None of the sample results exceeded the maximum background concentration of vanadium in tuff (21 mg/kg). Statistical tests were performed to determine if the site sample results for vanadium are different than background. The statistical test results are presented in Table F-2.1-2. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for vanadium in tuff is presented in Figure F-2.1-17. Vanadium is identified as a COPC in tuff.

F-2.1.1.3 Inorganic Chemicals in Sediment

Seven sediment samples were collected at SWMU 00-017. All seven samples were analyzed for TAL metals, and three samples were analyzed for nitrate and perchlorate.

Antimony was not detected above the BV (0.83 mg/kg), but had DLs (11–12 mg/kg) in four of seven sediment samples. Results were compared only to the BV because a background dataset for antimony in sediment is not available. Antimony is identified as a COPC in sediment.

Cadmium was detected above the BV (0.4 mg/kg) and above the maximum background concentration of cadmium in sediment (0.18 mg/kg) in one of seven sediment samples, at a concentration of 0.49 mg/kg. Cadmium also had DLs (0.57–0.6 mg/kg) above the BV. The box plot for cadmium in sediment is presented in Figure F-2.1-18. Cadmium is identified as a COPC in sediment.

Lead was detected above the BV (19.7 mg/kg) in all seven sediment samples, with a maximum concentration of 450 mg/kg. Six of seven samples results also exceeded the maximum background concentration of lead in tuff (25.6 mg/kg). The box plot for lead in sediment is presented in Figure F-2.1-19. Lead is identified as a COPC in sediment.

Mercury was not detected above the BV (0.1 mg/kg), but had DLs (0.11–0.12 mg/kg) above the BV and above the maximum background concentration of mercury in sediment (0.03 mg/kg) in four of seven sediment samples. Mercury is identified as a COPC in sediment.

Selenium was not detected, but had DLs (0.54–1.2 mg/kg) above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in sediment (0.1 mg/kg) in all seven sediment samples. Selenium is identified as a COPC in sediment.

Silver was detected above the BV (1 mg/kg) in one of seven sediment samples, with a concentration of 1.2 mg/kg. Silver also had DLs (2.3–2.4 mg/kg) above the BV and above the maximum background concentration of silver in sediment (0.28 mg/kg) in four of seven sediment samples. The box plot for silver in sediment is presented in Figure F-2.1-20. Silver is identified as a COPC in sediment.

Thallium was not detected, but had DLs (2.3–2.4 mg/kg) above the BV (0.73 mg/kg) in four of seven sediment samples. Results were compared only to the BV because a background dataset for thallium in sediment is not available. Thallium is identified as a COPC in sediment.

F-2.1.2 Organic Chemicals at SWMU 00-017

Thirty-seven samples from 21 locations were collected at SWMU 00-017 and analyzed for organic chemicals. All 37 samples were analyzed for semivolatile organic compounds (SVOCs), volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), and pesticides. Table 5.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.3-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 5.3-2.

F-2.1.2.1 Organic Chemicals in Soil

Twenty-one soil and fill samples were collected at SWMU 00-017. Fifteen samples were analyzed for SVOCs, VOCs, PCBs, and pesticides.

Only one organic chemical (Aroclor-1254) was detected in a single fill sample. Aroclor-1254 is identified as a COPC in soil and fill.

F-2.1.2.2 Organic Chemicals in Tuff

Thirty tuff samples were collected at SWMU 00-017. Eighteen samples were analyzed for SVOCs, VOCs, PCBs, and pesticides.

No organic chemicals were detected in tuff samples at SWMU 00-017.

F-2.1.2.3 Organic Chemicals in Sediment

Seven sediment samples were collected at SWMU 00-017. Four of those samples were analyzed for SVOCs, VOCs, PCBs, and pesticides.

No organic chemicals were detected in sediment samples at SWMU 00-017.

F-2.1.3 Radionuclides at SWMU 00-017

Fifty-two samples were collected from 26 locations at SWMU 00-017 and analyzed for radionuclides. Fifteen samples were analyzed for americium-241, 51 for gamma-emitting radionuclides and tritium, 52 for isotopic plutonium and isotopic uranium, and 15 for strontium-90. Table 5.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.3-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown on Plate 5.3-3.

F-2.1.3.1 Radionuclides in Soil

Twenty-one soil and fill samples were collected at SWMU 00-017. Fifteen samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium.

Americium-241 was detected in two fill samples at depths where the FV does not apply, with concentrations of 3.5 and 1.33 pCi/g. Americium-241 is identified as a COPC in soil.

Cesium-137 was detected in three fill samples at depths where the FV does not apply, with a maximum concentration of 3.27 pCi/g. Cesium-137 is identified as a COPC in soil.

Plutonium-238 was detected in three fill samples at depths where the FV does not apply, with a maximum concentration of 0.165 pCi/g. Plutonium-238 is identified as a COPC in soil.

Plutonium-239/240 was detected in seven soil and fill samples at depths where the FV does not apply, with a maximum concentration of 12.85 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

Tritium was detected in three soil samples with a maximum concentration of 0.22 pCi/g, and has no soil FV. Tritium is identified as a COPC in soil.

F-2.1.3.2 Radionuclides in Tuff

Thirty tuff samples were collected at SWMU 00-017. Thirty samples were analyzed for isotopic plutonium and isotopic uranium, 29 for gamma-emitting radionuclides and tritium, and 12 for americium-241 and strontium-90.

Americium-241 was detected in 2 of 12 tuff samples with concentrations of 0.587 and 0.206 pCi/g, and has no tuff FV. Americium-241 is identified as a COPC in tuff.

Cesium-137 was detected in 1 of 29 tuff samples at a concentration of 0.125 pCi/g, and has no tuff FV. Cesium-137 is identified as a COPC in tuff.

Plutonium-239/240 was detected in 5 of 30 tuff samples with a maximum concentration of 2.39 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

Tritium was detected in 1 of 29 tuff samples at a concentration of 0.07 pCi/g, and has no tuff FV. Tritium is identified as a COPC in tuff.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in 2 of 30 tuff samples, with concentrations of 0.1 and 0.172 pCi/g. Results were compared only to the BV because background dataset for uranium-235 in tuff is not available. Uranium-235/236 is identified as a COPC in tuff.

F-2.1.3.3 Radionuclides in Sediment

Seven sediment samples were collected at SWMU 00-017. Three samples were analyzed for americium-241 and strontium-90 and seven for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) and above the maximum background concentration of plutonium-239/240 in sediment (0.065 pCi/g) in four of seven sediment samples, with a maximum sample concentration of 0.253 pCi/g. The box plot for plutonium-239/240 is presented in Figure F-2.1-21. Plutonium-239/240 is identified as a COPC in sediment.

Tritium was detected above the FV (0.093 pCi/g) and above the maximum background concentration of tritium in sediment (0.0856 pCi/g) in two of seven sediment samples, with concentrations of 0.17 and 0.13 pCi/g. The box plot for tritium in sediment is presented in Figure F-2.1-22. Tritium is identified as a COPC in sediment.

F-2.1.4 Summary of COPCs at SWMU 00-017

The inorganic COPCs identified at SWMU 00-017 are antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, total cyanide, iron, lead, magnesium, mercury, nickel, nitrate, perchlorate, selenium, silver, thallium, and vanadium.

The only organic COPC identified at SWMU 00-017 is Aroclor-1254.

The radionuclide COPCs identified at SWMU 00-017 are americium-241, cesium-137, plutonium-238, plutonium-239/240, tritium, and uranium-235/236.

F-2.1.5 Nature and Extent of Contamination at SWMU 00-017

F-2.1.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 00-017 are antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, total cyanide, iron, lead, magnesium, mercury, nickel, nitrate, perchlorate, selenium, silver, thallium, and vanadium. Sample results are presented in Table 5.3-2 and are shown on Plate 5.3-1.

Concentrations of arsenic, beryllium, iron, magnesium, and vanadium decrease with depth or remain essentially the same with depth. All concentrations are less than 2 times the BVs, and concentrations decrease downslope to below background. Therefore, the lateral and vertical extent for arsenic, beryllium, iron, magnesium, and vanadium are defined.

Concentrations of barium, chromium, cobalt, and nickel increase with depth at multiple locations. However, all concentrations are slightly above BVs or are less than 3 times the BVs, and concentrations decrease downslope to near or below background. Therefore, the lateral and vertical extent for barium, chromium, cobalt, and nickel are defined.

Antimony and thallium were not detected at the site. Therefore, the lateral and vertical extent for antimony and thallium are defined.

Cadmium and cyanide were detected above BV only in one sample each, and the concentration decreases with depth. Therefore, the lateral and vertical extent for cadmium and cyanide are defined.

Copper was detected above BV at six locations on mesa top. Concentrations increased slightly with depth at locations 00-10132 and 00-10135, remained essentially the same with depth at locations 00-10136 and 00-10138, and decreased with depth at locations 00-10137 and 00-10139. All concentrations are less than or slightly more than twice the BV. Copper was not detected above BV in samples on the canyon slope or at the canyon bottom. Therefore, the lateral and vertical extent of copper are defined.

Lead was detected above BV in several samples at locations 00-10144, 00-10145, 00-10181, and 00-10182. However, vertical extent is defined by samples at deeper depths at locations 00-604251 and 00-604257. Vertical extent is not defined at location 00-604247 because its concentrations increase with depth. The lateral extent of lead is also not defined.

Mercury was detected above BV in five samples but was not detected above BV in samples collected at the canyon-bottom locations during this investigation. Concentrations of mercury decrease with depth. Vertical extent is defined for mercury on mesa top, and both lateral and vertical extent are defined at the canyon bottom.

Nitrate was detected in nine samples at concentrations less than 1 mg/kg except that one sample had a concentration of 5.2 mg/kg. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent for nitrate are defined.

Perchlorate was detected only in the deepest sample at location 00-604251. Perchlorate was not detected in samples from similar depths at other locations. Therefore, the lateral and vertical extent for perchlorate are defined.

Selenium and silver were detected only in one sample each. The concentration decreases with depth and downslope. Therefore, the lateral and vertical extent for selenium and silver are defined.

F-2.1.5.2 Nature and Extent of Organic COPCs

The organic COPC identified at SWMU 00-017 is Aroclor-1254. Sample results are presented in Table 5.3-3 and Plate 5.3-2.

Aroclor-1254 was detected at 0.11 mg/kg in only one sample at the site. The concentration of Aroclor-1254 decreases with depth and downslope. Therefore, the lateral and vertical extent for Aroclor-1254 are defined.

F-2.1.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs identified at SWMU 00-017 are americium-241, cesium-137, plutonium-238, plutonium-239/240, tritium, and uranium-235/236. Sample results are presented in Table 5.3-4 and Plate 5.3-3.

Concentrations of americium-241, cesium-137, plutonium-238, and plutonium-239/240 all decrease with depth and downslope. The lateral and vertical extent of these COPCs are defined.

Tritium was detected at a single depth at locations 00-10141 and 00-10143. Lateral and vertical extent are defined by samples collected during this investigation at nearby locations 00-604249 and 00-604251, where tritium was not detected.

Uranium-235/236 was detected only in two samples, one on the mesa-top and the other in the canyon-bottom, at concentrations less than twice the BV. Therefore, the lateral and vertical extent for uranium-235/236 are defined.

F-2.1.5.4 Summary of Nature and Extent for SWMU 00-017

The lateral and vertical extent for all inorganic, organic, and radionuclide COPCs are defined at SWMU 00-017, except for lead.

F-2.2 AOC 00-031(a)

A total of 16 samples (9 fill and 7 tuff) were collected during the 2008–2009 investigation from 5 locations at AOC 00-031(a). Table 5.4-1 summarizes the samples collected and the requested analyses for each sample. Figure 5.4-1 is the site map showing sampling locations.

F-2.2.1 Inorganic Chemicals at AOC 00-031(a)

All 16 samples were analyzed for TAL metals. Table 5.4-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.4-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs.

F-2.2.1.1 Inorganic Chemicals in Soil

Nine fill samples were collected and analyzed for TAL metals.

Calcium was detected above the BV (6120 mg/kg) in two of nine fill samples, with concentrations of 8070 and 8730 mg/kg. Both concentrations are below the maximum background concentration of calcium in

soil (14,000 mg/kg). The box plot for calcium in soil is presented in Figure F-2.2-1. Calcium is not identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) in one of nine fill samples, at a concentration of 28.1 mg/kg. The sample concentration is equivalent to the maximum background concentration of lead in soil (28 mg/kg). The box plot for lead in soil is presented in Figure F-2.2-2. Lead is not identified as a COPC in soil.

F-2.2.1.2 Inorganic Chemicals in Tuff

Seven tuff samples from AOC 00-031(a) were analyzed for TAL metals.

Selenium was not detected above the BV (0.3 mg/kg), but had DLs (0.53–0.54 mg/kg) above the BV and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in five of seven tuff samples. Selenium is identified as a COPC in tuff.

F-2.2.2 Organic Chemicals at AOC 00-031(a)

A total of 16 samples (9 fill and 7 tuff) were collected during the 2008–2009 investigation from five locations at AOC 00-031(a) and analyzed for organic chemicals. All 16 samples were analyzed for SVOCs, VOCs, total petroleum hydrocarbons- (TPH-) diesel range organics (DRO) and TPH-gasoline range organics (TPH-GRO). Table 5.4-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.4-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 5.4-2.

F-2.2.2.1 Organic Chemicals in Soil

Nine fill samples were collected and analyzed for SVOCs, VOCs, TPH-DRO, and TPH-GRO.

Bis(2-ethylhexyl)phthalate, 2-butanone, sec-butylbenzene, carbon disulfide, ethylbenzene, isopropylbenzene, 4-isopropyltoluene, methylene chloride, 2-methylnaphthalene, naphthalene, pentachlorophenol, 1-propylbenzene, TPH-GRO, trichlorofluoromethane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and xylene (total) were detected in one or more fill samples, and are identified as COPCs in soil.

F-2.2.2.2 Organic Chemicals in Tuff

Seven tuff samples were collected and analyzed for SVOCs, VOCs, TPH-DRO, and TPH-GRO.

Acetone, benzyl alcohol, di-n-butylphthalate, 4-isopropyltoluene, methylene chloride, trichlorofluoromethane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and xylene (total) were detected in one or more tuff samples, and are identified as COPCs in tuff.

F-2.2.3 Radionuclides at AOC 00-031(a)

Samples collected at AOC 00-031(a) were not analyzed for radionuclides in accordance with the approved work plan (LANL 2006, 091916; NMED 2006, 095460; LANL 2008, 101654). Therefore, no radionuclide COPCs are present at AOC 00-031(a).

F-2.2.4 Summary of COPCs at AOC 00-031(a)

The inorganic chemical identified as a COPC at AOC 00-031(a) is selenium.

The organic chemicals identified as COPCs at AOC 00-031(a) are acetone, benzyl alcohol, bis(2-ethylhexyl)phthalate, 2-butanone, sec-butylbenzene, carbon disulfide, di-n-butylphthalate, ethylbenzene, isopropylbenzene, 4-isopropyltoluene, methylene chloride, 2-methylnaphthalene, naphthalene, pentachlorophenol, 1-propylbenzene, TPH-GRO, trichlorofluoromethane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and xylene (total).

No radionuclide COPCs were identified because samples were not analyzed for radionuclides.

F-2.2.5 Nature and Extent of Contamination at AOC 00-031(a)

F-2.2.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPC identified at AOC 00-031(a) is selenium. Because it was not detected above BV at the site (Table 5.4-2), the lateral and vertical extent of selenium are defined.

F-2.2.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at AOC 00-031(a) are acetone, benzyl alcohol, bis(2-ethylhexyl)phthalate, 2-butanone, sec-butylbenzene, carbon disulfide, di-n-butylphthalate, ethylbenzene, isopropylbenzene, 4-isopropyltoluene, methylene chloride, 2-methylnaphthalene, naphthalene, pentachlorophenol, 1-propylbenzene, TPH-GRO, trichlorofluoromethane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and xylene (total). Sample results are presented in Table 5.4-3 and are shown in Figure 5.4-2.

The majority of detected concentrations are near or below the estimated quantitation limits (EQLs). Six organic chemicals were detected at location 00-604729: acetone; 2-butanone; carbon disulfide; methylene chloride; trichlorofluoromethane; and 1,2,4-trimethylbenzene. Concentrations decrease with depth at this location and are at low levels. Therefore, the lateral and vertical extent are defined for the organic COPCs at AOC 00-031(a).

F-2.2.5.3 Summary of Nature and Extent at AOC 00-031(a)

The lateral and vertical extent of contamination are defined for all inorganic and organic COPCs at AOC 00-031(a).

F-3.0 COPCs FOR SITES AT TA-01

F-3.1 SWMU 01-001(a)

A total of 17 samples (1 fill, 12 tuff, and 4 sediment) were collected during the 2008–2009 investigation from 8 locations at SWMU 01-001(a). Table 6.3-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.3-1 shows the site map and sampling locations.

F-3.1.1 Inorganic Chemicals at SWMU 01-001(a)

All 17 samples from SWMU 01-001(a) were analyzed for TAL metals, nitrate, cyanide (total), and perchlorate. Table 6.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.3-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.3-2.

F-3.1.1.1 Inorganic Chemicals in Soil

One fill sample was collected at SWMU 01-001(a) and analyzed for TAL metals, nitrate, cyanide (total), and perchlorate.

Total cyanide was not detected but had a DL (0.54 mg/kg) above the BV (0.5 mg/kg) in the fill sample. Results were compared only to the BV because a background dataset for total cyanide in soil is not available. Total cyanide is identified as a COPC in soil.

Nitrate and perchlorate were detected in the single fill sample at a concentration of 0.88 and 0.0045 mg/kg, respectively, and have no BVs. Nitrate and perchlorate are identified as COPCs in soil.

F-3.1.1.2 Inorganic Chemicals in Tuff

Twelve tuff samples were collected at SWMU 01-001(a) and analyzed for TAL metals, nitrate, cyanide (total), and perchlorate.

Barium was detected above the BV (46.0 mg/kg) in 2 of 12 tuff samples, with concentrations of 47 and 63.7 mg/kg. One of the sample results also exceeded the maximum background concentration of barium in tuff (51.6 mg/kg). Statistical tests were performed to determine if the site sample results for barium are different than background. The statistical test results are presented in Table F-3.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for barium in tuff is presented in Figure F-3.1-1. Barium is identified as a COPC in tuff.

Cadmium was detected above the BV (1.63 mg/kg) and above the maximum tuff background concentration (1.5 mg/kg) in 2 of 12 tuff samples, with concentrations of 4.9 and 2.2 mg/kg. Statistical tests were performed to determine if the site sample results for cadmium are different than background. The statistical test results are presented in Table F-3.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for cadmium in tuff is presented in Figure F-3.1-2. Cadmium is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum tuff background concentration (2230 mg/kg) in 1 of 12 tuff samples, at a concentration of 3740 mg/kg. Statistical tests were performed to determine if the site sample results for calcium are different than background. The

statistical test results are presented in Table F-3.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. However, the sample concentrations are less than twice the BV. Based on EPA's Risk Assessment Guidance for Superfund, section 5.9.4, page 5-23, calcium may be eliminated as a COPC if detected infrequently above background (1 of 12 tuff samples) and not substantially above background. The box plot for calcium in tuff is presented in Figure F-3.1-3. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 10 of 12 tuff samples, with a maximum concentration of 52.6 mg/kg. Seven of the ten sample results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). Statistical tests were performed to determine if the site sample results for chromium are different than background. The statistical test results are presented in Table F-3.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for chromium in tuff is presented in Figure F-3.1-4. Chromium is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 4 of 12 tuff samples, with a maximum concentration of 13.6 mg/kg. Three of the four results also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). Statistical tests were performed to determine if the site sample results for copper are different than background. The statistical test results are presented in Table F-3.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for copper in tuff is presented in Figure F-3.1-5. Copper is identified as a COPC in tuff.

Total cyanide was not detected, but had DLs (0.51–0.54 mg/kg) above the BV (0.5 mg/kg) in 3 of 12 tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 3 of 12 tuff samples, with a maximum concentration of 17.2 mg/kg. Two of the three results also exceeded the maximum background concentration of lead in tuff (15.5 mg/kg). Statistical tests were performed to determine if the site sample results for lead are different than background. The statistical test results are presented in Table F-3.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for lead in tuff is presented in Figure F-3.1-6. Lead is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in 9 of 12 tuff samples, with a maximum concentration of 26.3 mg/kg. Statistical tests were performed to determine if the site sample results for nickel are different than background. The statistical test results are presented in Table F-3.1-1. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for nickel in tuff is presented in Figure F-3.1-7. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in at least one tuff sample and have no BVs. Nitrate and perchlorate are identified as a COPC in tuff.

Selenium was not detected, but had DLs (0.52–0.64) above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in 5 of 12 tuff samples. Selenium is identified as a COPC in tuff.

Silver was detected above the BV (1 mg/kg) in 3 of 12 tuff samples, with a maximum concentration of 10.9 mg/kg. Two of the three results also exceeded the maximum background concentration of silver in tuff (1.9 mg/kg). Statistical tests were performed to determine if the site sample results for silver are different than background. The statistical test results are presented in Table F-3.1-1. The result of the

quantile test indicates that the site sample results are not statistically different than background, while the result of the slippage test indicates that the site sample results are statistically different than background. The box plot for silver in tuff is presented in Figure F-3.1-8. Silver is identified as a COPC in tuff.

F-3.1.1.3 Inorganic Chemicals in Sediment

Four sediment samples were collected at SWMU 01-001(a) and analyzed for TAL metals, nitrate, cyanide (total), and perchlorate.

Barium was detected above the BV (127 mg/kg) and above the maximum background concentration of barium in sediment (also 127 mg/kg) in three of four sediment samples, with a maximum concentration of 181 mg/kg. The box plot for barium in sediment is presented in Figure F-3.1-9. Barium is identified as a COPC in sediment.

Cobalt was detected above the BV (4.73 mg/kg) and above the maximum background concentration of cobalt in sediment (4.2 mg/kg) in one of four sediment samples, at a concentration of 5.4 mg/kg. The box plot for cobalt in sediment is presented in Figure F-3.1-10. Cobalt is identified as a COPC in sediment.

Nitrate was detected in three of four sediment samples and has no BV. Nitrate is identified as a COPC in sediment.

Selenium was not detected, but had DLs (all 0.59 mg/kg) above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in sediment (0.1 mg/kg) in three of four sediment samples. Selenium is identified as a COPC in sediment.

Vanadium was detected above the BV (19.7 mg/kg) and above the maximum background concentration of vanadium in sediment (20 mg/kg) in two of four sediment samples, with concentrations of 22 and 21.6 mg/kg. The box plot for vanadium in sediment is presented in Figure F-3.1-11. Vanadium is identified as a COPC in sediment.

F-3.1.2 Organic Chemicals at SWMU 01-001(a)

Seventeen samples were collected at SWMU 01-001(a) and analyzed for SVOCs, VOCs, and PCBs. Table 6.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.3-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.3-3.

F-3.1.2.1 Organic Chemicals in Soil

One fill sample from SWMU 01-001(a) was analyzed for SVOCs, VOCs, and PCBs.

Bis(2-ethylhexyl)phthalate and chrysene were detected in the single fill sample and are identified as COPCs in soil and fill.

F-3.1.2.2 Organic Chemicals in Tuff

Twelve tuff samples were collected at SWMU 01-001(a) and analyzed for SVOCs, VOCs, and PCBs.

Acenaphthene, acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, di-n-octylphthalate, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, methylene chloride, phenanthrene, and pyrene were detected in one or more tuff samples and are identified as COPCs in tuff.

F-3.1.2.3 Organic Chemicals in Sediment

Four sediment samples were collected at SWMU 01-001(a) and analyzed for SVOCs, VOCs, and PCBs.

Aroclor-1254, Aroclor-1260, bis(2-ethylhexyl)phthalate, and methylene chloride were detected in one or more sediment samples and are identified as COPCs in sediment.

F-3.1.3 Radionuclides at SWMU 01-001(a)

Seventeen fill, tuff, and sediment samples were collected at SWMU 01-001(a) and analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium. Table 6.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.3-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 6.3-4.

F-3.1.3.1 Radionuclides in Soil

One fill sample was collected and analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium.

No radionuclides were detected or detected above BVs/FVs, and no radionuclide COPCs are identified in soil.

F-3.1.3.2 Radionuclides in Tuff

Twelve tuff samples were collected and analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium.

Plutonium-239/240 was detected in 1 of 12 tuff samples with a concentration of 0.164 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

F-3.1.3.3 Radionuclides in Sediment

Four sediment samples were collected and analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium.

No radionuclides were detected or detected above BVs/FVs in any of the sediment samples. Therefore, no radionuclide COPCs are identified in sediment.

F-3.1.4 Summary of COPCs at SWMU 01-001(a)

The inorganic COPCs identified at SWMU 01-001(a) are barium, cadmium, chromium, cobalt, copper, total cyanide, lead, nickel, nitrate, perchlorate, selenium, silver, and vanadium.

The organic COPCs identified at SWMU 01-001(a) are acenaphthene, acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, di-n-octylphthalate, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, methylene chloride, phenanthrene, and pyrene.

The radionuclide identified as a COPC at SWMU 01-001(a) is plutonium-239/240.

F-3.1.5 Nature and Extent of Contamination at SWMU 01-001(a)

F-3.1.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 01-001(a) are barium, cadmium, chromium, cobalt, copper, total cyanide, lead, nickel, nitrate, perchlorate, selenium, silver, and vanadium. Sample results are presented in Table 6.3-2 and shown on Figure 6.3-2.

Concentrations of barium, cobalt, and vanadium decrease with depth. Therefore, the vertical extent of these COPCs is defined. Barium and vanadium were detected above BVs at downslope locations 00-603752 and 00-603754, and cobalt was detected above BVs at downslope location 00-603753. Therefore, the lateral extent of barium, cobalt, and vanadium is not defined.

Cadmium was detected (4.9 and 2.2 mg/kg) above its BV in the deepest samples at locations 00-603752 and 00-603753. There were no samples collected downslope of these locations. Therefore, the lateral and extent of cadmium is not defined. Cadmium was not detected above the BV in samples from greater depths at location 00-603751 (the former septic tank location), approximately 20 ft upslope. Therefore, the vertical extent of cadmium is defined.

Concentrations of chromium and nickel either increase with depth or remain essentially the same at seven of the eight locations sampled. The vertical extent of chromium and nickel is not defined.

Concentrations of copper increase with depth at locations 00-603752, 00-603753, and 00-603761 and increase downslope from location 00-603751. Therefore, the lateral and vertical extent of copper are not defined.

Cyanide and selenium were not detected above BVs at the site. Therefore, the lateral and vertical extent of cyanide and selenium are defined.

Concentrations of lead decrease with depth at locations 00-603748 and 00-603761, and increase with depth at location 00-603749. However, concentrations are only slightly above the maximum tuff background concentration (15.5 mg/kg). Lead was not detected above BVs at downslope locations. Therefore, the lateral and vertical extent of lead are defined.

Nitrate was detected in 10 samples at concentrations all less than 1 mg/kg. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent for nitrate are defined.

Perchlorate was detected at only one location with concentrations decreased with depth. Perchlorate was not detected at downslope locations 00-603752, 00-603753, and 00-603754. Therefore, the lateral and vertical extent for perchlorate are defined.

Concentrations of silver increase with depth at downslope locations 00-603752, 00-603753, and 00-603754. Therefore, the lateral and vertical extent of silver are not defined.

F-3.1.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 01-001(a) are acenaphthene, acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, di-n-octylphthalate, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, methylene chloride, phenanthrene, and pyrene. Sample results are presented in Table 6.3-3 and are shown in Figure 6.3-3.

The majority of detected concentrations are near or below the EQLs. Concentrations of most COPCs decrease or remain essentially the same with depth. All the concentrations of COPCs at downslope locations 00-603752, 00-603753, and 00-603754 are near EQLs, except for bis(2-ethylhexyl)phthalate, which was detected at 2 mg/kg in the deepest sample at location 00-603752. Therefore, the lateral and vertical extent of organic COPCs are defined, except for bis(2-ethylhexyl)phthalate at location 00-603752.

F-3.1.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPC identified at SWMU 01-001(a) is plutonium-239/240. Sample results are presented in Table 6.3-4 and are shown in Figure 6.3-4.

Plutonium-239/240 was detected at 0.164 pCi/g in the deepest sample collected at the site at location 00-603751. Because it is the only detected concentration throughout the site (detected in only 1 of 17 samples), the lateral and vertical extent of radionuclides are defined at SWMU 01-001(a).

F-3.1.5.4 Summary of Nature and Extent at SWMU 01-001(a)

The lateral and vertical extent of contamination are defined for all inorganic, organic, and radionuclide COPCs at SWMU 01-001(a), except for the lateral extent of barium, cadmium, cobalt, and vanadium, the vertical extent of chromium and nickel, the lateral and vertical extent of copper and silver, and the lateral and vertical extent of bis(2-ethylhexyl)phthalate.

F-3.2 SWMU 01-001(b)

A total of 23 samples (16 tuff and 7 sediment) were collected during the 2008–2009 investigation from 10 locations at SWMU 01-001(b). Table 6.4-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.4-1 is the site map showing sampling locations.

F-3.2.1 Inorganic Chemicals at SWMU 01-001(b)

All 23 samples from SWMU 01-001(b) were analyzed for anions (nitrate), TAL metals, cyanide (total), and perchlorate. Table 6.4-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.4-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.4-2.

F-3.2.1.1 Inorganic Chemicals in Tuff

Sixteen tuff samples were collected at SWMU 01-001(b) and analyzed for nitrate, TAL metals, cyanide (total), and perchlorate.

Antimony was not detected, but had a DL (0.56 mg/kg) above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in 1 of 16 tuff samples. The DL is less than 20% above the tuff BV. Because antimony only has a DL that is slightly and infrequently above background (1 of 16 samples), it is not identified as a COPC in tuff.

Cadmium was detected above the BV (1.63 mg/kg) and above the maximum background concentration of cadmium in tuff (1.5 mg/kg) in 3 of 16 tuff samples, with a maximum concentration of 8.1 mg/kg. Statistical tests were performed to determine if the site sample results for cadmium are different than background. The statistical test results are presented in Table F-3.2-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for cadmium in tuff is presented in Figure F-3.2-1. Cadmium is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 6 of 16 tuff samples, with a maximum concentration of 67.9 mg/kg. Five of the six sample results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). Statistical tests were performed to determine if the site sample results for chromium are different than background. The statistical test results are presented in Table F-3.2-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for chromium in tuff is presented in Figure F-3.2-2. Chromium is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) and above the maximum background concentration of copper in tuff (6.2 mg/kg) in 5 of 16 tuff samples, with a maximum concentration of 51.3 mg/kg. Statistical tests were performed to determine if the site sample results for copper are different than background. The statistical test results are presented in Table F-3.2-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for copper in tuff is presented in Figure F-3.2-3. Copper is identified as a COPC in tuff.

Total cyanide was not detected, but had DLs (0.54 and 0.56 mg/kg) above the BV (0.5 mg/kg) in 2 of 16 tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Both DLs are less than 20% above the tuff BV. Because total cyanide only has DLs that are slightly and infrequently above background (2 of 16 samples), it is not identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in 8 of 14 tuff samples, with a maximum concentration of 33.1 mg/kg. Six of the eight sample result also exceeded the maximum background concentration of nickel in tuff (7 mg/kg). Statistical tests were performed to determine if the site sample results for nickel are different than background. The statistical test results are presented in Table F-3.2-1. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for nickel in tuff is presented in Figure F-3.2-4. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in at least one tuff sample and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was detected above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in 1 of 16 tuff samples, at a concentration of 0.35 mg/kg. Selenium also had DLs (0.51–0.58 mg/kg) above the BV in four tuff samples. Statistical tests were not performed because the background dataset of selenium in Qbt 2,3,4 tuff are all nondetects. The box plot for selenium in tuff is presented in Figure F-3.2-5. Selenium is identified as a COPC in tuff.

Silver was detected above the BV (1 mg/kg) and above the maximum background concentration of silver in tuff (1.9 mg/kg) in 4 of 16 tuff samples, with a maximum concentration of 17.9 mg/kg. Statistical tests were performed to determine if the site sample results for silver are different than background. The statistical test results are presented in Table F-3.2-1. The result of the quantile test indicates that the site sample results are not statistically different than background, while the result of the slippage test indicates that the site sample results are statistically different than background. The box plot for silver in tuff is presented in Figure F-3.2-6. Silver is identified as a COPC in tuff.

F-3.2.1.2 Inorganic Chemicals in Sediment

Seven sediment samples were collected at SWMU 01-001(b) and analyzed for nitrate, TAL metals, cyanide (total), and perchlorate.

Chromium was detected above the BV (10.5 mg/kg) and above the maximum background concentration of chromium in sediment (9.2 mg/kg) in one of seven sediment samples, at a concentration of 20.7 mg/kg. The box plot for chromium in sediment is presented in Figure F-3.2-7. Chromium is identified as a COPC in sediment.

Lead was detected above the BV (19.7 mg/kg) in one of seven sediment samples, at a concentration of 23.1 mg/kg. The sample concentration is below the maximum background concentration of lead in sediment (25.6 mg/kg). The box plot for lead in sediment is presented in Figure F-3.2-8. Lead is not identified as a COPC in sediment.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in sediment (0.03 mg/kg) in one of seven sediment samples, at a concentration of 0.215 mg/kg. The box plot for mercury in sediment is presented in Figure F-3.2-9. Mercury is identified as a COPC in sediment.

Nickel was detected above the BV (9.38 mg/kg) and above the maximum background concentration of nickel in sediment (8.9 mg/kg) in one of seven sediment samples, at a concentration of 13.9 mg/kg. The box plot for nickel in sediment is presented in Figure F-3.2-10. Nickel is identified as a COPC in sediment.

Nitrate was detected in six of seven sediment samples and has no BV. Nitrate is identified as a COPC in sediment.

Selenium was not detected above the BV (0.3 mg/kg), but had DLs (both 0.51 mg/kg) above the BV and above the maximum background concentration of selenium in sediment (0.1 mg/kg) in two of seven sediment samples. Selenium is identified as a COPC in sediment.

F-3.2.2 Organic Chemicals at SWMU 01-001(b)

All 23 samples from SWMU 01-001(b) were analyzed for PCBs, SVOCs, and VOCs. Table 6.4-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.4-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.4-3.

F-3.2.2.1 Organic Chemicals in Tuff

Sixteen tuff samples were collected at SWMU 01-001(b) and analyzed for PCBs, SVOCs, and VOCs.

Acetone, Aroclor-1254, bis(2-ethylhexyl)phthalate, bromomethane, 4-isopropyltoluene, and methylene chloride were detected in one or more tuff samples and are identified as COPCs in tuff.

F-3.2.2.2 Organic Chemicals in Sediment

Seven sediment samples were collected at SWMU 01-001(b) and analyzed for PCBs, SVOCs, and VOCs.

Acetone, Aroclor-1254, and methylene chloride were detected in one or more sediment sample and are identified as COPCs in sediment.

F-3.2.3 Radionuclides at SWMU 01-001(b)

All 23 samples collected at SWMU 01-001(b) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.4-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.4-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 6.4-4.

F-3.2.3.1 Radionuclides in Tuff

Sixteen tuff samples from SWMU 01-001(b) and analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Cesium-134 was detected in 1 of 16 tuff samples at a concentration of 0.054 pCi/g, and has no tuff FV. Cesium-134 is identified as a COPC in tuff.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in 1 of 16 tuff samples, at a concentration of 0.14 pCi/g. Results were compared only to the BV because background dataset for uranium-235/236 in tuff is not available. Uranium-235/236 is identified as a COPC in tuff.

F-3.2.3.2 Radionuclides in Sediment

Seven sediment samples from SWMU 01-001(b) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-238 was detected above the FV (0.006 pCi/g) and above the maximum background concentration of plutonium-238 in sediment (also 0.006 pCi/g) in one of seven sediment samples, at a concentration of 0.129 pCi/g. The box plot for plutonium-238 in sediment is presented in Figure F-3.2-11. Plutonium-238 is identified as a COPC in sediment.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) and above the maximum background concentration of plutonium-239/240 in sediment (0.065 pCi/g) in one of seven sediment samples, at a concentration of 0.198 pCi/g. The box plot for plutonium-239/240 in sediment is presented in Figure F-3.2-12. Plutonium-239/240 is identified as a COPC in sediment.

Uranium-234 was detected above the BV (2.59 pCi/g) and above the maximum background concentration of uranium-234 in sediment (2.5 pCi/g) in one of seven sediment samples, at a concentration of 2.96 pCi/g. The sample result is less than 20% above the sediment BV. The box plot for uranium-234 in sediment is presented in Figure F-3.2-13. Because uranium-234 is detected slightly and infrequently above background (one of seven samples), it is not identified as a COPC in sediment.

F-3.2.4 Summary of COPCs at SWMU 01-001(b)

The inorganic chemicals identified as COPCs at SWMU 01-001(b) are cadmium, chromium, copper, mercury, nickel, nitrate, perchlorate, selenium, and silver.

The organic chemicals identified as COPCs at SWMU 01-001(b) are acetone, Aroclor-1254, bis(2-ethylhexyl)phthalate, bromomethane, 4-isopropyltoluene, and methylene chloride.

The radionuclides identified as COPCs at SWMU 01-001(b) are cesium-134, plutonium-238, plutonium-239/240, and uranium-235/236.

F-3.2.5 Nature and Extent of Contamination at SWMU 01-001(b)

F-3.2.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 01-001(b) are cadmium, chromium, copper, mercury, nickel, nitrate, perchlorate, selenium, and silver. Sample results are presented in Table 6.4-2 and Figure 6.4-2.

Concentrations of cadmium, copper, and silver decrease with depth and decrease to below BVs downslope from the outfall location. Therefore, the lateral and vertical extent of these COPCs is defined.

Concentrations of chromium and nickel increase with depth at locations 00-603764 and 00-603765, and concentrations of chromium also increase with depth at location 00-603767. Most concentrations are close to twice the BVs. The detection of nickel and chromium in these samples appear to be the result of wear and tear on the stainless-steel hand auger (discussed in section 12.1.3 of the investigation report). They were not detected above the BVs at the three most downslope locations 00-603769, 00-603770, and 00-603771. Therefore, the lateral and vertical extent of chromium and nickel are defined.

Mercury was detected at only one location with concentrations decreased with depth. Mercury was not detected above the BV at the three most downslope locations 00-603769, 00-603770, and 00-603771. Therefore, the lateral and vertical extent of mercury are defined.

Concentrations of nitrate increase with depth at location 00-603768. However, concentrations of nitrate at nearby location 00-603766 and downslope location 00-603771 are low and decrease with depth. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected only at one location with concentrations decreased with depth. Perchlorate was not detected in samples from downslope locations. Therefore, the lateral and vertical extent of perchlorate are defined.

Selenium was detected above the BV only at one location with concentrations decreased with depth. Selenium was not detected or detected above the BV in samples from downslope locations. Therefore, the lateral and vertical extent of selenium are defined.

No inorganic chemicals were detected at the three most downslope locations 00-603769, 00-603770, and 00-603771, except for nitrate (detected at less than 1 mg/kg at location 00-603771). Therefore, the lateral extent of all inorganic COPCs is defined at SWMU 01-001(b).

F-3.2.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 01-001(b) are acetone, Aroclor-1254, bis(2-ethylhexyl)phthalate, bromomethane, 4-isopropyltoluene, and methylene chloride. Sample results are presented in Table 6.4-3 and are shown in Figure 6.4-3.

Concentrations of acetone, Aroclor-1254, bis(2-ethylhexyl)phthalate, bromomethane, 4-isopropyltoluene all decrease with depth. Therefore, the vertical extent of these COPCs is defined.

Concentrations of methylene chloride increase with depth or remain essentially the same at locations 00-603764, 00-603766, 00-603767, and 00-603768. However, concentrations are at low levels (<0.02 mg/kg) that are near or below EQLs. Therefore, the vertical extent of methylene chloride is defined.

No organic chemicals were detected at the three most downslope locations (00-603769, 00-603770, and 00-603771), except for acetone (detected below EQLs). Therefore, the lateral extent of all organic COPCs is defined at SWMU 01-001(b).

F-3.2.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs identified at SWMU 01-001(b) are cesium-134, plutonium-238, plutonium-239/240, uranium-234, and uranium-235/236. Sample results are presented in Table 6.4-4 and are shown in Figure 6.4-4.

Cesium-134, plutonium-238, and plutonium-239/240 were detected above FVs only once throughout the site. Uranium-235/236 was detected once at a concentration slightly above the BV. Therefore, the lateral and vertical extent of radionuclide COPCs are defined at SWMU 01-001(b).

F-3.2.5.4 Summary of Nature and Extent at SWMU 01-001(b)

The lateral and vertical extent of contamination are defined for all inorganic, organic, and radionuclide COPCs at SWMU 01-001(b).

F-3.3 SWMU 01-001(c)

A total of 11 samples (8 tuff and 3 sediment) were collected during the 2008–2009 investigation from five locations at SWMU 01-001(c). Table 6.5-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.5-1 is the site map showing sampling locations.

F-3.3.1 Inorganic Chemicals at SWMU 01-001(c)

All 11 samples from SWMU 01-001(c) were analyzed for nitrate, perchlorate, TAL metals, and cyanide (total). Table 6.5-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.5-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BV. The sampling locations and detected concentrations are shown in Figure 6.5-2.

F-3.3.1.1 Inorganic Chemicals in Tuff

Eight tuff samples from SWMU 01-001(c) were analyzed for nitrate, perchlorate, TAL metals, and cyanide.

Aluminum was detected above the BV (7340 mg/kg) and above the maximum background concentration in tuff (8370 mg/kg) in two of eight tuff samples, with concentrations of 23600 and 19700 mg/kg. The box plot for aluminum in tuff is presented in Figure F-3.3-1. Aluminum is identified as a COPC in tuff.

Antimony was not detected above the BV (0.5 mg/kg), but had DLs (0.51–0.72 mg/kg) above the BV and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in three of eight tuff samples. Antimony is identified as a COPC in tuff.

Arsenic was detected above the BV (2.79 mg/kg) and above the maximum background concentration of arsenic in tuff (5 mg/kg) in two of eight tuff samples, with concentrations of 7.8 and 6.2 mg/kg. The box plot for arsenic in tuff is presented in Figure F-3.3-2. Arsenic is identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) and above the maximum background concentration of barium in tuff (51.6 mg/kg) in two of eight tuff samples, with concentrations of 124 and 69.9 mg/kg. The box plot for barium in tuff is presented in Figure F-3.3-3. Barium is identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) and above the maximum tuff background concentration (1.8 mg/kg) in two of eight tuff samples, with both concentrations being 2.8 mg/kg. The box plot for beryllium in tuff is presented in Figure F-3.3-4. Beryllium is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum tuff background concentration (2230 mg/kg) in two of eight tuff samples, with concentrations of 5790 and 4750 mg/kg. The box plot for calcium in tuff is presented in Figure F-3.3-5. Calcium is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in three of eight tuff samples, with a maximum concentration of 16.7 mg/kg. One of the three results also exceeded the maximum tuff background concentration of chromium in tuff (13 mg/kg). The box plot for chromium in tuff is presented in Figure F-3.3-6. Chromium is identified as a COPC in tuff.

Cobalt was detected above the BV (3.14 mg/kg) and above the maximum background concentration of cobalt in tuff (also 3.14 mg/kg) in two of eight tuff samples, with concentrations of 3.3 and 3.4 mg/kg. The box plot for cobalt in tuff is presented in Figure F-3.3-7. Cobalt is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in four of eight tuff samples, with a maximum concentration of 22.5 mg/kg. Two of the four results also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). The box plot for copper in tuff is presented in Figure F-3.3-8. Copper is identified as a COPC in tuff.

Total cyanide (total) was not detected above the BV (0.5 mg/kg), but had DLs (0.51–0.63 mg/kg) above the BV in three of eight tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Iron was detected above the BV (14,500 mg/kg) in one of eight tuff samples, at a concentration of 19,100 mg/kg. The sample concentration did not exceed the maximum background concentrations of iron in tuff (19,500 mg/kg). The box plot for iron in tuff is presented in Figure F-3.3-9. Iron is not identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) and above the maximum background concentration of lead in tuff (15.5 mg/kg) in two of eight tuff samples, with concentrations of 33.2 and 24.8 mg/kg. The box plot for lead in tuff is presented in Figure F-3.3-10. Lead is identified as a COPC in tuff.

Magnesium was detected above the BV (1690 mg/kg) and above the maximum background concentration of magnesium in tuff (2820 mg/kg) in two of eight tuff samples, with concentrations of 5520 and 4500 mg/kg. The box plot for magnesium in tuff is presented in Figure F-3.3-11. Magnesium is identified as a COPC in tuff.

Manganese was detected above the BV (482 mg/kg) in one of eight tuff samples, at a concentration of 556 mg/kg. The sample result did not exceed the maximum background concentration of manganese in tuff (752 mg/kg). The box plot for manganese in tuff is presented in Figure F-3.3-12. Manganese is not identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in two of eight tuff samples, with concentrations of 21.7 and 15.8 mg/kg. The box plot for nickel in tuff is presented in Figure F-3.3-13. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in at least one tuff sample and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was detected above the BV (0.3 mg/kg) in four of eight tuff samples, with a maximum concentration of 0.65 mg/kg. Selenium also had DLs (0.5–1.7 mg/kg) above the BV in three tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). The box plot for selenium in tuff is presented in Figure F-3.3-14. Selenium is identified as a COPC in tuff.

Thallium was detected above the BV (1.1 mg/kg) and above the maximum background concentration for thallium in tuff (1.7 mg/kg) in one of eight tuff samples, at a concentration of 2 mg/kg. Thallium also had a DL (1.5 mg/kg) above the BV in one tuff sample. The box plot for thallium in tuff is presented in Figure F-3.3-15. Thallium is identified as a COPC in tuff.

Vanadium was detected above the BV (17.0 mg/kg) and above the maximum background concentration (21 mg/kg) in two of eight tuff samples, with concentrations of 29.3 and 23.7 mg/kg. The box plot for vanadium in tuff is presented in Figure F-3.3-16. Vanadium is identified as a COPC in tuff.

F-3.3.1.2 Inorganic Chemicals in Sediment

Three sediment samples from SWMU 01-001(c) were analyzed for nitrate, perchlorate, TAL metals, and cyanide (total).

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in sediment (0.03 mg/kg) in one of three sediment samples, at a concentration of 0.342 mg/kg. The box plot for mercury in sediment is presented in Figure F-3.3-17. Mercury is identified as a COPC in sediment.

Nitrate was detected in one sediment sample and has no BV. Nitrate is identified as a COPC in sediment.

Selenium was not detected above the BV (0.3 mg/kg), but had a DL (0.52 mg/kg) above the BV and above the maximum background concentration of selenium in sediment (0.1 mg/kg) in one of three sediment samples. Selenium is identified as a COPC in sediment.

F-3.3.2 Organic Chemicals at SWMU 01-001(c)

All 11 samples from SWMU 01-001(c) were analyzed for PCBs, SVOCs, and VOCs. Table 6.5-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.5-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.5-3.

F-3.3.2.1 Organic Chemicals in Tuff

Eight tuff samples were collected at SWMU 01-001(c) and analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1260, benzyl alcohol, tert-butylbenzene, isopropylbenzene, and 1,2,4-trimethylbenzene were each detected in one tuff sample and are identified as COPCs in tuff.

F-3.3.2.2 Organic Chemicals in Sediment

Three sediment samples from SWMU 01-001(c) were analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1260 and di-n-butylphthalate were each detected in one sediment sample and are identified as COPCs in sediment.

F-3.3.3 Radionuclides at SWMU 01-001(c)

All 11 samples from SWMU 01-001(c) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.5-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.5-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 6.5-4.

F-3.3.3.1 Radionuclides in Tuff

Eight tuff samples from SWMU 01-001(c) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected in four of eight tuff samples with a maximum concentration of 1.73 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

Tritium was detected in one of eight tuff samples at a concentration of 2.07 pCi/g, and has no tuff FV. Tritium is identified as a COPC in tuff.

F-3.3.3.2 Radionuclides in Sediment

Three sediment samples from SWMU 01-001(c) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) and above the maximum background concentration of plutonium-239/240 in sediment (0.065 pCi/g) in all three sediment samples, with a maximum concentration of 7.24 pCi/g. Plutonium-239/240 is interpreted as being substantially above background and no further evaluation is necessary. Plutonium-239/240 is identified as a COPC in sediment.

F-3.3.4 Summary of COPCs at SWMU 01-001(c)

The inorganic chemicals identified as COPCs at SWMU 01-001(c) are aluminum, antimony, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, total cyanide, lead, magnesium, mercury, nickel, nitrate, perchlorate, selenium, thallium, and vanadium.

The organic chemicals identified as COPCs at SWMU 01-001(c) are Aroclor-1260, benzyl alcohol, tert-butylbenzene, di-n-butylphthalate, isopropylbenzene, and 1,2,4-trimethylbenzene.

The radionuclides identified as COPCs at SWMU 01-001(c) are plutonium-239/240 and tritium.

F-3.3.5 Nature and Extent of Contamination at SWMU 01-001(c)

F-3.3.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 01-001(c) are aluminum, antimony, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, total cyanide, lead, magnesium, mercury, nickel, nitrate, perchlorate, selenium, thallium, and vanadium. Sample results are presented in Table 6.5-2 and are shown in Figure 6.5-2.

Concentrations of aluminum, arsenic, barium, beryllium, calcium, lead, magnesium, mercury, nickel, nitrate, thallium, and vanadium decrease with depth. They were not detected or detected above BVs at the downslope locations 00-603778, 00-603779, and 00-603780. Therefore, the lateral and vertical extent of these COPCs are defined.

Antimony and cyanide were not detected at the site. The lateral and vertical extent of antimony and cyanide are defined.

Concentrations of chromium decrease with depth at location 00-603775 but increase with depth at location 00-603777. However, chromium was detected at 9.6 mg/kg, only slightly above the BV of 7.14 mg/kg, at location 00-603777. Chromium was not detected above BVs at the downslope locations 00-603778, 00-603779, and 00-603780. Therefore, the lateral and vertical extent of chromium are defined.

Concentrations of cobalt remain essentially the same with depth at concentrations less than 10% above the BV. It was not detected above the BV at the downslope locations 00-603778, 00-603779, and 00-603780. Therefore, the lateral and vertical extent of cobalt are defined.

The concentration of copper decreases with depth at location 00-603775. The concentrations of copper at location 00-603778 are below the maximum background concentration. Copper was not detected above its BV at downslope locations 00-603779 and 00-603780. Therefore, the lateral and vertical extent of copper are defined.

Perchlorate was detected only in the deepest sample at location 00-603778. Perchlorate was not detected in samples from similar depths at other locations. Therefore, the lateral and vertical extent for perchlorate are defined.

Concentrations of selenium decrease with depth at location 00-603777 and increase with depth at locations 00-603775 and 00-603778. However, concentrations are twice the BV or less and are near or below the estimated detection limit (EDL). Selenium was not detected above its BV at the downslope locations 00-603779 and 00-603780. Therefore, the lateral and vertical extent of selenium are defined.

F-3.3.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 01-001(c) are Aroclor-1260, benzyl alcohol, tert-butylbenzene, di-n-butylphthalate, isopropylbenzene, and 1,2,4-trimethylbenzene. Sample results are presented in Table 6.5-3 and Figure 6.5-3.

Concentrations of Aroclor-1260 decrease with depth. It was detected at 0.21 mg/kg at location 00-603775. Data from nearby locations show that Aroclor-1260 was not detected at locations 00-603783 [SWMU 01-006(c)], 00-603784 [SWMU 01-006(d)], and 00-603781 [SWMU 01-007(b)], and it was detected at 0.049 mg/kg at location 00-603782 [SWMU 01-007(b)]. Therefore, the lateral and vertical extent of Aroclor-1260 are defined.

Concentrations of tert-butylbenzene, di-n-butylphthalate, and isopropylbenzene decrease with depth. All detected concentrations for tert-butylbenzene, di-n-butylphthalate, and isopropylbenzene are near EQLs. Therefore, the lateral and vertical extent of these COPCs are defined.

Benzyl alcohol and 1,2,4-trimethylbenzene were detected only in the deepest samples at locations 00-603775 and 00-603778, respectively. However, they were detected at concentrations below EQLs. Therefore, the lateral and vertical extent of benzyl alcohol and 1,2,4-trimethylbenzene are defined.

F-3.3.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs identified at SWMU 01-001(c) are plutonium-239/240 and tritium. Sample results are presented in Table 6.5-4 and Figure 6.5-4.

Concentrations of plutonium-239/240 decrease with depth. It was either not detected or was detected at lower concentrations at nearby locations 00-603783 [SWMU 01-006(c)], 00-603784 [SWMU 01-006(d)], and 00-603781 and 00-603782 [SWMU 01-007(b)]. Therefore, the lateral and vertical extent of plutonium-239/240 are defined.

Tritium was detected only once (2.07 pCi/g at location 00-603775). Tritium was not detected in any downslope samples. The lateral and vertical extent of tritium are defined.

F-3.3.5.4 Summary of Nature and Extent at SWMU 01-001(c)

The lateral and vertical extent of contamination are defined for all inorganic, organic, and radionuclide COPCs at SWMU 01-001(c).

F-3.4 SWMU 01-001(d)

A total of 48 samples (5 soil and fill, 27 tuff, and 16 sediment) were collected during the 2008–2009 investigation from 23 locations at SWMU 01-001(d). Table 6.6-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.6-1 is the site map showing sampling locations.

F-3.4.1 Inorganic Chemicals at SWMU 01-001(d)

All 48 samples from SWMU 01-001(d) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.6-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.6-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown on Plate 6.6-1.

F-3.4.1.1 Inorganic Chemicals in Soil

Five soil and fill samples from SWMU 01-001(d) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Cadmium was detected above the BV (0.4 mg/kg) in one of five soil and fill samples, at a concentration of 0.7 mg/kg. The sample result did not exceed the maximum background concentration of cadmium in soil (2.6 mg/kg). The box plot for cadmium in soil is presented in Figure F-3.4-1. Cadmium is not identified as a COPC in soil.

Chromium was detected above the BV (19.3 mg/kg) and above the maximum background concentration of chromium in soil (36.5 mg/kg) in one of five soil and fill samples, at a concentration of 36.8 mg/kg. The box plot for chromium in soil is presented in Figure F-3.4-2. Chromium is identified as a COPC in soil.

Copper was detected above the BV (14.7 mg/kg) and above the maximum background concentration of copper in soil (16 mg/kg) in two of five soil and fill samples, with concentrations of 17.9 and 42.1 mg/kg. The box plot for copper in soil is presented in Figure F-3.4-3. Copper is identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) in three of five soil and fill samples, with a maximum concentration of 44.9 mg/kg. Two of the three sample results also exceeded the maximum background concentration of lead in soil (28 mg/kg). The box plot for lead in soil is presented in Figure F-3.4-4. Lead is identified as a COPC in soil.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in soil (also 0.1 mg/kg) in three of five soil and fill samples, with a maximum concentration of 1.5 mg/kg. The box plot for mercury in soil is presented in Figure F-3.4-5. Mercury is identified as a COPC in soil.

Nitrate was detected in two of five soil and fill samples and has no BV. Nitrate is identified as a COPC in soil.

Silver was detected above the BV (1 mg/kg) in two of five soil and fill samples, with concentrations of 8 and 1.2 mg/kg. Results were compared only to the BV because a background dataset for silver in soil is not available. Silver is identified as a COPC in soil.

Zinc was detected above the BV (48.8 mg/kg) in one of five soil and fill samples, at a concentration of 59.8 mg/kg. The sample results did not exceed the maximum background concentration of zinc in soil

(75.5 mg/kg). The box plot for zinc in soil is presented in Figure F-3.4-6. Zinc is not identified as a COPC in soil.

F-3.4.1.2 Inorganic Chemicals in Tuff

Twenty-seven tuff (17 Qbt 3 and 10 Qbt 1g) samples from SWMU 01-001(d) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Aluminum was detected above the BV (3560 mg/kg) and above the maximum background concentration of aluminum in Qbt 1g tuff (3400 mg/kg) in 1 of 10 Qbt 1g tuff samples, at a concentration of 7210 mg/kg. Statistical tests were performed to determine if the site sample results from Qbt 1g for aluminum are different than background. The statistical test results are presented in Table F-3.4-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for aluminum in Qbt 1g tuff is presented in Figure F-3.4-7. Aluminum is identified as a COPC in tuff.

Antimony was detected above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in Qbt 3 tuff (0.4 mg/kg) in 1 of 17 Qbt 3 tuff samples, at a concentration of 1.4 mg/kg. Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetected values. The box plot for antimony in Qbt 3 tuff is presented in Figure F-3.4-8. Antimony is identified as a COPC in tuff.

Arsenic was detected above the respective BV (2.79 mg/kg for Qbt 3 and 0.56 mg/kg for Qbt 1g) in 1 of 17 Qbt 3 and all 10 Qbt 1g tuff samples, with a maximum concentration of 3.3 mg/kg. The result (3.3 mg/kg) from Qbt 3 tuff did not exceeded the maximum background concentration of arsenic in Qbt 3 tuff (5 mg/kg). Six of the 10 results from Qbt 1g tuff exceeded the maximum background concentration of arsenic in Qbt 1g tuff (0.7 mg/kg). Statistical tests were performed to determine if the site sample results from Qbt 3 and Qbt 1g for arsenic are different than background. The statistical test results are presented in Table F-3.4-1. For arsenic in Qbt 3 tuff, the result of the Gehan test indicates that the site sample results are not statistically different than background, while the result of the quantile test indicates that the site sample results are statistically different than background. For arsenic in Qbt 1g tuff, the result of the Gehan test indicates that the site sample results are statistically different than background. The box plots for arsenic in Qbt 3 and Qbt 1g tuff are presented in Figures F-3.4-9 and F-3.4-10, respectively. Arsenic is identified as a COPC in tuff.

Barium was detected above the respective BV (46.0 mg/kg for Qbt 3 and 25.7 mg/kg for Qbt 1g) in 1 of 17 Qbt 3 and 2 of 10 Qbt 1g tuff samples, with a maximum concentration of 74.1 mg/kg. All sample results also exceeded the respective maximum background concentration of barium in tuff (51.6 mg/kg for Qbt 3 and 23 mg/kg for Qbt 1g). Statistical tests were performed to determine if the site sample results from Qbt 3 and Qbt 1g for barium are different than background. The statistical test results are presented in Table F-3.4-1. For barium in Qbt 3 tuff, the results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. For barium in Qbt 1g tuff, the result of the Gehan test indicates that the site sample results are not statistically different than background, while the result of the quantile test indicates that the site sample results are statistically different than background. The box plots for barium in Qbt 3 and Qbt 1g tuff are presented in Figures F-3.4-11 and F-3.4-12, respectively. Barium is identified as a COPC in tuff.

Beryllium was detected above the respective BV (1.21 mg/kg for Qbt 3 and 1.44 mg/kg for Qbt 1g) in 1 of 17 Qbt 3 and 2 of 10 Qbt 1g tuff samples, with a maximum concentration of 1.9 mg/kg. All sample results also exceeded the respective maximum background concentration of beryllium in tuff (1.8 mg/kg for Qbt 3 and 1.4 mg/kg for Qbt 1g). Statistical tests were performed to determine if the site sample results from Qbt 3 and Qbt 1g for beryllium are different than background. The statistical test results are presented in

Table F-3.4-1. For beryllium in Qbt 3 tuff, the results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. For beryllium in Qbt 1g tuff, the result of the Gehan test indicates that the site sample results are statistically different than background. The box plots for beryllium in Qbt 3 and Qbt 1g tuff are presented in Figures F-3.4-13 and F-3.4-14, respectively. Beryllium is identified as a COPC in tuff.

Chromium was detected above the respective BV (7.14 mg/kg for Qbt 3 and 2.6 mg/kg for Qbt 1g) in 11 of 17 Qbt 3 and 9 of 10 Qbt 1g tuff samples, with a maximum concentration of 69.4 mg/kg. Six of the 11 results from Qbt 3 and all 9 results from Qbt 1g also exceeded the respective maximum background concentration of chromium in tuff (13 mg/kg for Qbt 3 and 2.3 mg/kg for Qbt 1g). Statistical tests were performed to determine if the site sample results from Qbt 3 and Qbt 1g for chromium are different than background. The statistical test results are presented in Table F-3.4-1. For chromium in both Qbt 3 and Qbt 1g tuff, the results of the Gehan test indicate that the site sample results are statistically different than background. The box plots for chromium in Qbt 3 and Qbt 1g tuff are presented in Figures F-3.4-15 and F-3.4-16, respectively. Chromium is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 12 of 17 Qbt 3 tuff samples, with a maximum concentration of 30 mg/kg. Seven of the 12 results also exceeded the maximum background concentration of copper in Qbt 3 tuff (6.2 mg/kg). Statistical tests were performed to determine if the site sample results from Qbt 3 for copper are different than background. The statistical test results are presented in Table F-3.4-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for copper in Qbt 3 tuff is presented in Figure F-3.4-17. Copper is identified as a COPC in tuff.

Total cyanide was not detected but had DLs (0.51 and 0.53 mg/kg) above the respective BV (both 0.5 mg/kg for Qbt 3 and Qbt 1g) in 1 of 17 Qbt 3 and 1 of 10 Qbt 1g tuff samples. The DLs are less than 20% above the respective BV. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Because total cyanide only has two DLs that are slightly and infrequently above background (2 of 27 samples), it is not identified as a COPC in tuff.

Iron was detected above the respective BV (14500 mg/kg for Qbt 3 and 3700 mg/kg for Qbt 1g) in 1 of 17 Qbt 3 and 9 of 10 Qbt 1g tuff samples, with a maximum concentration of 21600 mg/kg. All results also exceeded the respective maximum background concentration of iron in tuff (19500 mg/kg for Qbt 3 and 3700 mg/kg for Qbt 1g). Statistical tests were performed to determine if the site sample results from Qbt 3 and Qbt 1g for iron are different than background. The statistical test results are presented in Table F-3.4-1. For iron in Qbt 3 tuff, the results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. For iron in Qbt 1g tuff, the result of the Gehan test indicates that the site sample results are statistically different than background. The box plots for iron in Qbt 3 and Qbt 1g tuff are presented in Figures F-3.4-18 and F-3.4-19, respectively. Iron is identified as a COPC in tuff.

Lead was detected above the respective BV (11.2 mg/kg for Qbt 3 and 13.5 mg/kg for Qbt 1g) in 8 of 17 Qbt 3 and 2 of 10 Qbt 1g tuff samples, with a maximum concentration of 62.6 mg/kg. Three of the eight results from Qbt 3 also exceeded the maximum background concentration of lead in Qbt 3 tuff (15.5 mg/kg). The two results from Qbt 1g did not exceed the maximum background concentration of lead in Qbt 1g tuff (20 mg/kg). Statistical tests were performed to determine if the site sample results from Qbt 3 and Qbt 1g for lead are different than background. The statistical test results are presented in Table F-3.4-1. For lead in both Qbt 3 and Qbt 1g tuff, the results of the Gehan test indicate that the site sample results are statistically different than background. The box plots for lead in Qbt 3 and Qbt 1g tuff are presented in Figures F-3.4-20 and F-3.4-21, respectively. Lead is identified as a COPC in tuff.

Manganese was detected above the respective BV (482 mg/kg for Qbt 3 and 189 mg/kg for Qbt 1g) in 1 of 17 Qbt 3 and 8 of 10 Qbt 1g tuff samples, with a maximum concentration of 765 mg/kg. The result from Qbt 3 and six of the eight results from Qbt 1g also exceeded the respective maximum background concentration of manganese in tuff (752 mg/kg for Qbt 3 and 210 mg/kg for Qbt 1g). Statistical tests were performed to determine if the site sample from Qbt 3 and Qbt 1g results for manganese are different than background. The statistical test results are presented in Table F-3.4-1. For manganese in Qbt 3 tuff, the results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. For manganese in Qbt 1g tuff, the result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for manganese in Qbt 3 and Qbt 1g tuff is presented in Figures F-3.4-22 and F-3.4-23, respectively. Manganese is identified as a COPC in tuff.

Mercury was detected above the respective BV (both 0.1 mg/kg in Qbt 3 and Qbt 1g) in 11 of 17 Qbt 3 and 1 of 10 Qbt 1g tuff samples, with a maximum concentration of 155 mg/kg. Results were compared only to the BV because a background dataset for mercury in tuff is not available. Mercury is identified as a COPC in tuff.

Nickel was detected above the respective BV (6.58 mg/kg for Qbt 3 and 2 mg/kg for Qbt 1g) in 6 of 17 Qbt 3 and 9 of 10 Qbt 1g tuff samples, with a maximum concentration of 19.7 mg/kg. Four of the six results from Qbt 3 and eight of the nine results from Qbt 1g also exceeded the respective maximum background concentration of nickel in tuff (7 mg/kg for Qbt 3 and 2.8 mg/kg for Qbt 1g). Statistical tests were performed to determine if the site sample results from Qbt 3 and Qbt 1g for nickel are different than background. The statistical test results are presented in Table F-3.4-1. For nickel in both Qbt 3 and Qbt 1g tuff, the results of the quantile test indicate that the site sample results are statistically different than background. The box plots for nickel in Qbt 3 and Qbt 1g tuff are presented in Figures F-3.4-24 and F-3.4-25, respectively. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were each detected in multiple tuff samples and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was detected above the respective BV (both 0.3 mg/kg in Qbt 3 and Qbt 1g) in 3 of 17 Qbt 3 and 7 of 10 Qbt 1g tuff samples, with a maximum concentration of 0.62 mg/kg. Selenium also had DLs (0.51–0.53 mg/kg) above the respective BV in two Qbt 3 and one Qbt 1g tuff samples. Results from Qbt 3 were compared only to the BV because the BV is greater than the maximum background concentration of selenium in Qbt 3 tuff (0.105 mg/kg). Statistical tests were not performed because the background data of selenium in Qbt 2,3,4 tuff are all nondetects. A background dataset for selenium in Qbt 1g is not available. The box plot for selenium in Qbt 3 tuff is presented in Figure F-3.4-26. Selenium is identified as a COPC in tuff.

Silver was detected above the BV (1 mg/kg) in 2 of 17 Qbt 3 tuff samples, with concentrations of 4.4 and 1.9 mg/kg. One sample result also exceeded the maximum background concentration of silver in Qbt 3 tuff (1.9 mg/kg). Statistical tests were performed to determine if the site sample results from Qbt 3 for silver are different than background. The statistical test results are presented in Table F-3.4-1. The results of both the quantile test and the slippage test indicate that the site sample results are not statistically different than background. The box plot for silver in Qbt 3 tuff is presented in Figure F-3.4-27. Silver is not identified as a COPC in tuff.

Vanadium was detected above the BV (4.59 mg/kg) and above the maximum background concentration of vanadium in Qbt 1g tuff (3.8 mg/kg) in 1 of 10 Qbt 1g tuff samples, at a concentration of 4.8 mg/kg. Statistical tests were performed to determine if the site sample results from Qbt 1g for vanadium are different than background. The statistical test results are presented in Table F-3.4-1. The result of the

Gehan test indicates that the site sample results are statistically different than background. The box plot for vanadium in Qbt 1g tuff is presented in Figure F-3.4-28. Vanadium is identified as a COPC in tuff.

Zinc was detected above the respective BV (63.5 mg/kg for Qbt 3 and 40.0 mg/kg for Qbt 1g) in 2 of 17 Qbt 3 and 2 of 3 Qbt 1g tuff samples, with a maximum concentration of 168 mg/kg. Both results from Qbt 3 and one of the two results from Qbt 1g also exceeded the respective maximum background concentration of zinc in tuff (65.6 mg/kg for Qbt 3 and 46 mg/kg for Qbt 1g). Statistical tests were performed to determine if the site sample results from Qbt 3 for zinc are different than background. The statistical test results are presented in Table F-3.4-1. For zinc in Qbt 3 tuff, the results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. Statistical tests were not performed for samples results from Qbt 1g because the number of results was less than 10. Zinc is identified as a COPC in Qbt 1g tuff. The box plots for zinc in Qbt 3 and Qbt 1g tuff are presented in Figures F-3.4-29 and F-3.4-30, respectively. Zinc is identified as a COPC in tuff.

F-3.4.1.3 Inorganic Chemicals in Sediment

Sixteen sediment samples from SWMU 01-001(d) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Antimony was detected above the BV (0.83 mg/kg) in 1 of 16 sediment samples, at a concentration of 0.94 mg/kg. The sample concentration is less than 20% above the BV. Results were compared only to the BV because a background dataset for antimony in sediment is not available. Because antimony was detected slightly and infrequently above background (1 of 16 samples), it is not identified as a COPC in sediment.

Barium was detected above the BV (127 mg/kg) and above the maximum background concentration of barium in sediment (also 127 mg/kg) in 3 of 16 sediment samples, with a maximum concentration of 167 mg/kg. Statistical tests were performed to determine if the site sample results for barium are different than background. The statistical test results are presented in Table F-3.4-2. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for barium in sediment is presented in Figure F-3.4-31. Barium is not identified as a COPC in sediment.

Cadmium was detected above the BV (0.4 mg/kg) and above the maximum background concentration of cadmium in sediment (0.18 mg/kg) in 1 of 16 sediment samples, at a concentration of 0.41 mg/kg. Statistical tests were performed to determine if the site sample results for cadmium are different than background. The statistical test results are presented in Table F-3.4-2. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for cadmium in sediment is presented in Figure F-3.4-32. Therefore, cadmium is identified as a COPC in sediment.

Chromium was detected above the BV (10.5 mg/kg) and above the maximum background concentration of chromium in sediment (9.2 mg/kg) in 1 of 16 sediment samples, at a concentration of 86.4 mg/kg. Statistical tests were performed to determine if the site sample results for chromium are different than background. The statistical test results are presented in Table F-3.4-2. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for chromium in sediment is presented in Figure F-3.4-33. Chromium is not identified as a COPC in sediment.

Cobalt was detected above the BV (4.73 mg/kg) and above the maximum background concentration of cobalt in sediment (4.2 mg/kg) in 2 of 16 sediment samples, with concentrations of 4.9 and 5.2 mg/kg.

Statistical tests were performed to determine if the site sample results for cobalt are different than background. The statistical test results are presented in Table F-3.4-2. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for cobalt in sediment is presented in Figure F-3.4-34. Cobalt is not identified as a COPC in sediment.

Copper was detected above the BV (11.2 mg/kg) and above the maximum background concentration (12 mg/kg) in 3 of 14 sediment samples, with a maximum concentration of 20.4 mg/kg. Statistical tests were performed to determine if the site sample results for copper are different than background. The statistical test results are presented in Table F-3.4-2. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for copper in sediment is presented in Figure F-3.4-35. Copper is not identified as a COPC in sediment.

Lead was detected above the BV (19.7 mg/kg) in 5 of 16 sediment samples, with a maximum concentration of 114 mg/kg. Three of the five results also exceeded the maximum background concentration (25.6 mg/kg). Statistical tests were performed to determine if the site sample results for lead are different than background. The statistical test results are presented in Table F-3.4-2. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for lead in sediment is presented in Figure F-3.4-36. Lead is identified as a COPC in sediment.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in sediment (0.03 mg/kg) in 6 of 16 sediment samples, with a maximum concentration of 45.9 mg/kg. Mercury is interpreted as being substantially above background and no further evaluation is necessary. Mercury is identified as a COPC in sediment.

Nitrate and perchlorate were each detected in multiple sediment samples, and have no BVs. Nitrate and perchlorate are identified as COPCs in sediment.

Selenium was detected above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in sediment (0.1 mg/kg) in 3 of 16 sediment samples, with a maximum concentration of 0.36 mg/kg. Selenium also had DLs (0.53–0.55 mg/kg) above the BV in four sediment samples. Statistical tests were not performed because the background data of selenium in sediment are all nondetects. The box plot for selenium in sediment is presented in Figure F-3.4-37. Selenium is identified as a COPC in sediment.

Silver was detected above the BV (1 mg/kg) and above the maximum background concentration of silver in sediment (0.28 mg/kg) in 1 of 16 sediment samples, at a concentration of 3.7 mg/kg. Statistical tests were performed to determine if the site sample results for silver are different than background. The statistical test results are presented in Table F-3.4-2. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for silver in sediment is presented in Figure F-3.4-38. Silver is identified as a COPC in sediment.

Zinc was detected above the BV (60.2 mg/kg) and above the maximum background concentration of zinc in sediment (56.2 mg/kg) in 1 of 10 sediment samples, at a concentration of 89 mg/kg. Statistical tests were performed to determine if the site sample results for zinc are different than background. The statistical test results are presented in Table F-3.4-2. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for zinc in sediment is presented in Figure F-3.4-39. Zinc is not identified as a COPC in sediment.

F-3.4.2 Organic Chemicals at SWMU 01-001(d)

All 48 samples from SWMU 01-001(d) were analyzed for PCBs, SVOCs, and VOCs. Table 6.6-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.6-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 6.6-2.

F-3.4.2.1 Organic Chemicals in Soil

Five soil and fill samples from SWMU 01-001(d) were analyzed for PCBs, SVOCs, and VOCs.

Acetone, Aroclor-1254, Aroclor-1260, bis(2-ethylhexyl)phthalate, and di-n-butylphthalate were detected in one or more soil and fill samples and are identified as COPCs in soil and fill.

F-3.4.2.2 Organic Chemicals in Tuff

Twenty-seven tuff samples from SWMU 01-001(d) were analyzed for PCBs, SVOCs, and VOCs.

Acetone, Aroclor-1248, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, fluoranthene, methylene chloride, phenanthrene, pyrene, and toluene were detected in one or more tuff samples and are identified as COPCs in tuff.

F-3.4.2.3 Organic Chemicals in Sediment

Sixteen sediment samples from SWMU 01-001(d) were analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1254, Aroclor-1260, benzo(a)pyrene, benzo(g,h,i)perylene, bis(2-ethylhexyl)phthalate, chrysene, methylene chloride, and pentachlorophenol were detected in one or more sediment samples and are identified as COPCs in sediment.

F-3.4.3 Radionuclides at SWMU 01-001(d)

All 48 samples from SWMU 01-001(d) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.6-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.6-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown on Plate 6.6-3.

F-3.4.3.1 Radionuclides in Soil

Five soil and fill samples from SWMU 01-001(d) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Cesium-137 was detected in three of five soil and fill samples at depths where the FV does not apply, with a maximum concentration of 3.95 pCi/g. Cesium-137 is identified as a COPC in soil.

Plutonium-239/240 was detected in all five soil and fill samples at depths where the FV does not apply, with a maximum concentration of 189 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

Strontium-90 was detected in one of five soil and fill samples at a depth where the FV does not apply, at a concentration of 0.5 pCi/g. Strontium-90 is identified as a COPC in soil.

F-3.4.3.2 Radionuclides in Tuff

Twenty-seven tuff samples were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Americium-241 was detected in 2 of 27 tuff samples with concentrations of 1.81 and 0.129 pCi/g, and has no tuff FV. Americium-241 is identified as a COPC in tuff.

Cesium-137 was detected in 8 of 27 tuff samples with a maximum concentration of 2.87 pCi/g, and has no tuff FV. Cesium-137 is identified as a COPC in tuff.

Plutonium-239/240 was detected in 14 of 27 tuff samples with a maximum concentration of 490 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

Strontium-90 was detected in 2 of 27 tuff samples with concentrations of 0.281 and 0.278 pCi/g, and has no tuff FV. Strontium-90 is identified as a COPC in tuff.

Uranium-234 was detected above the BV (1.98 pCi/g) in 1 of 27 tuff samples, at a concentration of 2.58 pCi/g. Results were compared only to the BV because background dataset for uranium-234 in tuff is not available. Uranium-234 is identified as a COPC in tuff.

Uranium-238 was detected above the BV (1.93 pCi/g) in 1 of 27 tuff samples, at a concentration of 2.69 pCi/g. Results were compared only to the BV because background dataset for uranium-238 in tuff is not available. Uranium-238 is identified as a COPC in tuff.

F-3.4.3.3 Radionuclides in Sediment

Sixteen sediment samples were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Americium-241 was detected above the FV (0.040 pCi/g) and above the maximum background concentration of americium-241 in sediment (0.038 pCi/g) in 1 of 16 sediment samples, at a concentration of 2.53 pCi/g. Statistical tests were performed to determine if the site sample results for americium-241 are different than background. The statistical test results are presented in Table F-3.4-3. The results of both the quantile test and the slippage test indicate that the site sample results are not statistically different than background. The box plot for americium-241 in sediment is presented in Figure F-3.4-40. Americium-241 is not identified as a COPC in sediment.

Cesium-137 was detected above the FV (0.90 pCi/g) and above the maximum background concentration of cesium-137 in sediment (1.28 pCi/g) in 1 of 16 sediment samples, at a concentration of 3.02 pCi/g. Statistical tests were performed to determine if the site sample results for cesium-137 are different than background. The statistical test results are presented in Table F-3.4-3. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for cesium-137 in sediment is presented in Figure F-3.4-41. Cesium-137 is identified as a COPC in sediment.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) and above the maximum background concentration of plutonium-239/240 in sediment (0.065 pCi/g) in 11 of 16 sediment samples, with a maximum concentration of 373 pCi/g. Plutonium-239/240 is interpreted as being substantially above background and no further evaluation is necessary. Plutonium-239/240 is identified as a COPC in sediment.

Uranium-234 was detected above the BV (2.59 pCi/g) and above the maximum background concentration of uranium-234 in sediment (2.5 pCi/g) in 2 of 16 sediment samples, with concentrations of 2.68 and 3.28 pCi/g. Statistical tests were performed to determine if the site sample results for uranium-234 are different than background. The statistical test results are presented in Table F-3.4-3. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for uranium-234 in sediment is presented in Figure F-3.4-42. Uranium-234 is not identified as a COPC in sediment.

Uranium-238 was detected above the BV (2.29 pCi/g) and above maximum background concentration of uranium-238 in sediment (2.1 pCi/g) in 2 of 16 sediment samples, with concentrations of 2.4 and 2.95 pCi/g. Statistical tests were performed to determine if the site sample results for uranium-238 are different than background. The statistical test results are presented in Table F-3.4-3. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for uranium-238 in sediment is presented in Figure F-3.4-43. Uranium-238 is not identified as a COPC in sediment.

F-3.4.4 Summary of COPCs at SWMU 01-001(d)

The inorganic chemicals identified as COPCs at SWMU 01-001(d) are aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, nitrate, perchlorate, selenium, silver, vanadium, and zinc.

The organic chemicals identified as COPCs at SWMU 01-001(d) are acetone, Aroclor-1248, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, di-n-butylphthalate, fluoranthene, methylene chloride, pentachlorophenol, phenanthrene, pyrene, and toluene.

The radionuclides identified as COPCs at SWMU 01-001(d) are americium-241, cesium-137, plutonium-239/240, strontium-90, uranium-234, and uranium-238.

F-3.4.5 Nature and Extent of Contamination at SWMU 01-001(d)

F-3.4.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs at SWMU 01-001(d) are aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, nitrate, perchlorate, selenium, silver, vanadium, and zinc. Sample results for the detected inorganic COPCs identified at SWMU 01-001(d) are presented in Table 6.6-2 and are shown on Plate 6.6-1.

Aluminum, antimony, arsenic, barium, beryllium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, and zinc increase with depth and are above their BVs in the deeper sample at one or more locations. Therefore, vertical extent of these COPCs is not defined.

Cadmium was detected above the BV at two locations and concentrations decreased with depth. Cadmium was not detected above the BV at downslope locations. Therefore, the lateral and vertical extent of cadmium are defined.

Nitrate concentrations decrease with depth at most locations where it was detected and decrease with distance downslope. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected at low levels (maximum 0.035 mg/kg) and decreases with depth at three of the four locations where it was detected. The concentration of perchlorate decreases with distance downslope. Therefore, the lateral and vertical extent of perchlorate are defined.

Vanadium was detected above the BV only in the deepest sample at location 00-603819. The concentration is less than 10% above the BV. Vanadium was not detected above the BV in samples from similar depths at other locations. Therefore, the lateral and vertical extent of vanadium are defined.

The highest concentrations of most of the inorganic COPCs are in the vicinity of the former outfall (location 00-603821) or within approximately 50 to 100 ft downslope from that location. Most of the inorganic COPCs decrease with distance downslope, so their lateral extent is defined. Chromium and nickel, however, increase downslope from location 00-603816 to location 00-603819 (the location closest to the toe of the slope in Los Alamos Canyon). Therefore, the lateral extent of chromium and nickel is not defined.

F-3.4.5.2 Nature and Extent of Organic COPCs

The organic COPCs at SWMU 01-001(d) are acetone, Aroclor-1248, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, di-n-butylphthalate, fluoranthene, methylene chloride, pentachlorophenol, phenanthrene, pyrene, and toluene. Sample results for the organic COPCs identified at SWMU 01-001(d) are presented in Table 6.6-3 and are shown on Plate 6.6-2.

The concentrations of the organic COPCs decrease with depth and with distance downslope at all locations, except at locations 00-603802, 00-603800, 00-603810, 00-603812, 00-603819, and 00-603801.

At location 00-603802, Aroclor-1260 increases from 0.014 mg/kg at the surface to 0.055 mg/kg in the deepest sample. However, at the two nearest locations (00-603800 and 00-603821), the concentration of Aroclor-1260 decreases with depth and is lower in the deeper samples than at location 00-603802. Aroclor-1260 decreases with depth at all other locations and decreases with distance downslope. Therefore, the lateral and vertical extent of Aroclor-1260 are defined.

At locations 00-603800 and 00-603801, eight polycyclic aromatic hydrocarbons (PAHs) were detected in only the deepest samples. However, at two nearby locations (00-603802 and 00-603821) no PAHs were detected, including a deeper sample (4–5 ft bgs) at location 00-603821. At both locations the PAHs were detected at low concentrations near or below the EQL. PAHs also decrease to nondetection downslope of both locations. Benzo(g,h,i)perylene was detected only in the surface sample at one location. Therefore, the lateral and vertical extent of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene are defined.

At location 00-603810, acetone was detected in only the deepest sample. However, it was detected at a low concentration, and was detected in only one other sample at this site, at 00-603820 where it was

detected at a similar low concentration near the EQL, and only in the surface sample. Therefore, the lateral and vertical extent of acetone are defined.

At location 00-603812, bis(2-ethylhexyl)phthalate was detected only in the deepest sample from 1–2 ft bgs. The concentration (0.055 mg/kg) is below the EQL. The concentration represents a decrease from the other two locations (both upslope) where it was detected (locations 00-603809 and 00-603821). Therefore, the lateral and vertical and vertical extent of bis(2-ethylhexyl)phthalate are defined.

At location 00-603819, toluene was detected only in the deepest sample. The low concentration (0.00083) is below the EQL, and toluene was not detected in any other samples at this site. Therefore, the lateral and vertical extent of toluene are defined.

F-3.4.5.3 Nature and Extent of Radionuclide COPCs

The radionuclides COPCs at SWMU 01-001(d) are americium-241, cesium-137, plutonium-239/240, strontium-90, uranium-234, and uranium-238. Sample results for the radionuclide COPCs identified at SWMU 01-001(d) are presented in Table 6.6-4 and are shown on Plate 6.6-3.

The concentrations of all the radionuclide COPCs decrease with depth and with distance downslope except cesium-137 and plutonium-239/240. Americium-241, uranium-234, and uranium-238 increase with depth at location 00-603801 but were not detected in samples from similar or deeper depths at nearby locations 00-603802, 00-603800, and 00-603821. Therefore, the lateral and vertical extent of americium-241, strontium-90, uranium-234, and uranium-238 are defined.

Plutonium-239/240 increases with depth at locations 00-603801 (from 0.195 to 490 pCi/g) and 00-603802 (detected only in the deeper sample, 0.296 pCi/g). The concentration of plutonium-239/240 generally decreases laterally away and downslope from the former outfall location, but it was detected at 5.45 pCi/g in the surface sample at location 00-603803, the western-most sample location at this site. Therefore, the lateral and vertical extent of plutonium-239/240 are not defined.

Cesium-137 was detected only in the deepest samples at the two locations nearest the toe of the slope in Los Alamos Canyon. Cesium-137 also increases with depth at locations 00-603806 and 00-603801. Therefore, the lateral and vertical extent of cesium-137 are not defined.

F-3.4.5.4 Summary of Nature and Extent at SWMU 01-001(d)

The vertical extent of contamination is not defined for several inorganic COPCs. The lateral extent of contamination is not defined for chromium and nickel.

The lateral and vertical extent of contamination are defined for all organic COPCs.

The lateral and vertical extent of contamination are not defined for cesium-137 and plutonium-239/240.

F-3.5 SWMU 01-001(e)

A total of four samples (all tuff) were collected during the 2008–2009 investigation from two locations at SWMU 01-001(e). Table 6.7-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.7-1 is the site map showing sampling locations.

F-3.5.1 Inorganic Chemicals at SWMU 01-001(e)

All four samples collected at SWMU 01-001(e) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.7-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.7-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.7-2.

F-3.5.1.1 Inorganic Chemicals in Tuff

Four tuff samples from SWMU 01-001(e) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Antimony was not detected, but had DLs (0.58 and 0.56 mg/kg) above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in two of four tuff samples. Antimony is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and the maximum background concentration of calcium in tuff (2230 mg/kg) in one of four tuff samples, at a concentration of 4940 mg/kg. The box plot for calcium in tuff is presented in Figure F-3.5-1. Calcium is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in one of four tuff samples, at a concentration of 8 mg/kg. The sample result is below the maximum background concentration of chromium in tuff (13 mg/kg). The box plot for chromium in tuff is presented in Figure F-3.5-2. Chromium is not identified as a COPC in tuff.

Total cyanide was not detected, but had DLs (0.58 and 0.83 mg/kg) above the BV (0.5 mg/kg) in two of four tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Selenium was detected above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in one of four tuff samples, at a concentration of 0.31 mg/kg. The sample result is essentially the background value. The box plot for selenium in tuff is presented in Figure F-3.5-3. Selenium is not identified as a COPC in tuff.

F-3.5.2 Organic Chemicals at SWMU 01-001(e)

All four samples from SWMU 01-001(e) were analyzed for PCBs, SVOCs, and VOCs. Table 6.7-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.7-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.7-3.

F-3.5.2.1 Organic Chemicals in Tuff

Four tuff samples from SWMU 01-001(e) were analyzed for PCBs, SVOCs, and VOCs.

Toluene was detected in one tuff sample, and is identified as a COPC in tuff.

F-3.5.3 Radionuclides at SWMU 01-001(e)

Four tuff samples from SWMU 01-001(e) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.7-1 summarizes the samples collected and the requested analyses for each sample.

F-3.5.3.1 Radionuclides in Tuff

No radionuclides were detected or detected above BVs in tuff samples from SWMU 01-001(e).

F-3.5.4 Summary of COPCs at SWMU 01-001(e)

Inorganic COPCs identified at SWMU 01-001(e) are antimony, calcium, and total cyanide.

The only organic COPC at SWMU 01-001(e) is toluene.

No radionuclide COPCs are identified at SWMU 01-001(e).

F-3.5.5 Nature and Extent of Contamination at SWMU 01-001(e)

F-3.5.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPC identified at SWMU 01-001(e) are antimony, calcium, and total cyanide. Sample results are presented in Table 6.7-2 and are shown in Figure 6.7-2.

Antimony and cyanide were not detected at the site. Therefore, the lateral and vertical extent for antimony and thallium are defined.

Calcium was detected above the BV only in the deepest sample at location 00-603823. The concentration is approximately 2.2 times the BV. Calcium was not detected above the BV in samples from the other location at the site. Therefore, the lateral and vertical extent of calcium are defined.

F-3.5.5.2 Nature and Extent of Organic COPCs

The organic COPC identified at SWMU 01-001(e) is toluene. Sample results are presented in Table 6.7-3 and are shown in Figure 6.7-3.

Toluene was detected only once (0.0004 mg/kg) and its concentration decreases with depth. Therefore, the lateral and vertical extent of toluene are defined.

F-3.5.5.3 Summary of Nature and Extent at SWMU 01-001(e)

The lateral and vertical extent of inorganic and organic COPCs are defined at SWMU 01-001(e).

F-3.6 SWMU 01-001(f)

A total of 43 samples (27 tuff and 16 sediment) were collected during the 2008–2009 investigation from 21 locations at SWMU 01-001(f). Table 6.8-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.8-1 is the site map showing sampling locations.

F-3.6.1 Inorganic Chemicals at SWMU 01-001(f)

All 43 samples from SWMU 01-001(f) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.8-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.8-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.8-2.

F-3.6.1.1 Inorganic Chemicals in Tuff

All 27 tuff samples from SWMU 01-001(f) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Antimony was detected above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in 1 of 27 tuff samples, at a concentration of 0.54 mg/kg. Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetected values. The box plot for antimony in tuff is presented in Figure F-3.6-1. The sample concentration is less than 20% above the BV. Because antimony was detected slightly and infrequently above background (1 of 27 samples), it is not identified as a COPC in tuff.

Cadmium was detected above the BV (1.63 mg/kg) and above the maximum background concentration of cadmium in tuff (1.5 mg/kg) in 2 of 27 tuff samples, with concentrations of 1.9 and 5 mg/kg. Statistical tests were performed to determine if the site sample results for cadmium are different than background. The statistical test results are presented in Table F-3.6-1. The results of both the quantile test and the slippage test indicate that the site sample results are not statistically different than background. The box plot for cadmium in tuff is presented in Figure F-3.6-2. Cadmium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 18 of 27 tuff samples, with a maximum concentration of 74.2 mg/kg. Ten of the 18 results also exceeded the maximum tuff background concentration of chromium in tuff (13 mg/kg). Statistical tests were performed to determine if the site sample results for chromium are different than background. The statistical test results are presented in Table F-3.6-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for chromium in tuff is presented in Figure F-3.6-3. Chromium is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 4 of 27 tuff samples, with a maximum concentration of 15.1 mg/kg. Two of the four results also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). Statistical tests were performed to determine if the site sample results for copper are different than background. The statistical test results are presented in Table F-3.6-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for copper in tuff is presented in Figure F-3.6-4. Copper is identified as a COPC in tuff.

Total cyanide was not detected, but had DLs (0.51–0.6 mg/kg) above the BV (0.5 mg/kg) in 12 of 27 tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Cyanide (total) is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 6 of 27 tuff samples, with a maximum concentration of 70.5 mg/kg. Four of the six results also exceeded the maximum background concentration of lead in tuff (15.5 mg/kg). Statistical tests were performed to determine if the site sample results for lead are different than background. The statistical test results are presented in Table F-3.6-1. The result of the Gehan test

indicates that the site sample results are statistically different than background. The box plot for lead in tuff is presented in Figure F-3.6-5. Lead is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in 10 of 27 tuff samples, with a maximum concentration of 33.6 mg/kg. Statistical tests were performed to determine if the site sample results for nickel are different than background. The statistical test results are presented in Table F-3.6-1. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for nickel in tuff is presented in Figure F-3.6-6. Nickel is identified as a COPC in tuff.

Nitrate was detected in 7 of 27 tuff samples and has no BV. Nitrate is identified as a COPC in tuff.

Selenium was detected above the BV (0.3 mg/kg) in 5 of 27 tuff samples, with a maximum concentration of 0.33 mg/kg. Selenium also had DLs (0.51–0.58 mg/kg) above the BV in five tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). Statistical tests were not performed because the background data of selenium in Qbt 2,3,4 tuff are all nondetects. The box plot for selenium in tuff is presented in Figure F-3.6-7. Selenium is identified as a COPC in tuff.

Silver was detected above the BV (1 mg/kg) and above the maximum background concentration of silver in tuff (1.9 mg/kg) in 2 of 27 tuff samples, with concentrations of 4.4 and 11.5 mg/kg. Statistical tests were performed to determine if the site sample results for silver are different than background. The statistical test results are presented in Table F-3.6-1. The results of both the quantile test and the slippage test indicate that the site sample results are not statistically different than background. The box plot for silver in tuff is presented in Figure F-3.6-8. Silver is not identified as a COPC in tuff.

F-3.6.1.2 Inorganic Chemicals in Sediment

All sixteen sediment samples from SWMU 01-001(f) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Antimony was detected above the BV (0.83 mg/kg) in 2 of 16 sediment samples, with both concentrations being 1.1 mg/kg. Results were compared only to the BV because a background dataset for antimony in sediment is not available. The sample results are approximately 20% above the BV. Because antimony was detected slightly and infrequently above background (2 of 16 samples), it is not identified as a COPC in sediment.

Cadmium was detected above the BV (0.4 mg/kg) and above the maximum background concentration of cadmium in sediment (0.18 mg/kg) in 1 of 16 sediment samples, at a concentration of 0.65 mg/kg. Statistical tests were performed to determine if the site sample results for cadmium are different than background. The statistical test results are presented in Table F-3.6-2. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for cadmium in sediment is presented in Figure F-3.6-9. Cadmium is identified as a COPC in sediment.

Calcium was detected above the BV (4420 mg/kg) and above the maximum background concentration of calcium in sediment (4240 mg/kg)in 1 of 16 sediment samples, at a concentration of 15600 mg/kg. Statistical tests were performed to determine if the site sample results for calcium are different than background. The statistical test results are presented in Table F-3.6-2. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for calcium in sediment is presented in Figure F-3.6-10. Calcium is not identified as a COPC in sediment.

Lead was detected above the BV (19.7 mg/kg) in 3 of 16 sediment samples, with a maximum concentration of 24.5 mg/kg. None of the results exceeded the maximum background concentration of lead in sediment (25.6 mg/kg). Statistical tests were performed to determine if the site sample results for lead are different than background. The statistical test results are presented in Table F-3.6-2. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for lead in sediment is presented in Figure F-3.6-11. Lead is identified as a COPC in sediment.

Nitrate was detected in 8 of 16 sediment samples. Nitrate is identified as a COPC in sediment.

Selenium was detected above the BV (0.3 mg/kg) in 1 of 16 sediment samples, at a concentration of 0.33 mg/kg. Selenium also had DLs (0.52–0.59 mg/kg) above the BV in 9 of 16 sediment samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in sediment (0.1 mg/kg). Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetects. The box plot for selenium in sediment is presented in Figure F-3.6-12. Selenium is identified as a COPC in sediment.

Zinc was detected above the BV (60.2 mg/kg) and above the maximum background concentration of zinc in sediment (56.2 mg/kg) in 5 of 16 sediment samples, with a maximum concentration of 102 mg/kg. Statistical tests were performed to determine if the site sample results for zinc are different than background. The statistical test results are presented in Table F-3.6-2. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for zinc in sediment is presented in Figure F-3.6-13. Zinc is not identified as a COPC in sediment.

F-3.6.2 Organic Chemicals at SWMU 01-001(f)

All 43 samples from SWMU 01-001(f) were analyzed for PCBs, SVOCs, and VOCs. Table 6.8-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.8-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 6.8-1.

F-3.6.2.1 Organic Chemicals in Tuff

All 27 tuff samples from SWMU 01-001(f) were analyzed for PCBs, SVOCs, and VOCs.

Acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, bromobenzene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, 4-isopropyltoluene, methylene chloride, phenanthrene, and pyrene were detected in one or more tuff samples and are identified as COPCs in tuff.

F-3.6.2.2 Organic Chemicals in Sediment

All sixteen sediment samples were analyzed for PCBs, SVOCs, and VOCs.

Acenaphthene, acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzoic acid, bis(2-ethylhexyl)phthalate, chrysene, di-n-butylphthalate, dibenz(a,h)anthracene, 1,2-dichlorobenzene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, methylene chloride, phenanthrene, pyrene, and

1,2,4-trimethylbenzene were detected in one or more sediment samples and are identified as COPCs in sediment.

F-3.6.3 Radionuclides at SWMU 01-001(f)

All 43 samples from SWMU 01-001(f) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.8-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.8-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 6.8-3.

F-3.6.3.1 Radionuclides in Tuff

All 27 tuff samples from SWMU 01-001(f) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Cesium-137 was detected in 1 of 27 tuff samples at a concentration of 0.138 pCi/g, and has no tuff FV. Cesium-137 is identified as a COPC in tuff.

Plutonium-239/240 was detected in 3 of 27 tuff samples with a maximum concentration of 0.173 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

Tritium was detected in 1 of 27 tuff samples at a concentration of 0.72 pCi/g, and has no tuff FV. Tritium is identified as a COPC in tuff.

Uranium-234 was detected above the BV (1.98 pCi/g) in 10 of 27 tuff samples, with a maximum concentration of 18.6 pCi/g. Results were compared only to the BV because background dataset for uranium-234 in tuff is not available. Uranium-234 is identified as a COPC in tuff.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in 8 of 27 tuff samples, with a maximum concentration of 0.86 pCi/g. Results were compared only to the BV because background dataset for uranium-235/236 in tuff is not available. Uranium-235/236 is identified as a COPC in tuff.

Uranium-238 was detected above the BV (1.93 pCi/g) in 10 of 27 tuff samples, with a maximum concentration of 19.4 pCi/g. Results were compared only to the BV because background dataset for uranium-238 in tuff is not available. Uranium-238 is identified as a COPC in tuff.

F-3.6.3.2 Radionuclides in Sediment

All sixteen sediment samples were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) and above the maximum background concentration of plutonium-239/240 in sediment (0.065 pCi/g) in 7 of 16 sediment samples, with a maximum concentration of 0.222 pCi/g. Statistical tests were performed to determine if the site sample results for plutonium-239/240 are different than background. The statistical test results are presented in Table F-3.6-3. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for plutonium-239/240 in sediment is presented in Figure F-3.6-14. Plutonium-239/240 is identified as a COPC in sediment.

Uranium-234 was detected above the BV (2.59 pCi/g) and above the maximum background concentration of uranium-234 in sediment (2.5 pCi/g) in 9 of 16 sediment samples, with a maximum concentration of 75.5 pCi/g. Uranium-234 is interpreted as being substantially above background and no further evaluation is necessary. Uranium-234 is identified as a COPC in sediment.

Uranium-235/236 was detected above the BV (0.20 pCi/g) and above the maximum background concentration of uranium-235/236 in sediment (0.16 pCi/g) in 10 of 16 sediment samples, with a maximum concentration of 3.6 pCi/g. Statistical tests were performed to determine if the site sample results for uranium-235/236 are different than background. The statistical test results are presented in Table F-3.6-3. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for uranium-235/236 in sediment is presented in Figure F-3.6-15. Uranium-235/236 is identified as a COPC in sediment.

Uranium-238 was detected above the BV (2.29 pCi/g) and above the maximum background concentration of uranium-238 in sediment (2.1 pCi/g) in 11 of 16 sediment samples, with a maximum concentration of 80.5 pCi/g. Uranium-238 is interpreted as being substantially above background and no further evaluation is necessary. Uranium-238 is identified as a COPC in sediment.

F-3.6.4 Summary of COPCs at SWMU 01-001(f)

The inorganic chemicals identified as COPCs at SWMU 01-001(f) are cadmium, chromium, copper, total cyanide, lead, nickel, nitrate, and selenium.

The organic chemicals identified as COPCs at SWMU 01-001(f) are acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; bromobenzene; chrysene; di-n-butylphthalate; dibenz(a,h)anthracene; 1,2-dichlorobenzene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; methylene chloride; phenanthrene; pyrene; and 1,2,4-trimethylbenzene.

The radionuclides identified as COPCs at SWMU 01-001(f) are cesium-137, plutonium-239/240, tritium, uranium-234, uranium-235/236, and uranium-238.

F-3.6.5 Nature and Extent of Contamination at SWMU 01-001(f)

F-3.6.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs at SWMU 01-001(f) are cadmium, chromium, copper, total cyanide, lead, nickel, nitrate, and selenium. Sample results are presented in Table 6.8-2 and Figure 6.8-2.

Cadmium and copper increase with depth at location 00-603824. Copper also increases with depth at location 00-603825 and is above its BV only in the deepest sample at location 00-603836. The vertical extent of cadmium and copper are not defined. Concentrations of cadmium and copper decreased to below background in samples from locations downslope along the drainage. Therefore, the lateral extent of cadmium and copper are defined.

Chromium and nickel are above their BVs in the deepest samples and increase with depth at nine locations. The highest concentrations of both chromium and nickel were detected in the deepest sample at the location farthest downslope from the source (location 00-603843). Therefore, the lateral and vertical extent of chromium and nickel are not defined.

Cyanide was not detected at the site. Therefore, the lateral and vertical extent of cyanide are defined.

Lead was detected above the BV at six locations and concentrations increased with depth at locations 00-603825 and 00-603837. Concentration of lead in the deepest sample at location 00-603825 (11.4 mg/kg) is only slightly above the BV (11.2 mg/kg). Concentrations of lead decreased to below background in samples from locations downslope from location 00-603837. Therefore, the lateral and vertical extent of lead are defined.

Nitrate was detected in multiple samples with concentrations of 0.21–2 mg/kg. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent for nitrate are defined.

Selenium was detected above the BV in six samples at concentrations of 0.32–0.33 mg/kg. These concentrations are less than 10% above the BV and do not change substantially with depth. Therefore, the lateral and vertical extent of selenium are defined.

F-3.6.5.2 Nature and Extent of Organic COPCs

The organic COPCs at SWMU 01-001(f) are acenaphthene, acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzoic acid, bis(2-ethylhexyl)phthalate, bromobenzene, chrysene, di-n-butylphthalate, dibenz(a,h)anthracene, 1,2-dichlorobenzene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 4-isopropyltoluene, methylene chloride, phenanthrene, pyrene, and 1,2,4-trimethylbenzene. Sample results are presented in Table 6.8-3 and Plate 6.8-1.

Aroclor-1254 was detected in both sample depths at all but one location. Although the concentration decrease or remain essentially constant with depth, it was detected in the deepest samples at concentrations as high as 180 mg/kg. At the location farthest downslope from the source (location 00-603843) the concentrations are 89 mg/kg at the surface and 59 mg/kg in the deepest sample. Therefore, the lateral and vertical extent of Aroclor-1254 are not defined.

Aroclor-1260 was detected at only a few locations within approximately 100 ft of the outfall location, and decrease with depth at all locations where it was detected. Therefore, the lateral and vertical extent of Aroclor-1260 are defined.

Benzoic acid was detected at only one location (00-603836), where its concentration decreases with depth. Therefore, the lateral and vertical extent of benzoic acid are defined.

PAHs were detected in both sample depths at most locations. Their concentrations generally decrease with depth at each location but do not exhibit a clear decrease in concentrations with distance downslope. Therefore, the lateral extent is not defined for PAHs.

Methylene chloride was the only VOC detected at most locations. Its concentration remains essentially constant with depth at most locations, but it was detected more frequently and at slightly higher concentrations at locations farther downslope from the source. Therefore, the lateral extent of methylene chloride is not defined.

Bromobenzene, 1,2-dichlorobenzene, and 1,2,4-trimethylbenzene were each detected at only one location within approximately 100 ft of the outfall and only in the shallower sample at each location. Therefore, the lateral and vertical extent of bromobenzene, 1,2-dichlorobenzene, and 1,2,4-trimethylbenzene are defined.

Bis(2-ethylhexyl)phthalate was detected only at concentrations below the EQL. The concentrations do not change substantially from near the top of the drainage to the farthest downslope locations. Therefore, the lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

F-3.6.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs at SWMU 01-001(f) are cesium-137, plutonium-239/240, tritium, uranium-234, uranium-235/236, and uranium-238. Sample results are presented in Table 6.8-4 and are shown in Figure 6.8-3.

Cesium-137 was detected in the deepest sample at location 00-603826 but was not detected in any other tuff samples, including samples at greater depths at nearby locations. It was either not detected or is below its FV in all sediment samples at the site. Therefore, the lateral and vertical extent of cesium-137 are defined.

Plutonium-239/240 increases with depth at locations 00-603825 and 00-603843 and was detected in both sample depths at the location farthest downslope (00-603843). Therefore, the lateral and vertical extent of plutonium-239/240 are not defined.

Tritium was detected in only one sample, the deepest sample at location 00-603844. Tritium was not detected in samples from greater depths at locations both above and below that location. Therefore, the lateral and vertical extent of tritium are defined.

The concentration of at least one of the uranium isotopes increases with depth or was only detected above its BV in the deeper sample at locations 00-603839, 00-603838, 00-603835, 00-603836, 00-603837, and 00-603843. At the location farthest downslope (00-603843), concentrations increase with depth for all three isotopes and were detected at concentrations higher than at several locations higher in the drainage. Therefore, the lateral and vertical extent of uranium-234, uranium-235/236, and uranium-238 are not defined.

F-3.6.5.4 Summary of Nature and Extent at SWMU 01-001(f)

The lateral and vertical extent of contamination are not defined for chromium and nickel. The vertical extent of contamination is not defined for cadmium and copper.

The lateral and vertical extent of contamination are not defined for Aroclor-1254. The lateral extent of contamination is not defined for PAHs and methylene chloride.

The lateral and vertical extent of contamination are not defined for plutonium-239/240, uranium-234, uranium-235/236, and uranium-238.

F-3.7 SWMU 01-001(g)

A total of 11 samples (7 tuff and 4 sediment) were collected during the 2008–2009 investigation from five locations at SWMU 01-001(g). Table 6.9-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.9-1 is the site map showing sampling locations.

F-3.7.1 Inorganic Chemicals at SWMU 01-001(g)

All 11 samples collected at SWMU 01-001(g) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.9-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.9-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.9-2.

F-3.7.1.1 Inorganic Chemicals in Tuff

Seven tuff samples from SWMU 01-001(g) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Chromium was detected above the BV (7.14 mg/kg) in six of seven tuff samples, with a maximum sample concentration of 27.9 mg/kg. Four of the six results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). The box plot for chromium in tuff is presented in Figure F-3.7-1. Chromium is identified as COPCs in tuff.

Total cyanide was not detected, but had DLs (all 0.51 mg/kg) above the BV (0.5 mg/kg) in three of seven tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. The DLs are essentially equal to the BV. Therefore, total cyanide is not identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in four of seven tuff samples, with a maximum concentration of 13.4 mg/kg. The box plot for nickel in tuff is presented in Figure F-3.7-2. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in one or more tuff samples and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was not detected above the BV (0.3 mg/kg), but had a DL (0.52 mg/kg) above the BV and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in one of seven tuff samples. Selenium is identified as a COPC in tuff.

F-3.7.1.2 Inorganic Chemicals in Sediment

Four sediment samples from SWMU 01-001(g) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Antimony was detected above the BV (0.83 mg/kg) in one of four sediment samples, at a concentration of 1.8 mg/kg. Antimony also had a DL (1.4 mg/kg) above the BV in one sediment sample. Results were compared only to the BV because a background dataset for antimony in sediment is not available. Antimony is identified as a COPC in sediment.

Lead was detected above the BV (19.7 mg/kg) and above the maximum background concentration of lead in sediment (25.6 mg/kg) in two of four sediment samples, with concentrations of 30.5 and 86.8 mg/kg. The box plot for lead in sediment is presented in Figure F-3.7-3. Lead is identified as a COPC in sediment.

Nitrate and perchlorate were detected in one or more sediment samples and have no BVs. Nitrate and perchlorate are identified as COPCs in sediment.

F-3.7.2 Organic Chemicals at SWMU 01-001(g)

All 11 samples collected at SWMU 01-001(g) were analyzed for PCBs, SVOCs, and VOCs. Table 6.9-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.9-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.9-3.

F-3.7.2.1 Organic Chemicals in Tuff

Seven tuff samples from SWMU 01-001(g) were analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1260 and methylene chloride were detected in two or more tuff samples and are identified as COPCs in tuff.

F-3.7.2.2 Organic Chemicals in Sediment

Four sediment samples from SWMU 01-001(g) were analyzed for PCBs, SVOCs, and VOCs.

Acetone, Aroclor-1260, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, and methylene chloride were detected in one or more sediment samples and are identified as COPCs in sediment.

F-3.7.3 Radionuclides at SWMU 01-001(g)

All 11 samples collected at SWMU 01-001(g) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.9-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.9-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 6.9-4.

F-3.7.3.1 Radionuclides in Tuff

Seven tuff samples from SWMU 01-001(g) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected in all seven tuff samples with a maximum concentration of 29.3 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in three of seven tuff samples, with a maximum concentration of 0.224 pCi/g. Results were compared only to the BV because background dataset for uranium-235/236 in tuff is not available. Uranium-235/236 is identified as a COPC in tuff.

F-3.7.3.2 Radionuclides in Sediment

Four sediment samples from SWMU 01-001(g) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Americium-241 was detected above the FV (0.040 pCi/g) and above the maximum background concentration of americium-241 in sediment (0.038 pCi/g) in two of four sediment samples, with

concentrations of 0.51 and 0.69 pCi/g. The box plot for americium-241 in sediment is presented in Figure F-3.7-4. Americium-241 is identified as a COPC in sediment.

Plutonium-239/240 was detected above the BV (0.068 pCi/g) in all four sediment samples, with a maximum concentration of 189 pCi/g. Plutonium-239/240 is interpreted as being substantially above background and no further evaluation is necessary. Plutonium-239/240 is identified as a COPC in sediment.

Uranium-234 was detected above the BV (2.59 pCi/g) and above the maximum background concentration of uranium-234 in sediment (2.5 pCi/g) in one of four sediment samples, at a concentration of 3.94 pCi/g. The box plot for uranium-234 in sediment is presented in Figure F-3.7-5. Uranium-234 is identified as a COPC in sediment.

Uranium-235/236 was detected above the BV (0.20 pCi/g) and above the maximum background concentration of uranium-235/236 in sediment (0.16 pCi/g) in one of four sediment samples, at a concentration of 0.221 pCi/g. The box plot for uranium-235/236 in sediment is presented in Figure F-3.7-6. Uranium-235/236 is identified as a COPC in sediment.

F-3.7.4 Summary of COPCs at SWMU 01-001(g)

The inorganic chemicals identified as COPCs at SWMU 01-001(g) are antimony, chromium, lead, nickel, nitrate, perchlorate, and selenium.

The organic chemicals identified as COPCs at SWMU 01-001(g) are acetone, Aroclor-1260, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, and methylene chloride.

The radionuclides identified as COPCs at SWMU 01-001(g) are americium-241, plutonium-239/240, uranium-234, and uranium-235/236.

F-3.7.5 Nature and Extent of Contamination at SWMU 01-001(g)

F-3.7.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs at SWMU 01-001(g) are antimony, chromium, lead, nickel, nitrate, perchlorate, and selenium. Sample results for the inorganic COPCs identified at SWMU 01-001(g) are presented in Table 6.9-2 and Figure 6.9-2.

Antimony was detected above its BV only in the shallower sample at location 00-603846 and decreases with depth. Therefore, the lateral and vertical extent of antimony are defined.

Lead was detected above its BV in the shallower sample at two locations (00-603849 and 00-603846), and decreases with depth. Therefore, the lateral and vertical extent of lead are defined.

Chromium was detected above its BV at four of five locations, and increases with depth in each of those locations. Therefore, the vertical extent of chromium is not defined. The concentration of chromium decreases with distance downslope from that location, and was not detected above its BV at location 00-603846. Therefore, the lateral extent of chromium is defined.

Nickel was detected above its BV at three of five locations and concentrations increased with depth at these three locations. Therefore, the vertical extent of nickel is not defined. At the outfall location (00-603849) the nickel concentration is only slightly above the maximum background concentration

(7 mg/kg), and at location 00-603846 downslope of the outfall, nickel was not detected above its BV. Therefore, the lateral extent of nickel is defined.

Nitrate was detected in six samples at concentrations of 0.12–1.6 mg/kg. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent for nitrate are defined.

Perchlorate was detected in three samples with a maximum concentration of 0.0044 mg/kg. Therefore, the lateral and vertical extent of perchlorate are defined.

Selenium was not detected at the site. Therefore, the lateral and vertical extent of selenium are defined.

F-3.7.5.2 Nature and Extent of Organic COPCs

The organic COPCs at SWMU 01-001(g) are acetone, Aroclor-1260, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, and methylene chloride. Sample results for the organic COPCs identified at SWMU 01-001(g) are presented in Table 6.9-3 and Figure 6.9-3.

Acetone was detected in only one sample, and decreases with depth. Therefore, the lateral and vertical extent of acetone are defined.

Aroclor-1260 was detected at all four sampling locations but decreases with depth. The concentration of Aroclor-1260 decreases downslope. Therefore, the lateral and vertical extent of Aroclor-1260 are defined.

Bis(2-ethylhexyl)phthalate was detected at only two locations, and decreases with depth. Therefore, the lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Di-n-butylphthalate was detected in only one sample and decreases with depth. Therefore, the lateral and vertical extent of di-n-butylphthalate are defined.

Methylene chloride was detected at three of four locations, and was detected in the deepest sample at each location. All concentrations were near or below the EQLs. The concentrations decrease with depth at one location. Therefore, the lateral and vertical extent of methylene chloride are defined.

F-3.7.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs at SWMU 01-001(g) are americium-241, plutonium-239/240, uranium-234, and uranium-235/236. Sample results for the radionuclide COPCs identified at SWMU 01-001(g) are presented in Table 6.9-4 and Figure 6.9-4.

Americium-241 was detected above its FV in two sediment samples and decreases with depth. The concentration of americium-241 decreases in the downslope direction. Therefore, the lateral and vertical extent of americium-241 are defined.

Plutonium-239/240 was detected above its FV in all sediment samples and was detected in all tuff samples. The concentrations decrease with depth at all locations, but plutonium-239/240 was detected in the deepest samples at concentrations as high as 4.01 pCi/g (location 00-603846). It also was detected in all samples including those at the locations farthest downslope. Therefore, the lateral extent of plutonium-239/240 is not defined.

Uranium-234 was detected above its BV in only one sample, and decreases with depth. Therefore, the lateral and vertical extent of uranium-234 are defined.

Uranium-235/236 was detected above its BV in the deepest sample at two locations (00-603847 and 00-603848). Uranium-235/236 was not detected in the shallow sample at those locations. The concentrations in the deeper samples are less than twice the BV. The concentration of uranium-235/236 decreases downslope. Therefore, the lateral and vertical extent of uranium-235/236 are defined.

F-3.7.5.4 Summary of Nature and Extent at SWMU 01-001(g)

The lateral and vertical extent of contamination are defined for all inorganic COPCs, except for the vertical extent of chromium and nickel.

The lateral and vertical extent of contamination are defined for all organic COPCs.

The lateral extent of contamination is not defined for plutonium-239/240.

F-3.8 SWMU 01-001(o)

A total of 18 samples (9 soil and fill and 9 tuff) were collected during the 2008–2009 investigation from nine locations at SWMU 01-001(o). Table 6.10-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.10-1 is the site map showing sampling locations.

F-3.8.1 Inorganic Chemicals at SWMU 01-001(o)

All 18 samples collected at SWMU 01-001(o) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.10-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.10-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.10-2.

F-3.8.1.1 Inorganic Chemicals in Soil

Nine soil and fill samples from SWMU 01-001(o) were analyzed for TAL metals, perchlorate, and cyanide (total).

Antimony was not detected, but had a DL (1.4 mg/kg) above the BV (0.83 mg/kg) and above the maximum soil background concentration (1 mg/kg) in one of nine soil and fill samples. Antimony is identified as a COPC in soil.

Cadmium was detected above the BV (0.4 mg/kg) in two of nine soil and fill samples, with concentrations of 1.5 and 4 mg/kg. One sample concentration also exceeded the maximum background concentration of cadmium in soil (2.6 mg/kg). The box plot for cadmium in soil is presented in Figure F-3.8-1. Therefore, cadmium is identified as a COPC in soil.

Calcium was detected above the BV (6120 mg/kg) in one of nine soil and fill samples, at a concentration of 13200 mg/kg. The sample result did not exceed the maximum background concentration of calcium in soil (14000 mg/kg). The box plot for calcium in soil is presented in Figure F-3.8-2. Calcium is not identified as a COPC in soil.

Chromium was detected above the BV (19.3 mg/kg) in two of nine soil and fill samples, with concentrations of 24.2 and 27.1 mg/kg. The sample results did not exceed the maximum background

concentration of chromium in soil (36.5 mg/kg). The box plot for chromium in soil is presented in Figure F-3.8-3. Chromium is not identified as a COPC in soil.

Copper was detected above the BV (14.7 mg/kg) and above the maximum background concentration of copper in soil (16 mg/kg) in two of nine soil and fill samples, with concentrations of 49.7 and 236 mg/kg. The box plot for copper in soil is presented in Figure F-3.8-4. Copper is identified as a COPC in soil.

Total cyanide was not detected but had DLs (0.52–0.58 mg/kg) above the BV (0.5 mg/kg) in four of nine soil and fill samples. Results were compared only to the BV because a background dataset for total cyanide in soil is not available. Total cyanide is identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) and above the maximum background concentration of lead in soil (28 mg/kg) in two of nine soil and fill samples, with concentrations of 40.1 and 62.7 mg/kg. The box plot for lead in soil is presented in Figure F-3.8-5. Lead is identified as a COPC in soil.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in soil (also 0.1 mg/kg) in four of nine soil and fill samples, with a maximum concentration of 0.466 mg/kg. The box plot for mercury in soil is presented in Figure F-3.8-6. Mercury is identified as a COPC in soil.

Nickel was detected above the BV (15.4 mg/kg) in one of nine soil and fill samples, at a concentration of 15.8 mg/kg. The sample result did not exceed the maximum background concentration of nickel in soil (29 mg/kg). The box plot for nickel in soil is presented in Figure F-3.8-7. Nickel is not identified as a COPC in soil.

Nitrate and perchlorate were detected in two or more soil or fill samples and have no BVs. Nitrate and perchlorate are identified as COPCs in soil and fill.

Silver was detected above the BV (1 mg/kg) in one of nine soil and fill samples, at a concentration of 1.5 mg/kg. Results were compared only to the BV because a background dataset for silver in soil is not available. Silver is identified as a COPC in soil.

Zinc was detected above the BV (48.8 mg/kg) in three of nine soil and fill samples, with a maximum concentration of 218 mg/kg. One of the three results also exceeded the maximum background concentration for zinc in soil (75.5 mg/kg). The box plot for zinc in soil is presented in Figure F-3.8-8. Zinc is identified as a COPC in soil.

F-3.8.1.2 Inorganic Chemicals in Tuff

Nine tuff samples from SWMU 01-001(o) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Chromium was detected above the BV (7.14 mg/kg) in eight of nine tuff samples, with a maximum sample concentration of 22.2 mg/kg. Three of the eight results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). The box plot for chromium in tuff is presented in Figure F-3.8-9. Chromium is identified as a COPC in tuff.

Total cyanide was not detected above the BV (0.5 mg/kg), but had DLs (0.53–0.62 mg/kg) above the BV in three of nine tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) and above the maximum tuff background concentration (15.5 mg/kg) in two of nine tuff samples, with concentrations of 20 and 29.4 mg/kg. The box plot for lead in tuff is presented in Figure F-3.8-10. Lead is identified as a COPC in tuff.

Mercury was detected above the BV (0.1 mg/kg) in one of nine tuff samples, at a concentration of 0.242 mg/kg. Results were compared only to the BV because a background dataset for mercury in tuff is not available. Mercury is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in three of nine tuff samples, with a maximum concentration of 11.2 mg/kg. Two of the three sample results also exceeded the maximum background concentration of nickel in tuff (7 mg/kg). The box plot for nickel in tuff is presented in Figure F-3.8-11. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in one or more tuff samples and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was not detected above the BV (0.3 mg/kg), but had two DLs (0.55 and 0.52 mg/kg) above the BV and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in two of nine tuff samples. Selenium is identified as a COPC in tuff.

F-3.8.2 Organic Chemicals at SWMU 01-001(o)

All 18 samples collected at SWMU 01-001(o) were analyzed for PCBs, SVOCs, and VOCs. Table 6.10-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.10-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.10-3.

F-3.8.2.1 Organic Chemicals in Soil

Nine soil and fill samples from SWMU 01-001(o) were analyzed for PCBs, SVOCs, and VOCs.

Acetone, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzoic acid, bis(2-ethylhexyl)phthalate, chrysene, di-n-butylphthalate, fluoranthene, phenanthrene, pyrene were detected in one or more soil and fill samples, and are identified as COPCs in soil and fill.

F-3.8.2.2 Organic Chemicals in Tuff

Nine tuff samples from SWMU 01-001(o) were analyzed for PCBs, SVOCs, and VOCs.

Acetone, Aroclor-1260, methylene chloride, and 1,2,4-trimethylbenzene were detected in one or more tuff samples and are identified as COPCs in tuff.

F-3.8.3 Radionuclides at SWMU 01-001(o)

All 18 samples collected at SWMU 01-001(o) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.10-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.10-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 6.10-4.

F-3.8.3.1 Radionuclides in Soil

Nine soil and fill samples from SWMU 01-001(o) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Americium-241 was detected in one of nine soil and fill samples at a depth where the FV does not apply, at a concentration of 0.155 pCi/g. Americium-241 is identified as a COPC in soil.

Cesium-137 was detected in three of nine soil and fill samples at depths where the FV does not apply, with a maximum concentration of 0.304 pCi/g. Cesium-137 is identified as a COPC in soil.

Plutonium-239/240 was detected in six of nine soil and fill samples at depths where the FV does not apply, with a maximum concentration of 6.51 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

Strontium-90 was detected in one of nine soil and fill samples at a depth where the FV does not apply, at a concentration of 0.56 pCi/g. Strontium-90 is identified as a COPC in soil.

F-3.8.3.2 Radionuclides in Tuff

Nine tuff samples from SWMU 01-001(o) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Americium-241 was detected in one of nine tuff samples at a concentration of 0.119 pCi/g, and has no tuff FV. Americium-241 is identified as a COPC in tuff.

Cesium-137 was detected in one of nine tuff samples at a concentration of 0.298 pCi/g, and has no tuff FV. Cesium-137 is identified as a COPC in tuff.

Plutonium-239/240 was detected in four of nine tuff samples with a maximum concentration of 1.13 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

Strontium-90 was detected in two of nine tuff samples with concentrations of 0.41 and 0.34 pCi/g, and has no tuff FV. Strontium-90 is identified as a COPC in tuff.

Tritium was detected in one of nine tuff samples at a concentration of 1.33 pCi/g, and has no tuff FV. Tritium is identified as a COPC in tuff.

F-3.8.4 Summary of COPCs at SWMU 01-001(o)

The inorganic chemicals identified as COPCs at SWMU 01-001(o) are antimony, cadmium, chromium, copper, total cyanide, lead, mercury, nickel, nitrate, perchlorate, selenium, silver, and zinc.

The organic chemicals identified as COPCs at SWMU 01-001(o) are acetone, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzoic acid, bis(2-ethylhexyl)phthalate, chrysene, di-n-butylphthalate, fluoranthene, methylene chloride, phenanthrene, pyrene, and 1,2,4-trimethylbenzene.

The radionuclides identified as COPCs at SWMU 01-001(o) are americium-241, cesium-137, plutonium-239/240, strontium-90, and tritium.

F-3.8.5 Nature and Extent of Contamination at SWMU 01-001(o)

F-3.8.5.1 Nature and Extent of Inorganic COPCs

The inorganic chemicals identified as COPCs at SWMU 01-001(o) are antimony, cadmium, chromium, copper, total cyanide, lead, mercury, nickel, nitrate, perchlorate, selenium, silver, and zinc. Sample results for the inorganic COPCs identified at SWMU 01-001(o) are presented in Table 6.10-2 and are shown in Figure 6.10-2.

Antimony, cyanide, and selenium were not detected at the site. Therefore, the lateral and vertical extent of antimony, cyanide, and selenium are defined.

Cadmium was detected at only one location 00-603858 and concentrations increased with depth. However, the media at location 00-603858 are all fill material, and cadmium was detected below background in all samples downslope from this location. Therefore, the lateral and vertical extent of cadmium are defined.

Chromium, copper, lead, mercury, nickel, silver, and zinc were detected above their BVs in the deepest sample at location 00-603858, and all increase with depth. Chromium increases with depth also at locations 00-603850, 00-603854, 00-603857, 00-603856, 00-603853, and 00-603852. Lead increases with depth at location 00-603857, and nickel increases with depth at location 00-603850. Therefore, the vertical extent of the inorganic COPCs is not defined. The concentrations of the inorganic COPCs decrease with distance downslope from location 00-603858. Therefore, the lateral extent is defined for the inorganic COPCs.

Nitrate was detected in multiple samples at concentrations 0.086–1.9 mg/kg. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected at three locations and concentrations decreased with depth at two of the three locations. Perchlorate was detected in the deepest sample at location 00-603854, but it was not detected in samples downslope from this location. Therefore, the lateral and vertical extent of perchlorate are defined.

F-3.8.5.2 Nature and Extent of Organic COPCs

The organic COPCs at SWMU 01-001(o) are acetone, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzoic acid, bis(2-ethylhexyl)phthalate, chrysene, di-n-butylphthalate, fluoranthene, methylene chloride, phenanthrene, pyrene, and 1,2,4-trimethylbenzene. Sample results for the organic COPCs identified at SWMU 01-001(o) are presented in Table 6.10-3 and are shown in Figure 6.10-3.

Aroclor-1254 was detected at three locations. At location 00-603858 (an outfall), it decreases with depth. At location 00-603852, Aroclor-1254 was detected only in the surface sample but at a concentration (3.2 mg/kg) that represents an increase in the downslope direction from the outfall. At location 00-603851, Aroclor-1254 was detected only in the deeper sample. Therefore, the lateral and vertical extent of Aroclor-1254 are not defined.

Di-n-butylphthalate was detected at the outfall location (00-603858) and increases with depth. Di-n-butylphthalate decreases with depth at location 00-603853 and increases downslope. The lateral and vertical extent of di-n-butylphthalate is not defined.

Bis(2-ethylhexyl)phthalate also increases with depth at location 00-603858, but its concentration is low (0.12 mg/kg) and decreases downslope. The lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Methylene chloride was detected only in the deeper sample at location 00-603857. Its concentration (0.00073 mg/kg) is below the EQL. Therefore, the lateral and vertical extent of methylene chloride are defined.

Trimethylbenzene[1,2,4-] was detected in both samples at location 00-603850 with little change in concentration. However, both sample concentrations are below the EQL, and 1,2,4-trimethylbenzene was not detected in any other samples at the site. Therefore, the lateral and vertical extent of 1,2,4-trimethylbenzene are defined.

Aroclor-1260, acetone, and benzoic acid were detected at one or more locations, and decrease with depth. PAHs were detected only at location 00-603852, and decrease with depth. Therefore, the lateral and vertical extent of all other organic COPCs are defined.

F-3.8.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs at SWMU 01-001(o) are americium-241, cesium-137, plutonium-239/240, strontium-90, and tritium. Sample results for the radionuclide COPCs identified at SWMU 01-001(o) are presented in Table 6.10-4 and are shown in Figure 6.10-4.

Americium-241 was detected in the deepest sample at location 00-603854. It was also detected in the shallow sample at downgradient location 00-603855. The lateral and vertical extent of americium-241 are not defined.

Cesium-137 was detected in the shallower samples at locations 00-603853, 00-603855, 00-603857, and 00-603854 and decreases with depth. Therefore, the vertical extent of cesium-137 is defined. However, the highest detected concentration (0.298 pCi/g) is at location 00-603857, which has no sampling location downslope. Therefore, the lateral extent of cesium-137 is not defined.

Plutonium-239/240 was detected in the deepest samples at locations 00-603858 (an outfall), 00-603854, 00-603855, 00-603853, and 00-603852 and decreases with depth except at location 00-603858. The highest detected concentration (6.51 pCi/g) is in the upper sample at location 00-603854, and the downslope sample at location 00-603855 has a concentration of 6.14 pCi/g. Therefore, the lateral and vertical extent of plutonium-239/240 are not defined.

Strontium-90 was detected in only two samples and decreases with depth. There were no sampling locations downslope of this location. Therefore, the lateral extent of strontium-90 is not defined.

Tritium was detected in only one sample, the deepest sample at location 00-603850. The single concentration is low (1.33 pCi/g). Therefore, the lateral and vertical extent of tritium are defined.

F-3.8.5.4 Summary of Nature and Extent at SWMU 01-001(o)

The vertical extent is not defined for several inorganic COPCs.

The lateral and vertical extent are defined for all organic COPCs except Aroclor-1254 and di-n-butylphthalate.

The lateral and vertical extent are not defined for americium-241 and plutonium-239/240. The lateral extent is not defined for cesium-137 and strontium-90.

F-3.9 SWMU 01-001(s)

A total of 26 samples (all tuff) were collected during the 2008–2009 investigation from 13 locations at SWMU 01-001(s). Table 6.11-1 summarizes the samples collected and the requested analyses for each sample. Plate 6.11-1 is the site map showing sampling locations.

F-3.9.1 Inorganic Chemicals at SWMU 01-001(s)

All 26 samples collected at SWMU 01-001(s) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.11-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.11-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown on Plate 6.11-2.

F-3.9.1.1 Inorganic Chemicals in Tuff

Twenty-six tuff samples from SWMU 01-001(s) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Aluminum was detected above the BV (7340 mg/kg) in 5 of 26 tuff samples, with a maximum concentration of 9510 mg/kg. Three of the five results also exceeded the maximum background concentration in tuff (8370 mg/kg). Statistical tests were performed to determine if the site sample results for aluminum are different than background. The statistical test results are presented in Table F-3.9-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for aluminum in tuff is presented in Figure F-3.9-1. Aluminum is identified as a COPC in tuff.

Antimony was not detected above the BV (0.5 mg/kg), but had DLs (0.55–1.24 mg/kg) above the BV and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in 8 of 26 tuff samples. Antimony is identified as a COPC in tuff.

Arsenic was detected above the BV (2.79 mg/kg) in 2 of 26 tuff samples, with concentrations of 3 and 2.8 mg/kg. Both sample concentrations are below the maximum background concentration of arsenic in tuff (5 mg/kg). Statistical tests were performed to determine if the site sample results for arsenic are different than background. The statistical test results are presented in Table F-3.9-1. The results of both the quantile test and the slippage test indicate that the site sample results are not statistically different than background. The box plot for arsenic in tuff is presented in Figure F-3.9-2. Arsenic is not identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) in 12 of 24 tuff samples, with a maximum concentration of 272 mg/kg. Ten of the 12 results also exceeded the maximum background concentration of barium in tuff (51.6 mg/kg). Statistical tests were performed to determine if the site sample results for barium are different than background. The statistical test results are presented in Table F-3.9-1. The result of the

Gehan test indicates that the site sample results are statistically different than background. The box plot for barium in tuff is presented in Figure F-3.9-3. Barium is identified as a COPC in tuff.

Cadmium was detected above the BV (1.63 mg/kg) and above the maximum background concentration of cadmium in tuff (1.5 mg/kg) in 1 of 26 tuff samples, at a concentration of 2.3 mg/kg. Statistical tests were performed to determine if the site sample results for cadmium are different than background. The statistical test results are presented in Table F-3.9-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for cadmium in tuff is presented in Figure F-3.9-4. Cadmium is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum background concentration of calcium in tuff (2230 mg/kg) in 2 of 26 tuff samples, with concentrations of 2720 and 3560 mg/kg. Statistical tests were performed to determine if the site sample results for calcium are different than background. The statistical test results are presented in Table F-3.9-1. The result of the Gehan test indicates that the site sample results are statistically different than background. However, the sample concentrations are less than twice the BV. Based on EPA's Risk Assessment Guidance for Superfund, section 5.9.4, page 5-23, calcium may be eliminated as a COPC if detected infrequently above background (2 of 26 tuff samples) and not substantially above background. The box plot for calcium in tuff is presented in Figure F-3.9-5. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 8 of 26 tuff samples, with a maximum concentration of 27.4 mg/kg. Five of the eight results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). Statistical tests were performed to determine if the site sample results for chromium are different than background. The statistical test results are presented in Table F-3.9-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for chromium in tuff is presented in Figure F-3.9-6. Chromium is identified as a COPC in tuff.

Cobalt was detected above the BV (3.14 mg/kg) and above the maximum tuff background concentration of cobalt in tuff (also 3.14 mg/kg) in 3 of 26 tuff samples, with a maximum concentration of 4.8 mg/kg. Statistical tests were performed to determine if the site sample results for cobalt are different than background. The statistical test results are presented in Table F-3.9-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for cobalt in tuff is presented in Figure F-3.9-7. Cobalt is not identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 10 of 26 tuff samples, with a maximum concentration of 35.1 mg/kg. Five of the 10 results also exceeded the maximum tuff background concentration of copper in tuff (6.2 mg/kg). Statistical tests were performed to determine if the site sample results for copper are different than background. The statistical test results are presented in Table F-3.9-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for copper in tuff is presented in Figure F-3.9-8. Copper is identified as a COPC in tuff.

Total cyanide was detected above the BV (0.5 mg/kg) in 1 of 26 tuff samples, at a concentration of 0.84 mg/kg. Total cyanide also had DLs (0.53–0.86 mg/kg) above the BV in 12 of 26 tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 10 of 26 tuff samples, with a maximum concentration of 39.6 mg/kg. Three of the 10 results also exceeded the maximum background concentration of lead in tuff (15.5 mg/kg). Statistical tests were performed to determine if the site sample results for lead are different than background. The statistical test results are presented in Table F-3.9-1. The result of the Gehan test

indicates that the site sample results are statistically different than background. The box plot for lead in tuff is presented in Figure F-3.9-9. Lead is identified as a COPC in tuff.

Magnesium was detected above the BV (1690 mg/kg) in 1 of 26 tuff samples, at a concentration of 2060 mg/kg. The sample result is below the maximum background concentration of magnesium in tuff (2820 mg/kg). Statistical tests were performed to determine if the site sample results for magnesium are different than background. The statistical test results are presented in Table F-3.9-1. The result of the Gehan test indicates that the site sample results are statistically different than background. However, the sample concentration is less than twice the BV. Based on EPA's Risk Assessment Guidance for Superfund, section 5.9.4, page 5-23, magnesium may be eliminated as a COPC if detected infrequently above background (1 of 26 tuff samples) and not substantially above background. The box plot for magnesium in tuff is presented in Figure F-3.9-10. Magnesium is not identified as a COPC in tuff.

Mercury was detected above the BV (0.1 mg/kg) in 2 of 26 tuff samples, with concentrations of 0.111 and 0.141 mg/kg. Results were compared only to the BV because a background dataset for mercury in tuff is not available. Mercury is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in 10 of 26 tuff samples, with a maximum concentration of 13.7 mg/kg. Nine of the ten sample results also exceeded the maximum background concentration of nickel in tuff (7 mg/kg). Statistical tests were performed to determine if the site sample results for nickel are different than background. The statistical test results are presented in Table F-3.9-1. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for nickel in tuff is presented in Figure F-3.9-11. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were each detected in one or more tuff sample and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was detected above the BV (0.3 mg/kg) in 4 of 26 tuff samples, with a maximum concentration of 0.63 mg/kg. Selenium also had DLs (0.57–1.22 mg/kg) above the BV in 10 tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). Statistical tests were not performed because the background data of selenium in Qbt 2,3,4 tuff are all nondetects. The box plot for selenium in tuff is presented in Figure F-3.9-12. Selenium is identified as a COPC in tuff.

Silver was detected above the BV (1 mg/kg) and above the maximum background concentration of silver in tuff (1.9 mg/kg) in 1 of 26 tuff samples, at a concentration of 5.4 mg/kg. Statistical tests were performed to determine if the site sample results for silver are different than background. The statistical test results are presented in Table F-3.9-1. The results of both the quantile test and the slippage test indicate that the site sample results are not statistically different than background. The box plot for silver in tuff is presented in Figure F-3.9-13. Silver is not identified as a COPC in tuff.

F-3.9.2 Organic Chemicals at SWMU 01-001(s)

All 26 samples collected at SWMU 01-001(s) were analyzed for PCBs, SVOCs, and VOCs. Table 6.11-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.11-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 6.11-3.

F-3.9.2.1 Organic Chemicals in Tuff

Twenty-six tuff samples from SWMU 01-001(s) were analyzed for PCBs, SVOCs, and VOCs.

Acenaphthene, acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, methylene chloride, naphthalene, phenanthrene, 1-propylbenzene, and pyrene were detected in one or more tuff samples, and are identified as COPCs in tuff.

F-3.9.3 Radionuclides at SWMU 01-001(s)

All 26 samples collected at SWMU 01-001(s) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.11-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.11-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown on Plate 6.11-4.

F-3.9.3.1 Radionuclides in Tuff

Twenty-six tuff samples from SWMU 01-001(s) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected in 3 of 26 tuff samples with a maximum concentration of 0.564 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

Tritium was detected in 3 of 26 tuff samples with a maximum concentration of 0.94 pCi/g, and has no tuff FV. Tritium is identified as a COPC in tuff.

Uranium-234 was detected above the BV (1.98 pCi/g) in 1 of 26 tuff samples, at a concentration of 1.99 pCi/g. The sample concentration was equivalent to the BV. Results were compared only to the BV because background dataset for uranium-234 in tuff is not available. Because uranium-234 was detected slightly and infrequently above background (1 of 26 samples), it is not identified as a COPC in tuff.

F-3.9.4 Summary of COPCs at SWMU 01-001(s)

The inorganic chemicals identified as COPCs at SWMU 01-001(s) are aluminum, antimony, barium, cadmium, chromium, copper, total cyanide, lead, mercury, nickel, nitrate, perchlorate, and selenium.

The organic chemicals identified as COPCs at SWMU 01-001(s) are acenaphthene, acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, methylene chloride, naphthalene, phenanthrene, 1-propylbenzene, and pyrene.

The radionuclides identified as COPCs at SWMU 01-001(s) are plutonium-239/240 and tritium.

F-3.9.5 Nature and Extent of Contamination at SWMU 01-001(s)

F-3.9.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs at SWMU 01-001(s) are aluminum, antimony, barium, cadmium, chromium, copper, total cyanide, lead, mercury, nickel, nitrate, perchlorate, and selenium. Sample results are presented in Table 6.11-1 and Plate 6.11-2.

Aluminum was detected above its BV at four locations, with a maximum concentration of 9510 mg/kg at location 03-603860. Aluminum is below the BV in the deeper sample at that location. The concentration of aluminum increases slightly with depth (from 8320 to 8760 mg/kg) at location 03-603864, but both concentrations are near the maximum background concentration (8370 mg/kg). Therefore, the lateral and vertical extent of aluminum are defined.

Antimony was not detected but had DLs above the BV at five locations. The maximum DL (1.24 mg/kg) is less than 3 times the BV. At all five locations, antimony concentrations either decrease with depth to below the BV or are relatively unchanged. Therefore, the lateral and vertical extent of antimony are defined.

Barium was detected above its BV at seven locations. It was detected above the BV in only the deeper sample at two locations, but both concentrations are at or below the maximum background concentration (51.6 mg/kg). Barium concentrations in the western portion of SWMU 01-001(s) are approximately 3 times the maximum background concentration and do not decrease substantially with depth. Therefore, the lateral and vertical extent of barium are not defined.

Cadmium was detected above its BV only once, at less than twice the BV. Therefore, the lateral and vertical extent of cadmium are defined.

Chromium was detected above its BV at five locations. At two locations its concentration decreases with depth, and at the other three locations the concentration increases slightly or remains relatively unchanged in the deeper sample. The highest chromium concentration (27.4 mg/kg at location 03-603862) is approximately twice the maximum background concentration (13 mg/kg). Chromium was not detected above its BV in the western portion of the site. Therefore, the lateral and vertical extent of chromium are defined.

Copper was detected above its BV at six locations. It increases with depth or is above the BV only in the deeper sample at four locations. At the western end of the site (location 03-603859), copper was detected at 35.1 mg/kg, more than 5 times the maximum background concentration. Therefore, the lateral and vertical extent of copper are not defined.

Cyanide (total) was detected above its BV only once. The detected concentration (0.84 mg/kg) and all DLs above the BV are less than twice the BV. At location 03-603871, the only location where cyanide (total) was detected, the concentration decreases with depth. Cyanide (total) was not reported above its BV in the western portion of the site. Therefore, the lateral and vertical extent of cyanide (total) are defined.

Lead was detected above its BV at seven locations. The maximum concentration of lead (39.6 mg/kg) is in the deeper sample at location 03-603860, near the western end of the site. Therefore, the lateral and vertical extent of lead are not defined.

Mercury was detected above its BV in only two samples and decreases with depth. Therefore, the lateral and vertical extent of mercury are defined.

Nickel was detected above its BV in ten samples at five locations. The concentrations increase slightly with depth at two of the five locations, and nickel was detected above the BV in both samples at location 03-603859 near the western end of the site. Therefore, the lateral and vertical extent of nickel are not defined.

Nitrate was detected in multiple samples with concentrations of 0.077–4.5 mg/kg. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected only in the deepest sample at location 00-603868 at a concentration of 0.0039 mg/kg. This concentration is near the EDL. Therefore, the lateral and vertical extent of perchlorate are defined.

Selenium was detected above its BV in only four samples. Where it was detected, the concentrations of selenium decrease with depth. Selenium was not detected above its BV in the western portion of SWMU 01-001(s). Therefore, the lateral and vertical extent of selenium are defined.

F-3.9.5.2 Nature and Extent of Organic COPCs

The organic COPCs at SWMU 01-001(s) are acenaphthene, acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, methylene chloride, naphthalene, phenanthrene, 1-propylbenzene, and pyrene. Sample results are presented in Table 6.11-3 and Plate 6.11-3.

PAHs were detected at one or two locations (03-603863 and 03-603865). Concentrations of all PAHs increase with depth at location 03-603865. Most PAH concentrations are below the EQLs. PAHs were not detected in samples deeper than 5 ft bgs at any location within SWMU 01-001(s). Location 03-603865 is near the intersection of two major streets, in the paved parking area for a gas station. The low detected concentrations likely do not represent a release from Laboratory activities. The lateral and vertical extent of PAHs are defined.

Acetone was detected in eight samples at five locations. All concentrations are low and near or below the EQLs, and concentrations do not increase substantially with depth. Therefore, the lateral and vertical extent of acetone are defined.

Aroclor-1254 was detected in only three samples at two locations. The concentrations decrease with depth at location 03-603864. Aroclor-1254 was only detected (0.015 mg/kg) in the deeper sample at location 03-603867. The lateral and vertical extent of Aroclor-1254 are defined.

Aroclor-1260 was detected in four samples from two locations. All concentrations are below the EQLs. Therefore, the lateral and vertical extent of Aroclor-1260 are defined.

Bis(2-ethylhexyl)phthalate and butylbenzylphthalate were each detected in one sample. Both concentrations are below the EQLs, and the concentration of butylbenzylphthalate decreases with depth. Therefore, the lateral and vertical extent of bis(2-ethylhexyl)phthalate and butylbenzylphthalate are defined.

Methylene chloride was detected in seven samples from four locations. At location 03-603862, the concentrations increase slightly (from 0.028 to 0.032 mg/kg) with depth but are low. All other sample concentrations are below the EQLs. The lateral and vertical extent of methylene chloride are defined.

Propylbenzene[1-] was detected in only one sample. The concentration is below the EQL and decreases with depth. Therefore, the lateral and vertical extent of 1-propylbenzene are defined.

F-3.9.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs at SWMU 01-001(s) are plutonium-239/240 and tritium. Sample results are presented in Table 6.11-4 and Plate 6.11-4.

Plutonium-239/240 was detected in three samples at three locations. It decreases with depth at two locations, but was detected only in the deeper sample at location 03-603865. Therefore, the vertical extent of plutonium-239/240 is not defined.

Tritium was detected in three samples at three locations. It decreases with depth at two locations, but was detected only in the deeper sample at location 03-603860. Therefore, the vertical extent of tritium is not defined.

F-3.9.5.4 Summary of Nature and Extent at SWMU 01-001(s)

The lateral and vertical extent of barium, copper, lead, and nickel are not defined at SWMU 01-001(s).

The lateral and vertical extent of all organic COPCs are defined.

The vertical extent of plutonium-239/240 and tritium is not defined.

F-3.10 SWMU 01-001(t)

Twenty samples (all tuff) were collected during the 2008–2009 investigation from 10 locations at SWMU 01-001(t). Table 6.12-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.12-1 is the site map showing sampling locations.

F-3.10.1 Inorganic Chemicals at SWMU 01-001(t)

All 20 samples collected at SWMU 01-001(t) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.12-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.12-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.12-2.

F-3.10.1.1 Inorganic Chemicals in Tuff

Twenty tuff samples from SWMU 01-001(t) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Aluminum was detected above the BV (7340 mg/kg)and above the maximum background concentration of aluminum in tuff (8370 mg/kg) in 1 of 20 tuff samples, at a concentration of 9730 mg/kg. Statistical tests were performed to determine if the site sample results for aluminum are different than background. The statistical test results are presented in Table F-3.10-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for aluminum in tuff is presented in Figure F-3.10-1. Aluminum is not identified as a COPC in tuff.

Antimony was not detected, but had a DL (0.57 mg/kg) above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in 1 of 20 tuff samples. The DL is less than 20% above the BV. Because antimony only has a DL that is slightly and infrequently above background (1 of 20 samples), it is not identified as a COPC in tuff.

Arsenic was detected above the BV (2.79 mg/kg) in 2 of 20 tuff samples. Both sample concentrations are 2.9 mg/kg, which is below the maximum background concentration of arsenic in tuff (5 mg/kg). Statistical tests were performed to determine if the site sample results for arsenic are different than background. The statistical test results are presented in Table F-3.10-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for arsenic in tuff is presented in Figure F-3.10-2. Arsenic is identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) in 5 of 20 tuff samples, with a maximum concentration of 106 mg/kg. Four of the five results also exceeded the maximum background concentration of barium in tuff (51.6 mg/kg). Statistical tests were performed to determine if the site sample results for barium are different than background. The statistical test results are presented in Table F-3.10-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for barium in tuff is presented in Figure F-3.10-3. Barium is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum background concentration of calcium in tuff (2230 mg/kg) in 1 of 20 tuff samples, at a concentration of 3000 mg/kg. Statistical tests were performed to determine if the site sample results for calcium are different than background. The statistical test results are presented in Table F-3.10-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for calcium in tuff is presented in Figure F-3.10-4. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 9 of 16 tuff samples, with a maximum concentration of 40.1 mg/kg. Six of the nine results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). Statistical tests were performed to determine if the site sample results for chromium are different than background. The statistical test results are presented in Table F-3.10-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for chromium in tuff is presented in Figure F-3.10-5. Chromium is identified as a COPC in tuff.

Cobalt was detected above the BV (3.14 mg/kg) and above the maximum background concentration of cobalt in tuff (also 3.14 mg/kg) in 1 of 20 tuff samples, at a concentration of 3.4 mg/kg. Statistical tests were performed to determine if the site sample results for cobalt are different than background. The statistical test results are presented in Table F-3.10-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for cobalt in tuff is presented in Figure F-3.10-6. Cobalt is not identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 5 of 20 tuff samples, with a maximum concentration of 159 mg/kg. Two of the five results also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). Statistical tests were performed to determine if the site sample results for copper are different than background. The statistical test results are presented in Table F-3.10-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for copper in tuff is presented in Figure F-3.10-7. Copper is identified as a COPC in tuff.

Total cyanide was not detected, but had DLs (0.55–0.62 mg/kg) above the BV (0.5 mg/kg) in 13 of 20 tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 6 of 20 tuff samples, with a maximum concentration of 50.5 mg/kg. Three of the six results also exceeded the maximum background concentration of lead in tuff (15.5 mg/kg). Statistical tests were performed to determine if the site sample results for lead are different than background. The statistical test results are presented in Table F-3.10-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for lead in tuff is presented in Figure F-3.10-8. Lead is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in 9 of 20 tuff samples, with a maximum concentration of 19 mg/kg. Seven of the nine results also exceeded the maximum background concentration of nickel in tuff (7 mg/kg). Statistical tests were performed to determine if the site sample results for nickel are different than background. The statistical test results are presented in Table F-3.10-1. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for nickel in tuff is presented in Figure F-3.10-9. Nickel is identified as a COPC in tuff.

Nitrate was detected in 3 of 20 tuff samples and has no BV in tuff. Nitrate is identified as a COPC in tuff.

Selenium was detected above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in 2 of 20 tuff samples, with concentrations of 0.36 and 0.32 mg/kg. Selenium also had DLs (0.57–0.61 mg/kg) above the BV in 13 of 20 tuff samples. Statistical tests were not performed because the background data of selenium in Qbt 2,3,4 tuff are all nondetects. The box plot for selenium in tuff is presented in Figure F-3.10-10. Selenium is identified as a COPC in tuff.

F-3.10.2 Organic Chemicals at SWMU 01-001(t)

Twenty tuff samples from SWMU 01-001(t) were analyzed for PCBs, SVOCs, and VOCs. Table 6.12-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.12-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.12-3.

F-3.10.2.1 Organic Chemicals in Tuff

Twenty tuff samples from SWMU 01-001(t) were analyzed for PCBs, SVOCs, and VOCs.

Acetone, benzyl alcohol, butylbenzylphthalate, and methylene chloride were detected in one or more tuff samples and are identified as COPCs in tuff.

F-3.10.3 Radionuclides at SWMU 01-001(t)

All 20 samples collected at SWMU 01-001(t) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.12-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.12-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 6.12-4.

F-3.10.3.1 Radionuclides in Tuff

Twenty tuff samples from SWMU 01-001(t) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in 3 of 20 tuff samples, with a maximum concentration of 0.197 pCi/g. Results were compared only to the BV because background dataset for uranium-235/236 in tuff is not available. Uranium-235/236 is identified as a COPC in tuff.

F-3.10.4 Summary of COPCs at SWMU 01-001(t)

The inorganic chemicals identified as COPCs at SWMU 01-001(t) are arsenic, barium, chromium, copper, total cyanide, lead, nickel, nitrate, and selenium.

The organic chemicals identified as COPCs at SWMU 01-001(t) are acetone, benzyl alcohol, butylbenzylphthalate, and methylene chloride.

The only radionuclide identified as a COPC at SWMU 01-001(t) is uranium-235/236.

F-3.10.5 Nature and Extent of Contamination at SWMU 01-001(t)

F-3.10.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 01-001(t) are arsenic, barium, chromium, copper, total cyanide, lead, nickel, nitrate, and selenium. Sample results are presented in Table 6.12-2 and Figure 6.12-2.

Arsenic was detected above the BV in the deepest samples at two locations with both concentrations being 2.9 mg/kg. The concentrations are less than 5% above the BV. Arsenic was not detected above the BV in samples from similar depths at other locations. Therefore, the lateral and vertical extent of arsenic are defined.

Concentrations of barium increase with depth at locations 00-603874, 00-603877, 00-603878, and 00-603881. However, all concentrations are less than or approximately twice the maximum tuff background concentration (51.6 mg/kg). Therefore, the lateral and vertical extent of barium are defined.

Concentrations of chromium increase with depth or remain essentially the same with depth at locations 00-603874, 00-603876, 00-603877, 00-603879, and 00-603881. However, all concentrations are less than or approximately 3 times the maximum tuff background concentration (13 mg/kg). Therefore, the lateral and vertical extent of chromium are defined.

Concentrations of copper increase with depth at locations at locations 00-603873 and 00-603878. However, all concentrations are less than or approximately twice the maximum tuff background concentration (6.2 mg/kg), except a concentration of 159 mg/kg that was detected at location 00-603881 and decreases with depth. Therefore, the lateral and vertical extent of copper are defined.

Cyanide was not detected at the site. Therefore, the lateral and vertical extent of cyanide are defined.

Concentrations of lead increase with depth at locations 00-603878 and 00-603881. However, all concentrations are less than or approximately 3 times the maximum tuff background concentration (15.5 mg/kg). Therefore, the lateral and vertical extent of lead are defined.

Concentrations of nickel increase with depth or remain essentially the same with depth at locations 00-603876, 00-603877, 00-603879, 00-603880, and 00-603881. However, all concentrations are less than 3 times the maximum tuff background concentration (7 mg/kg). Therefore, the lateral and vertical extent of nickel are defined.

Nitrate was detected in three samples with concentrations of 0.55–3.1 mg/kg. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent of nitrate are defined.

Selenium was detected above the BV in the deepest samples at two locations with concentrations of 0.32 and 0.36 mg/kg. These concentrations are less than or equal to 20% above the BV and are less than the detection limits of the shallower depth samples at each location. Therefore, the lateral and vertical extent of selenium are defined.

F-3.10.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 01-001(t) are acetone, benzyl alcohol, butylbenzylphthalate, and methylene chloride. Sample results are presented in Table 6.12-3 and are shown in Figure 6.12-3.

Acetone was detected at concentrations near or below EQLs. Therefore, the lateral and vertical extent of acetone are defined.

Benzyl alcohol was detected only once at 1.8 mg/kg from 6-7 ft at location 00-603876. This is the only detection at the site, and it was not detected in deeper samples at other locations. The lateral and vertical extent of benzyl alcohol are defined.

Butylbenzylphthalate was detected only once at 0.04 mg/kg and the concentration decreases with depth. Therefore, the lateral and vertical extent of butylbenzylphthalate are defined.

Concentrations of methylene chloride decrease with depth or remain essentially the same. All concentrations are low. Therefore, the lateral and vertical extent of methylene chloride are defined.

F-3.10.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPC identified at SWMU 01-001(t) is uranium-235/236. Sample results are presented in Table 6.12-4 and are shown in Figure 6.12-4.

Uranium-235/236 was detected above BV at concentrations less than or slightly above twice the BV. Therefore, the lateral and vertical extent of uranium-235/236 are defined.

F-3.10.5.4 Summary of Nature and Extent at SWMU 01-001(t)

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined at SWMU 01-001(t).

F-3.11 SWMU 01-001(u)

Four samples (all tuff) were collected during the 2008–2009 investigation from two locations at SWMU 01-001(u). Table 6.13-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.13-1 is the site map showing sampling locations.

F-3.11.1 Inorganic Chemicals at SWMU 01-001(u)

All four samples collected at SWMU 01-001(u) were analyzed for analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.13-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.13-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.13-2.

F-3.11.1.1 Inorganic Chemicals in Tuff

Four tuff samples from SWMU 01-001(u) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Antimony was not detected, but had a DL (0.51 mg/kg) above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in one of four tuff samples. The DL is essentially the same as the BV. Antimony is not identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) and above the maximum background concentration of barium in tuff (51.6 mg/kg) in two of four tuff samples, with concentrations of 105 and 52.4 mg/kg. The box plot for barium in tuff is presented in Figure F-3.11-1. Barium is identified as a COPC in tuff.

Calcium was detected above BV (2200 mg/kg) and above the maximum background concentration of calcium in tuff (2230 mg/kg) in one of four tuff samples, at a concentration of 2370 mg/kg. The box plot for calcium in tuff is presented in Figure F-3.11-2. Calcium is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in one of four tuff samples, at a concentration of 7.7 mg/kg. The sample concentration is below the maximum background concentration of chromium in tuff (13 mg/kg). The box plot for chromium in tuff is presented in Figure F-3.11-3. Chromium is not identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in two of four tuff samples, with concentrations of 8.1 and 5.1 mg/kg. One sample result also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). The box plot for copper in tuff is presented in Figure F-3.11-4. Copper is identified as a COPC in tuff.

Total cyanide was not detected, but had DLs (0.6 and 0.51 mg/kg) above the BV (0.5 mg/kg) in two of four tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in all four tuff samples, with a maximum concentration of 28.2 mg/kg. Two of the four results also exceeded the maximum background concentration of lead in tuff (15.5 mg/kg). The box plot for lead in tuff is presented in Figure F-3.11-5. Lead is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in one of four tuff samples, at a concentration of 6.8 mg/kg. The sample result did not exceed the maximum background concentration of nickel in tuff (7 mg/kg). The box plot for nickel in tuff is presented in Figure F-3.11-6. Nickel is not identified as a COPC in tuff.

Selenium was not detected above the BV (0.3 mg/kg), but had DLs (0.6 and 0.61 mg/kg) above the BV and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in two of four tuff samples. Selenium is identified as a COPC in tuff.

Silver was detected above the BV (1 mg/kg) in one of four tuff samples, at a concentration of 1.9 mg/kg. The sample concentration is equal to the maximum background concentration of silver in tuff (1.9 mg/kg). The box plot for silver in tuff is presented in Figure F-3.11-7. Silver is not identified as a COPC in tuff.

F-3.11.2 Organic Chemicals at SWMU 01-001(u)

All four samples collected at SWMU 01-001(u) were analyzed for analyzed PCBs, SVOCs, and VOCs. Table 6.13-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.13-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.13-3.

F-3.11.2.1 Organic Chemicals in Tuff

Four tuff samples from SWMU 01-001(u) were analyzed for analyzed PCBs, SVOCs, and VOCs.

Acetone, bis(2-ethylhexyl)phthalate, fluoranthene, 4-isopropyltoluene, methylene chloride, pyrene, toluene, and trichlorofluoromethane were detected in one or more tuff samples and are identified as COPCs in tuff.

F-3.11.3 Radionuclides at SWMU 01-001(u)

All four samples collected at SWMU 01-001(u) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.13-1 summarizes the samples collected and the requested analyses for each sample.

F-3.11.3.1 Radionuclides in Tuff

Four tuff samples were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

No radionuclides were detected or detected above BVs in the tuff samples from SWMU 01-001(u).

F-3.11.4 Summary of COPCs at SWMU 01-001(u)

The inorganic chemicals identified as COPCs at SWMU 01-001(u) are barium, calcium, copper, total cyanide, lead, and selenium.

The organic chemicals identified as COPCs at SWMU 01-001(u) are acetone, bis(2-ethylhexyl)phthalate, fluoranthene, 4-isopropyltoluene, methylene chloride, pyrene, toluene, and trichlorofluoromethane.

No radionuclides are identified as COPCs at SWMU 01-001(u).

F-3.11.5 Nature and Extent of Contamination at SWMU 01-001(u)

F-3.11.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 01-001(u) are barium, calcium, copper, total cyanide, lead, and selenium. Sample results are presented in Table 6.13-2 and are shown in Figure 6.13-2.

Concentrations of barium and copper decrease with depth at both locations. Therefore, the lateral and vertical extent of barium and copper are defined.

Calcium was detected above the BV at one location and concentrations decreased with depth. Calcium was not detected above the BV at the other location. Therefore, the lateral and vertical extent of calcium are defined.

The concentration of lead increases with depth at both locations, but the concentrations are less than twice the maximum background concentration. Therefore, the lateral and vertical extent of lead are defined.

Cyanide and selenium were not detected at the site. Therefore, the lateral and vertical extent of cyanide and selenium are defined.

F-3.11.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 01-001(u) are acetone, bis(2-ethylhexyl)phthalate, fluoranthene, 4-isopropyltoluene, methylene chloride, pyrene, toluene, and trichlorofluoromethane. Sample results are presented in Table 6.13-3 and are shown in Figure 6.13-3.

Concentrations of all organic COPCs decrease with depth, except for acetone and bis(2-ethylhexyl)phthalate at location 00-603882. Concentrations of acetone and bis(2-ethylhexyl)phthalate are at or below EQLs. Therefore, the lateral and vertical extent of these organic COPCs are defined.

F-3.11.5.3 Summary of Nature and Extent at SWMU 01-001(u)

The lateral and vertical extent of all inorganic and organic COPCs are defined at SWMU 01-001(u).

F-3.12 SWMU 01-002

A total of 42 samples (2 fill and 40 tuff) were collected in 1994 and during the 2008–2009 investigation from 22 locations at SWMU 01-002. Table 6.14-1 summarizes the samples collected and the requested analyses for each sample. Plate 6.14-1 is the site map showing sampling locations.

F-3.12.1 Inorganic Chemicals at SWMU 01-002

All 42 samples collected at SWMU 01-002 were analyzed for TAL metals. Forty samples were also analyzed for nitrate, perchlorate, and cyanide (total). Table 6.14-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.14-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown on Plate 6.14-2.

F-3.12.1.1 Inorganic Chemicals in Soil

Two fill samples were collected at SWMU 01-002 and analyzed for TAL metals.

Antimony was not detected, but had DLs (4.3 and 4.2 mg/kg) above the BV (0.83 mg/kg) and above the maximum background concentration of antimony in soil (1 mg/kg) in both fill samples. Antimony is identified as a COPC in soil.

Cadmium was not detected, but had DLs (0.62 and 0.46 mg/kg) above the BV (0.4 mg/kg) in both fill samples. Both DLs are below the maximum background concentration of cadmium in soil (2.6 mg/kg). Cadmium is not identified as a COPC in soil.

Calcium was detected above the BV (6120 mg/kg) and above the maximum background concentration of calcium in soil (14000 mg/kg) in one of two fill samples, at a concentration of -49,500 mg/kg-. The box plot for calcium in soil is presented in Figure F-3.12-1. Calcium is identified as a COPC in soil.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in soil (also 0.1 mg/kg) in one of two fill samples, at a concentration of 0.53 mg/kg. Mercury also had a DL (0.12 mg/kg) above the BV in the other fill sample. Mercury is identified as a COPC in soil.

F-3.12.1.2 Inorganic Chemicals in Tuff

Forty tuff samples were collected at SWMU 01-002 and analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Aluminum was detected above the BV (7340 mg/kg) in 3 of 40 tuff samples, with a maximum concentration of 13200 mg/kg. Two of the three results also exceeded the maximum background concentration of aluminum in tuff (8370 mg/kg). Statistical tests were performed to determine if the site sample results for aluminum are different than background. The statistical test results are presented in Table F-3.12-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for aluminum in tuff is presented in Figure F-3.12-2. Aluminum is not identified as a COPC in tuff.

Antimony was not detected above the BV (0.5 mg/kg), but had DLs (0.53–0.63 mg/kg) above the BV and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in 5 of 40 tuff samples. Antimony is identified as a COPC in tuff.

Arsenic was detected above the BV (2.79 mg/kg) in 1 of 40 tuff samples, at a concentration of 3.7 mg/kg. The sample result did not exceed the maximum background concentration of arsenic in tuff (5 mg/kg). Statistical tests were performed to determine if the site sample results for arsenic are different than background. The statistical test results are presented in Table F-3.12-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for arsenic in tuff is presented in Figure F-3.12-3. Arsenic is not identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) in 7 of 40 tuff samples, with a maximum concentration of 201 mg/kg. Four of the seven results also exceeded the maximum background concentration of barium in tuff (51.6 mg/kg). Statistical tests were performed to determine if the site sample results for barium are different than background. The statistical test results are presented in Table F-3.12-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for barium in tuff is presented in Figure F-3.12-4. Barium is not identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in 1 of 40 tuff samples, at a concentration of 1.3 mg/kg. The sample result did not exceed the maximum background concentration of beryllium in tuff (1.8 mg/kg). Statistical tests were performed to determine if the site sample results for beryllium are different than background. The statistical test results are presented in Table F-3.12-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for beryllium in tuff is presented in Figure F-3.12-5. Beryllium is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum background concentration of calcium in tuff (2230 mg/kg) in 4 of 40 tuff samples, with a maximum concentration of 6290 mg/kg. Statistical tests were performed to determine if the site sample results for calcium are different than background. The statistical test results are presented in Table F-3.12-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for calcium in tuff is presented in Figure F-3.12-6. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 24 of 40 tuff samples, with a maximum concentration of 59.4 mg/kg. Thirteen of the 24 results also exceeded the maximum tuff background concentration (13 mg/kg). Statistical tests were performed to determine if the site sample results for chromium are different than background. The statistical test results are presented in Table F-3.12-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for chromium in tuff is presented in Figure F-3.12-7. Chromium is identified as a COPC in tuff.

Cobalt was detected above the BV (3.14 mg/kg) and above the maximum background concentration of cobalt in tuff (also 3.14 mg/kg) in only 1 of 40 tuff samples, at a concentration of 3.2 mg/kg. Statistical tests were performed to determine if the site sample results for cobalt are different than background. The statistical test results are presented in Table F-3.12-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for cobalt in tuff is presented in Figure F-3.12-8. Cobalt is not identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 3 of 40 tuff samples, with a maximum concentration of 6.4 mg/kg. One of the three results also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). Statistical tests were performed to determine if the site sample results for copper are different than background. The statistical test results are presented in Table F-3.12-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for copper in tuff is presented in Figure F-3.12-9. Copper is identified as a COPC in tuff.

Total cyanide was detected above the BV (0.5 mg/kg) in 2 of 40 tuff samples, with concentrations of 0.51 and 0.83 mg/kg. Total cyanide also had DLs (0.51–0.62 mg/kg) above the BV in 19 of 40 tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 12 of 40 tuff samples, with a maximum concentration of 74.2 mg/kg. Six of the 12 results also exceeded the maximum background concentration of lead in tuff (15.5 mg/kg). Statistical tests were performed to determine if the site sample results for lead are different than background. The statistical test results are presented in Table F-3.12-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for lead in tuff is presented in Figure F-3.12-10. Lead is identified as a COPC in tuff.

Magnesium was detected above the BV (1690 mg/kg) in 2 of 40 tuff samples, with sample concentrations of 2010 and 2350 mg/kg. Neither result exceeded the maximum background concentration of magnesium in tuff (2820 mg/kg). Statistical tests were performed to determine if the site sample results for magnesium are different than background. The statistical test results are presented in Table F-3.12-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for magnesium in tuff is presented in Figure F-3.12-11. Magnesium is not identified as a COPC in tuff.

Mercury was detected above the BV (0.1 mg/kg) in 1 of 40 tuff samples, at a concentration of 0.101 mg/kg. The sample result is essentially equal to the BV. Results were compared only to the BV

because a background dataset for mercury in tuff is not available. Because mercury was detected slightly and infrequently (1 of 40 samples) above the background, it is not identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in 17 of 40 tuff samples, with a maximum concentration of 27.4 mg/kg. Fourteen of the 17 results also exceeded the maximum background concentration of nickel in tuff (7 mg/kg). Statistical tests were performed to determine if the site sample results for nickel are different than background. The statistical test results are presented in Table F-3.12-1. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for nickel in tuff is presented in Figure F-3.12-12. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in one or more tuff samples and have no tuff BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was detected above the BV (0.3 mg/kg) in 13 of 40 tuff samples, with a maximum concentration of 0.43 mg/kg. Selenium also had DLs (0.56–0.61 mg/kg) above the BV in 10 tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). Statistical tests were not performed because the background data of selenium in Qbt 2,3,4 tuff are all nondetects. The box plot for selenium in tuff is presented in Figure F-3.12-13. Selenium is identified as a COPC in tuff.

F-3.12.2 Organic Chemicals at SWMU 01-002

Forty of the 42 samples collected at SWMU 01-002 were analyzed for PCBs, SVOCs, and VOCs. Table 6.14-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.14-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 6.14-3.

F-3.12.2.1 Organic Chemicals in Tuff

Forty tuff samples from SWMU 01-002 were analyzed for PCBs, SVOCs, and VOCs.

Acetone, Aroclor-1254, Aroclor-1260, benzene, bis(2-ethylhexyl)phthalate, n-butylbenzene, sec-butylbenzene, tert-butylbenzene, chloroform, isopropylbenzene, 4-isopropyltoluene, methylene chloride, styrene, toluene, trichlorofluoromethane, vinyl chloride, and xylene (total) were detected in one or more tuff sample and are identified as COPCs in tuff.

F-3.12.3 Radionuclides at SWMU 01-002

Forty of 42 samples collected at SWMU 01-002 were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.14-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.14-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown on Plate 6.14-4.

F-3.12.3.1 Radionuclides in Tuff

Forty tuff samples from SWMU 01-002 were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-238 was detected in 2 of 40 tuff samples with concentrations of 0.117 and 0.112 pCi/g, and has no tuff FV. Plutonium-238 is identified as a COPC in tuff.

Plutonium-239/240 was detected in 10 of 40 tuff samples with a maximum concentration of 29.5 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

Tritium was detected in 2 of 14 tuff samples with concentrations of 0.66 and 0.92 pCi/g, and has no tuff FV. Tritium is identified as a COPC in tuff.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in 3 of 40 tuff samples, with a maximum concentration of 0.231 pCi/g. Results were compared only to the BV because background dataset for uranium-235/236 in tuff is not available. Uranium-235/236 is identified as a COPC in tuff.

F-3.12.4 Summary of COPCs at SWMU 01-002

The inorganic chemicals identified as COPCs at SWMU 01-002 are antimony, beryllium, calcium, chromium, copper, total cyanide, lead, mercury, nickel, nitrate, perchlorate, and selenium.

The organic chemicals identified as COPCs at SWMU 01-002 are acetone, Aroclor-1254, Aroclor-1260, benzene, bis(2-ethylhexyl)phthalate, n-butylbenzene, sec-butylbenzene, tert-butylbenzene, chloroform, isopropylbenzene, 4-isopropyltoluene, methylene chloride, styrene, toluene, trichlorofluoromethane, vinyl chloride, and xylene (total).

The radionuclides identified as COPCs at SWMU 01-002 are plutonium-238, plutonium-239/240, tritium, and uranium-235/236.

F-3.12.5 Nature and Extent of Contamination at SWMU 01-002

F-3.12.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs at SWMU 01-002 are antimony, beryllium, calcium, chromium, copper, total cyanide, lead, mercury, nickel, nitrate, perchlorate, and selenium. Sample results for the inorganic COPCs identified at SWMU 01-002 are presented in Table 6.14-2 and are shown on Plate 6.14-2.

Antimony was not detected in any samples from SWMU 01-002. Therefore, the lateral and vertical extent of antimony are defined.

Beryllium was detected above BV only in one sample, and the concentration decreases with depth. Therefore, the lateral and vertical extent of beryllium are defined.

Calcium was detected above its BV in five samples at four locations. All sample concentrations were consistent with natural concentrations of calcium, except the fill sample at location 01-04226 (49,500 mg/kg). This unusually high concentration is not representative of calcium concentrations at this site and may be native to the fill material. Therefore, the lateral and vertical extent of calcium are defined.

Chromium was detected above its BV in 23 samples from 16 locations. Eleven of the 23 sample concentrations are less than the maximum background concentration. All but three of the sample concentrations are less than twice the maximum background concentration. The highest concentration of chromium (59.4 mg/kg) is in the shallower sample at location 00-603885, where the sample concentration decreases with depth. Chromium concentrations decrease laterally in both directions from location 00-603885. The lateral and vertical extent of chromium are defined.

Copper was detected above the BV at three locations. Copper concentrations decrease with depth and all are less than twice the BV. Therefore, the lateral and vertical extent of copper are defined.

Cyanide was detected above the BV at two locations. Cyanide was detected in the deepest sample at location 00-603892 at a concentration (0.51 mg/kg) that is essentially the BV. Cyanide was detected above the BV at location 00-604531 and the concentration decreased to below background with depth. The lateral and vertical extent of total cyanide are defined.

Lead was detected above its BV in 12 samples at nine locations. Lead concentrations decrease with depth at five of the nine locations. Two sample concentrations at two other locations are less than twice the maximum background concentration. The concentration in the upper sample at location 00-603895 is above twice the maximum background concentration, but decreases with depth. The lead concentrations increase with depth at location 00-603889, where the maximum lead concentration (74.2 mg/kg) was detected in the deeper sample. At the nearest location to 00-603889 (location 00-603890), lead was not detected above its BV in either sample, indicating the maximum detection at location 00-603889 is an isolated instance. Therefore, the lateral and vertical extent of lead are defined.

Mercury was detected above its BV in one sample at two locations. One sample concentration (0.101 mg/kg) is only slightly above the BV. The other detected concentration (0.53 mg/kg) is from a fill sample collected in 1994. Mercury was detected above its BV in only 2 of 42 samples at the site. Therefore, the lateral and vertical extent of mercury are defined.

Nickel was detected above its BV in 17 samples from 13 locations. All but two sample concentrations are less than twice the maximum background concentration. The two samples that exceed twice the maximum background concentration are from location 00-603885, where the concentrations decrease with depth. Therefore, the lateral and vertical extent of nickel are defined.

Nitrate was detected in 18 samples from 11 locations. Most sample concentrations are likely naturally occurring. Nitrate increases from 29.5 mg/kg to 44.3 mg/kg at location 00-603531. At nearby location 00-603894, samples from greater depths (11–12 ft bgs and 13–14 ft bgs) have nitrate at 0.51 mg/kg in only the deeper sample. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected in only one sample at location 00-603901. Perchlorate was not detected in the deeper sample at this location. Therefore, the lateral and vertical extent of perchlorate are defined.

Selenium was detected above its BV in 13 samples from 10 locations. All detected concentrations are less than twice the BV and do not change substantially with depth. Therefore, the lateral and vertical extent of selenium are defined.

F-3.12.5.2 Nature and Extent of Organic COPCs

The organic COPCs at SWMU 01-002 are acetone, Aroclor-1254, Aroclor-1260, benzene, bis(2-ethylhexyl)phthalate, n-butylbenzene, sec-butylbenzene, tert-butylbenzene, chloroform, isopropylbenzene, 4-isopropyltoluene, methylene chloride, styrene, toluene, trichlorofluoromethane, vinyl chloride, and xylene (total). Sample results for the organic COPCs identified at SWMU 01-002 are presented in Table 6.14-3 and are shown on Plate 6.14-3.

All VOCs, except methylene chloride, were detected in 5 or fewer of the 40 samples from SWMU 01-002. All VOC concentrations (including methylene chloride, detected in 9 of 40 samples) are very low and at or below the EQLs. Therefore, the lateral and vertical extent of all VOCs are defined.

Aroclor-1254 was detected in 3 of 40 samples at two locations. Concentrations decrease with depth at one location and increase from 0.063 to 0.21 mg/kg at the other location (00-604530). The lateral and vertical extent of Aroclor-1254 are defined.

Aroclor-1260 was detected in seven samples from four locations, decreasing with depth at three of those locations. At the fourth location (00-603892), Aroclor-1260 was detected only in the deeper sample, at an estimated concentration of 0.0073 mg/kg. All detected sample concentrations are very low and near the EQLs. Therefore, the lateral and vertical extent of Aroclor-1260 are defined.

Bis(2-ethylhexyl)phthalate was detected in only 3 of 40 samples. It was detected only in the deeper samples at three locations, but the sample concentrations are below the EQL. The infrequent detections and very low concentrations are not indicative of a release. Therefore, the lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

F-3.12.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs at SWMU 01-002 are plutonium-238, plutonium-239/240, tritium, and uranium-235/236. Sample results for the radionuclide COPCs identified at SWMU 01-002 are presented in Table 6.14-4 and are shown on Plate 6.14-4.

Plutonium-238 was detected in only 2 of 40 samples. It was detected in only the deeper sample at location 00-603899, and in only the upper sample at location 00-603900. These infrequent detections and low concentrations are not indicative of a release at the site. Therefore, the lateral and vertical extent of plutonium-238 are defined.

Plutonium-239/240 was detected in 10 of 40 samples from eight locations. Concentrations decrease with depth at six of the eight locations. The highest concentration of plutonium-239/240 is in the upper sample (11–12 ft bgs) at location 00-603894, but the concentration decrease with depth at that location. At location 00-604530, the concentration increase slightly with depth to 0.161 pCi/g in the deeper sample. At location 00-603899, plutonium-239/240 was detected only in the deeper sample (0.122 pCi/g, the lowest detected concentration at the site). The lateral and vertical extent of plutonium-239/240 are defined.

Tritium was detected in only 2 of 40 samples. Both detections are in the upper sample at their respective locations, and tritium was not detected in the deeper samples. Therefore, the lateral and vertical extent of tritium are defined.

Uranium-235/236 was detected above its BV in only 3 of 40 samples. It was not detected above its BV in the deeper sample at any locations. Therefore, the lateral and vertical extent of uranium-235/236 are defined.

F-3.12.5.4 Summary of Nature and Extent at SWMU 01-002

The lateral and vertical extent are defined for all inorganic COPCs.

The lateral and vertical extent are defined for all organic COPCs.

The lateral and vertical extent are defined for all radionuclide COPCs.

F-3.13 SWMU 01-003(a)

A total of 36 samples (7 soil and fill, 16 tuff, and 13 sediment) were collected during the 2008–2009 investigation from 18 locations at SWMU 01-003(a). Table 6.15-1 summarizes the samples collected and the requested analyses for each sample. Plate 6.15-1 is the site map showing sampling locations.

F-3.13.1 Inorganic Chemicals at SWMU 01-003(a)

All 36 samples collected at SWMU 01-003(a) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.15-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.15-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown on Plate 6.15-2.

F-3.13.1.1 Inorganic Chemicals in Soil

Seven soil and fill samples from SWMU 01-003(a) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Antimony was not detected, but had a DL (1.2 mg/kg) above the BV (0.83 mg/kg) and above the maximum background concentration of antimony in soil (1 mg/kg) in one of seven soil and fill samples. Antimony is identified as a COPC in soil.

Cadmium was detected above the BV (0.4 mg/kg) in one of seven soil and fill samples, at a concentration of 0.44 mg/kg. The sample result did not exceed the maximum background concentration of cadmium in soil (2.6 mg/kg). The box plot for cadmium in soil is presented in Figure F-3.13-1. Cadmium is not identified as a COPC in soil.

Calcium was detected above the BV (6120 mg/kg) in two of seven soil and fill samples, with concentrations of 6250 and 8130 mg/kg. Neither result exceeded the maximum background concentration of calcium in soil (14000 mg/kg). The box plot for calcium in soil is presented in Figure F-3.13-2. Calcium is not identified as a COPC in soil.

Chromium was detected above the BV (19.3 mg/kg) in one of seven soil and fill samples, at a concentration of 26.2 mg/kg. This result did not exceed the maximum background concentration of chromium in soil (36.5 mg/kg). The box plot for chromium in soil is presented in Figure F-3.13-3. Chromium is not identified as a COPC in soil.

Total cyanide was not detected above the BV (0.5 mg/kg), but had DLs (0.54 and 0.59 mg/kg) above the BV in two of seven soil and fill samples. Results were compared only to the BV because a background dataset for total cyanide in soil is not available. Total cyanide is identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) and above the maximum background concentration of lead in soil (28 mg/kg) in five of seven soil and fill samples, with a maximum concentration of 127 mg/kg. The box plot for lead in soil is presented in Figure F-3.13-4. Lead is identified as a COPC in soil.

Manganese was detected above the BV (671 mg/kg) in one of seven soil and fill samples, at a concentration of 798 mg/kg. The sample result did not exceed the maximum background concentration of manganese in soil (1100 mg/kg). The box plot for manganese in soil is presented in Figure F-3.13-5. Manganese is not identified as a COPC in soil.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in soil (also 0.1 mg/kg) in five of seven soil samples, with a maximum concentration of 0.42 mg/kg. The box plot for mercury in soil is presented in Figure F-3.13-6. Mercury is identified as a COPC in soil.

Nitrate and perchlorate were detected in one or more soil and fill samples and have no BVs. Nitrate and perchlorate are identified as COPCs in soil.

Zinc was detected above the BV (48.8 mg/kg) in four of seven soil and fill samples, with a maximum concentration of 78.8 mg/kg. One of the four results also exceeded the maximum background concentration for zinc in soil (75.5 mg/kg). The box plot for zinc in soil is presented in Figure F-3.13-7. Zinc is identified as a COPC in soil.

F-3.13.1.2 Inorganic Chemicals in Tuff

Sixteen tuff (11 Qbt 3 and 5 Qbt 1g) samples from SWMU 01-003(a) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Aluminum was detected above the BV (7340 mg/kg) and above the maximum background concentration of aluminum in tuff (8370 mg/kg) in 1 of 11 Qbt 3 tuff samples, at a concentration of 8410 mg/kg. Statistical tests were performed to determine if the site sample results from Qbt 3 for aluminum are different than background. The statistical test results are presented in Table F-3.13-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for aluminum in Qbt 3 tuff is presented in Figure F-3.13-8. Aluminum is not identified as a COPC in tuff.

Antimony was not detected, but had a DL (0.64 mg/kg) above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in Qbt 3 tuff (0.4 mg/kg) in 1 of 11 Qbt 3 tuff samples. Antimony is identified as a COPC in tuff.

Arsenic was detected above the respective BV (2.79 mg/kg for Qbt 3 and 0.56 mg/kg for Qbt 1g) in 1 of 11 Qbt 3 and 4 of 5 Qbt 1g tuff samples, with a maximum concentration of 2.8 mg/kg. Arsenic also had a DL (0.95 mg/kg) above the Qbt 1g BV. The sample result in Qbt 3 tuff (2.8 mg/kg) did not exceed the respective maximum background concentration of arsenic in Qbt 3 tuff (5 mg/kg). All sample results and the DL in Qbt 1g tuff exceeded the maximum background concentration of arsenic in Qbt 1g tuff (0.7 mg/kg). Statistical tests were performed to determine if the site sample results from Qbt 3 for arsenic are different than background. The statistical test results are presented in Table F-3.13-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plots for arsenic in Qbt 3 and Qbt 1g tuff are presented in Figures F-3.13-9 and F-3.13-10, respectively. Arsenic is identified as a COPC in tuff.

Barium was detected above the respective BV (46.0 mg/kg for Qbt 3 and 25.7 mg/kg for Qbt 1g) in 2 of 11 Qbt 3 and 4 of 5 Qbt 1g tuff samples, with a maximum concentration of 62.7 mg/kg. These sample results (two from Qbt 3 and four from Qbt 1g) also exceeded the respective maximum background concentration of barium in tuff (51.6 mg/kg for Qbt 3 and 23 mg/kg for Qbt 1g). Statistical tests were performed to determine if the site sample results from Qbt 3 for barium are different than background. The statistical test results are presented in Table F-3.13-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plots for barium in Qbt 3 and Qbt 1g tuff are presented in Figures F-3.13-11 and F-3.13-12, respectively. Barium is identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in 2 of 11 Qbt 3 tuff samples, with concentrations of 1.4 and 1.6 mg/kg. Neither result exceeded the maximum background concentration of beryllium in Qbt 3 tuff (1.8 mg/kg). Statistical tests were performed to determine if the site sample results from Qbt 3 for beryllium are different than background. The statistical test results are presented in Table F-3.13-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for beryllium in Qbt 3 tuff is presented in Figure F-3.13-13. Beryllium is not identified as a COPC in tuff.

Calcium was detected above the respective BV (2200 mg/kg for Qbt 3 and 1900 mg/kg for Qbt 1g) in 2 of 11 Qbt 3 and 2 of 5 Qbt 1g tuff samples, with a maximum concentration of 15100 mg/kg. The two results from Qbt 3 and one of the two results from Qbt 1g also exceeded the respective maximum background concentration of calcium in tuff (2230 mg/kg for Qbt 3 and 2300 mg/kg for Qbt 1g). Statistical tests were performed to determine if the site sample results from Qbt 3 for calcium are different than background. The statistical test results are presented in Table F-3.13-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plots for calcium in Qbt 3 and Qbt 1g tuff are presented in Figures F-3.13-14 and F-3.13-15, respectively. Calcium is identified as a COPC in tuff.

Chromium was detected above the respective BV (7.14 mg/kg for Qbt 3 and 2.6 mg/kg for Qbt 1g) in 10 of 11 Qbt 3 and all five Qbt 1g tuff samples, with a maximum concentration of 32.2 mg/kg. Six of the 10 results from Qbt 3 and all five results from Qbt 1g also exceeded the maximum background concentration of chromium in tuff (13 mg/kg for Qbt 3 and 2.3 mg/kg for Qbt 1g). Statistical tests were performed to determine if the site sample results from Qbt 3 for chromium are different than background. The statistical test results are presented in Table F-3.13-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plots for chromium in Qbt 3 and Qbt 1g tuff are presented in Figures F-3.13-16 and F-3.13-17, respectively. Chromium is identified as a COPC in tuff.

Copper was detected above the respective BV (4.66 mg/kg for Qbt 3 and 3.96 mg/kg for Qbt 1g) in 3 of 11 Qbt 3 and 3 of 5 Qbt 1g tuff samples, with a maximum concentration of 8.3 mg/kg. One of the three results from Qbt 3 and all three results from Qbt 1g also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg for Qbt 3 and 2.6 mg/kg for Qbt 1g). Statistical tests were performed to determine if the site sample results from Qbt 3 for copper are different than background. The statistical test results are presented in Table F-3.13-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plots for copper in Qbt 3 and Qbt 1g tuff are presented in Figures F-3.13-18 and F-3.13-19, respectively. Copper is identified as a COPC in tuff.

Total cyanide was not detected, but had DLs (0.52–0.58 mg/kg) above the respective BV (both 0.5 mg/kg for Qbt 3 and Qbt 1g) in 5 of 11 Qbt 3 and 4 of 5 Qbt 1g tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Iron was detected above the BV (3700 mg/kg) and above the maximum background concentration of iron in tuff (also 3700 mg/kg) in four of five Qbt 1g tuff samples, with a maximum concentration of 5130 mg/kg. The box plot for iron in Qbt 1g tuff is presented in Figure F-3.13-20. Iron is identified as a COPC in tuff.

Lead was detected above the respective BV (11.2 mg/kg for Qbt 3 and 13.5 mg/kg for Qbt 1g) in 4 of 11 Qbt 3 and 2 of 5 Qbt 1g tuff samples, with a maximum concentration of 19.9 mg/kg. One of the four results from Qbt 3 also exceeded the maximum background concentration of lead in Qbt 3 tuff (15.5 mg/kg). The two results from Qbt 1g did not exceed the maximum background concentration of lead in Qbt 1g tuff (20 mg/kg). Statistical tests were performed to determine if the site sample results from Qbt

3 for lead are different than background. The statistical test results are presented in Table F-3.13-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plots for lead in Qbt 3 and Qbt 1g tuff are presented in Figures F-3.13-21 and F-3.13-22, respectively. Lead is identified as a COPC in tuff.

Manganese was detected above the BV (482 mg/kg for Qbt 3 and 189 mg/kg for Qbt 1g) in 1 of 9 Qbt 3 and 4 of 5 Qbt 1g tuff samples, with a maximum concentration of 672 mg/kg. The sample result from Qbt 3 (672 mg/kg) did not exceed the maximum background concentration of manganese in Qbt 3 tuff (752 mg/kg). Three of the four results from Qbt 1g exceeded the maximum background concentration of manganese in Qbt 1g tuff (210 mg/kg). The box plots for manganese in Qbt 3 and Qbt 1g tuff are presented in Figures F-3.13-23 and F-3.13-24, respectively. Manganese is identified as a COPC in tuff.

Mercury was detected above the BV (0.1 mg/kg) in 2 of 11 Qbt 3 tuff samples, with concentrations of 0.119 and 0.13 mg/kg. Results were compared only to the BV because a background dataset for mercury in tuff is not available. Mercury is identified as a COPC in tuff.

Nickel was detected above the respective BV (6.58 mg/kg for Qbt 3 and 2 mg/kg for Qbt 1g) in 5 of 11 Qbt 3 and all five Qbt 1g tuff samples, with a maximum concentration of 12.6 mg/kg. All sample results also exceeded the respective maximum background concentration of nickel in tuff (7 mg/kg for Qbt 3 and 2.8 mg/kg for Qbt 1g). Statistical tests were performed to determine if the site sample results from Qbt 3 and Qbt 1g for nickel are different than background. The statistical test results are presented in Table F-3.13-1. The result of the quantile test indicates that the site sample results are statistically different than background. The box plots for nickel in Qbt 3 and Qbt 1g tuff are presented in Figures F-3.13-25 and F-3.13-26, respectively. Nickel is identified as a COPC in tuff.

Nitrate was detected in 10 of 16 tuff samples and has no BV. Nitrate is identified as a COPC in tuff.

Selenium was not detected above the respective BV (both 0.3 mg/kg in Qbt 3 and Qbt 1g), but had DLs (0.52–0.58 mg/kg) above the BV in 3 of 11 Qbt 3 and 4 of 5 Qbt 1g tuff samples. Results from Qbt 3 were compared only to the BV because the BV is greater than the maximum background concentration of selenium in Qbt 3 tuff (0.105 mg/kg). Statistical tests were not performed because the background data of selenium in Qbt 2,3,4 tuff are all nondetects. A background dataset for selenium in Qbt 1g is not available. Selenium is identified as a COPC in tuff.

Silver was detected above the BV (1 mg/kg) in 1 of 11 Qbt 3 tuff samples, at a concentration of 1.4 mg/kg. The sample result did not exceed the maximum background concentration of silver in tuff (1.9 mg/kg). Statistical tests were performed to determine if the site sample results from Qbt 3 for silver are different than background. The statistical test results are presented in Table F-3.13-1. The results of both the quantile test and the slippage test indicate that the site sample results are not statistically different than background. The box plot for silver in Qbt 3 tuff is presented in Figure F-3.13-27. Silver is not identified as a COPC in tuff.

Vanadium was detected above the BV (4.59 mg/kg) and above the maximum background concentration of vanadium in Qbt 1g tuff (3.8 mg/kg) in two of five Qbt 1g tuff samples, with concentrations at 5.5 and 5.4 mg/kg. The box plot for vanadium in Qbt 1g tuff is presented in Figure F-3.13-28. Vanadium is identified as a COPC in tuff.

Zinc was detected above the BV (40.0 mg/kg) in three of five Qbt 1g tuff samples, with a maximum concentration of 66.5 mg/kg. Two of the three results also exceeded the maximum background concentration of zinc in Qbt 1g tuff (46 mg/kg). The box plot for zinc in Qbt 1g tuff is presented in Figure F-3.13-29. Zinc is identified as a COPC in tuff.

F-3.13.1.3 Inorganic Chemicals in Sediment

Thirteen sediment samples from SWMU 01-003(a) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Beryllium was not detected above the BV (1.31 mg/kg), but had a DL (2.7 mg/kg) above the BV and the maximum background concentration of beryllium in sediment (1.3 mg/kg) in 1 of 13 sediment samples. Statistical tests were performed to determine if the site sample results for beryllium are different than background. The statistical test results are presented in Table F-3.13-2. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for beryllium in sediment is presented in Figure F-3.13-30. Beryllium is not identified as a COPC in sediment.

Calcium was detected above the BV (4420 mg/kg) and above the maximum background concentration of calcium in sediment (4240 mg/kg) in 1 of 13 sediment samples, at a concentration of 4650 mg/kg. Statistical tests were performed to determine if the site sample results for calcium are different than background. The statistical test results are presented in Table F-3.13-2. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for calcium in sediment is presented in Figure F-3.13-31. Calcium is not identified as a COPC in sediment.

Chromium was detected above the BV (10.5 mg/kg) and above the maximum background concentration of chromium in sediment (9.2 mg/kg) in 3 of 13 sediment samples, with a maximum sample concentration of 27.1 mg/kg. Statistical tests were performed to determine if the site sample results for chromium are different than background. The statistical test results are presented in Table F-3.13-2. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for chromium in sediment is presented in Figure F-3.13-32. Chromium is not identified as a COPC in sediment.

Total cyanide was not detected above the BV (0.82 mg/kg), but had a DL (1 mg/kg) above the BV and above the maximum background concentration of total cyanide in sediment (0.63 mg/kg) in 1 of 13 sediment samples. Statistical tests were performed to determine if the site sample results for total cyanide are different than background. The statistical test results are presented in Table F-3.13-2. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for total cyanide in sediment is presented in Figure F-3.13-33. Total cyanide is identified as a COPC in sediment.

Lead was detected above the BV (19.7 mg/kg) in 6 of 13 sediment samples, with a maximum concentration of 10400 mg/kg. Five of the six results also exceeded the maximum background concentration of lead in sediment (25.6 mg/kg). Lead is interpreted as being substantially different than background, and no further evaluation is necessary. Lead is identified as a COPC in sediment.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in sediment (0.03 mg/kg) in 5 of 13 sediment samples, with a maximum concentration of 0.43 mg/kg. Statistical tests were performed to determine if the site sample results for mercury are different than background. The statistical test results are presented in Table F-3.13-2. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for mercury in sediment is presented in Figure F-3.13-34. Mercury is identified as a COPC in sediment.

Nickel was detected above the BV (9.38 mg/kg) and above the maximum background concentration of nickel in sediment (8.9 mg/kg) in 1 of 13 sediment samples, at a concentration of 12.8 mg/kg. Statistical

tests were performed to determine if the site sample results for nickel are different than background. The statistical test results are presented in Table F-3.13-2. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for nickel in sediment is presented in Figure F-3.13-35. Nickel is not identified as a COPC in sediment.

Nitrate and perchlorate were detected in one or more sediment samples and have no BVs. Nitrate and perchlorate are identified as COPCs in sediment.

Selenium was not detected above the BV (0.3 mg/kg), but had DLs (0.52–0.57 mg/kg) above the BV and above the maximum background concentration of selenium in sediment (0.1 mg/kg) in 11 of 13 sediment samples. Statistical tests were not performed because the background data of selenium in sediment are all nondetects. The box plot for selenium in sediment is presented in Figure F-3.13-36. Selenium is identified as a COPC in sediment.

Zinc was detected above the BV (60.2 mg/kg) and above the maximum background concentration of zinc in sediment (56.2 mg/kg) in 2 of 13 sediment samples, with concentrations of 91.9 and 62.7 mg/kg. Statistical tests were performed to determine if the site sample results for zinc are different than background. The statistical test results are presented in Table F-3.13-2. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for zinc in sediment is presented in Figure F-3.13-37. Zinc is identified as a COPC in sediment.

F-3.13.2 Organic Chemicals at SWMU 01-003(a)

All 36 samples collected at SWMU 01-003(a) were analyzed for PCBs, SVOCs, and VOCs. Table 6.15-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.15-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 6.15-3.

F-3.13.2.1 Organic Chemicals in Soil

Seven soil and fill samples from SWMU 01-003(a) were analyzed for PCBs, SVOCs, and VOCs.

Acenaphthene, acetone, anthracene, Aroclor-1254, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene were detected in one or more soil and fill samples, and are identified as COPCs in soil and fill.

F-3.13.2.2 Organic Chemicals in Tuff

Sixteen tuff samples from SWMU 01-003(a) were analyzed for PCBs, SVOCs, and VOCs.

Acenaphthene, acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, di-n-butylphthalate, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 4-isopropyltoluene, phenanthrene, and pyrene were detected in one or more tuff samples, and are identified as COPCs in tuff.

F-3.13.2.3 Organic Chemicals in Sediment

Thirteen sediment samples from SWMU 01-003(a) were analyzed for PCBs, SVOCs, and VOCs.

Acenaphthene, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzoic acid, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, chrysene, dibenz(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, and pyrene were detected in one or more sediment samples, and are identified as COPCs in sediment.

F-3.13.3 Radionuclides at SWMU 01-003(a)

All 36 samples collected at SWMU 01-003(a) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.15-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.15-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown on Plate 6.15-4.

F-3.13.3.1 Radionuclides in Soil

Seven soil and fill samples from SWMU 01-003(a) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Cesium-134 was detected in one soil sample at a depth where the FV does not apply, at a concentration of 0.043 pCi/g. Cesium-134 is identified as a COPC in soil.

Cesium-137 was detected in one soil sample at a depth where the FV does not apply, at a concentration of 0.294 pCi/g. Cesium-137 is identified as a COPC in soil.

Plutonium-239/240 was detected in all seven soil and fill samples at depths where the FV does not apply, with a maximum concentration of 0.917 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

Uranium-234 was detected above the BV (2.59 pCi/g) in two of seven soil and fill samples, with concentrations of 4.42 and 2.78 pCi/g. Results were compared only to the BV because background dataset for uranium-234 in soil is not available. Uranium-234 is identified as a COPC in soil.

Uranium-235/236 was detected above the BV (0.2 pCi/g) in one of seven soil and fill samples, at a concentration of 0.307 pCi/g. Results were compared only to the BV because background dataset for uranium-235/236 in soil is not available. Uranium-235/236 is identified as a COPC in soil.

Uranium-238 was detected above the BV (2.29 pCi/g) in two of seven soil and fill samples, with concentrations of 3.68 and 2.59 pCi/g. Results were compared only to the BV because background dataset for uranium-238 in soil is not available. Uranium-238 is identified as a COPC in soil.

F-3.13.3.2 Radionuclides in Tuff

Sixteen tuff samples from SWMU 01-003(a) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected in 13 of 16 tuff samples with a maximum concentration of 2.76 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

Tritium was detected in 1 of 16 tuff samples at a concentration of 0.4 pCi/g, and has no tuff FV. Tritium is identified as a COPC in tuff.

Uranium-234 was detected above the BV (1.98 pCi/g) in 5 of 16 tuff samples, with a maximum concentration of 4.89 pCi/g. Results were compared only to the BV because background dataset for uranium-234 in tuff is not available. Uranium-234 is identified as a COPC in tuff.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in 3 of 16 tuff samples, with a maximum concentration of 0.163 pCi/g. Results were compared only to the BV because background dataset for uranium-235/236 in tuff is not available. Uranium-235/236 is identified as a COPC in tuff.

Uranium-238 was detected above the BV (1.93 pCi/g) in 3 of 16 tuff samples, with a maximum concentration of 2.96 pCi/g. Results were compared only to the BV because background dataset for uranium-238 in tuff is not available. Uranium-238 is identified as a COPC in tuff.

F-3.13.3.3 Radionuclides in Sediment

Thirteen sediment samples from SWMU 01-003(a) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) and above the maximum background concentration of plutonium-239/240 in sediment (0.065 pCi/g) in all 13 sediment samples, with a maximum concentration of 3.29 pCi/g. Statistical tests were performed to determine if the site sample results for plutonium-239/240 are different than background. The statistical test results are presented in Table F-3.13-3. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for plutonium-239/240 in sediment is presented in Figure F-3.13-38. Plutonium-239/240 is identified as a COPC in sediment.

Uranium-234 was detected above the BV (2.59 pCi/g) and above the maximum background concentration of uranium-234 in sediment (2.5 pCi/g) in 1 of 13 sediment samples, at a concentration of 3.05 pCi/g. Statistical tests were performed to determine if the site sample results for uranium-234 are different than background. The statistical test results are presented in Table F-3.13-3. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for uranium-234 in sediment is presented in Figure F-3.13-39. Uranium-234 is not identified as a COPC in sediment.

Uranium-238 was detected above the BV (2.29 pCi/g) and above the maximum background concentration of uranium-238 in sediment (2.1 pCi/g) in 1 of 13 sediment samples, at a concentration of 2.31 pCi/g. Statistical tests were performed to determine if the site sample results for uranium-238 are different than background. The statistical test results are presented in Table F-3.13-3. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for uranium-238 in sediment is presented in Figure F-3.13-40. Uranium-238 is not identified as a COPC in sediment.

F-3.13.4 Summary of COPCs at SWMU 01-003(a)

The inorganic chemicals identified as COPCs at SWMU 01-003(a) are antimony, arsenic, barium, calcium, chromium, copper, total cyanide, iron, lead, manganese, mercury, nickel, nitrate, perchlorate, selenium, vanadium, and zinc.

The organic chemicals identified as COPCs at SWMU 01-003(a) are acenaphthene, acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzoic acid, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, chrysene, di-n-butylphthalate, dibenz(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 4-isopropyltoluene, naphthalene, phenanthrene, and pyrene.

The radionuclides identified as COPCs at SWMU 01-003(a) are cesium-134, cesium-137, plutonium-239/240, tritium, uranium-234, uranium-235/236, and uranium-238.

F-3.13.5 Nature and Extent of Contamination at SWMU 01-003(a)

F-3.13.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs at SWMU 01-003(a) are antimony, arsenic, barium, calcium, chromium, copper, total cyanide, iron, lead, manganese, mercury, nickel, nitrate, perchlorate, selenium, vanadium, and zinc. Sample results for the inorganic COPCs identified at SWMU 01-003(a) are presented in Table 6.15-2 and are shown on Plate 6.15-2.

Antimony, cyanide, and selenium were not detected at the site. Therefore, the lateral and vertical extent of antimony, cyanide, and selenium are defined.

Arsenic, barium, chromium, copper, iron, lead, manganese, mercury, nickel, and zinc increase with depth and are above their BVs in the deepest samples at multiple locations. Therefore, the vertical extent of these COPCs is not defined. Arsenic, chromium, lead, manganese, and mercury had higher concentrations at the location farthest downslope than at some locations upslope. Therefore, the lateral extent of arsenic, chromium, lead, manganese, and mercury are not defined.

Calcium was detected at six locations and concentrations decreased with depth except at locations 00-603902 and 00-603913. Calcium concentrations at location 00-603902 are less than twice the BV. Calcium was either not detected above the BV or concentrations decreased with depth in samples from locations downslope from location 00-603913. Therefore, the lateral and vertical extent of calcium are defined.

Nitrate was detected in fill material at the two locations (00-603902 and 00-603918) on mesa top, with concentrations of 4.8–9.6 mg/kg. Nitrate concentrations decreased with depth along the canyon slope. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected at two locations and the concentrations decreased with depth at both locations. Perchlorate was not detected in samples from locations on the canyon slope. Therefore, the lateral and vertical extent of perchlorate are defined.

Vanadium was detected at two locations. The concentrations remained essentially the same at one location and decreased with depth at the other location. Vanadium was not detected above the BV at the farthest downslope location 00-603917. Therefore, the lateral and vertical extent of vanadium are defined.

F-3.13.5.2 Nature and Extent of Organic COPCs

The organic COPCs at SWMU 01-003(a) are acenaphthene, acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzoic acid, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, chrysene, di-n-butylphthalate, dibenz(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene,

4-isopropyltoluene, naphthalene, phenanthrene, and pyrene. Sample results for the organic COPCs identified at SWMU 01-003(a) are presented in Table 6.15-3 and are shown on Plate 6.15-3.

Aroclor-1254 was detected at all sampling locations. Most concentrations are low, but it was detected above 1 mg/kg at three locations in the upper part of the site (locations 00-603902, 00-603904, and 00-603919). The concentrations of Aroclor-1254 decrease with depth at all locations except 00-603918, where it increases from 0.042 mg/kg at the surface to 0.12 mg/kg in the deeper sample (3.5–4.25 ft bgs). Concentrations of Aroclor-1254 in general decreased from mesa top to the toe of the slope immediately above the flood zone in Los Alamos Canyon. Therefore, the lateral and vertical extent of Aroclor-1254 are defined to the toe of the slope in Los Alamos Canyon. Aroclor-1260 was only detected at three locations, at low concentrations of 0.11 mg/kg or less. Therefore, the lateral and vertical extent of Aroclor-1260 are defined,

PAHs were detected at all but one location. Concentrations of PAHs decrease with depth at all locations where they were detected. Therefore, the lateral and vertical extent of PAHs are defined.

Bis(2-ethylhexyl)phthalate was detected at four locations in the lower part of the drainage, but was not detected at the lowest location at the toe of the slope. Concentrations decrease with depth at three locations and are at the EQL. Therefore, the lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Butylbenzylphthalate was detected only once, and decreases with depth. Therefore, the lateral and vertical extent of butylbenzylphthalate are defined.

Di-n-butylphthalate was detected at only one location (00-603912). It was detected in the deeper sample at that location but the concentration (0.053 mg/kg) is below the EQL. Therefore, the lateral and vertical extent of di-n-butylphthalate are defined.

Dibenzofuran was detected at six locations in the lower part of the drainage, but was not detected at the lowest location on the toe of the slope (00-603917). Concentrations decrease with depth at all locations. Therefore, the lateral and vertical extent of dibenzofuran are defined.

Benzoic acid was detected only once, and decreases with depth. Therefore, the lateral and vertical extent of benzoic acid are defined.

Isopropyltoluene[4-] and naphthalene were detected in only one sample each, at concentrations near the EQLs. They were not detected in samples from downslope locations 00-603916 and 00-603917. Therefore, the lateral and vertical extent of 4-isopropyltoluene and naphthalene are defined.

F-3.13.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs at SWMU 01-003(a) are cesium-134, cesium-137, plutonium-239/240, tritium, uranium-234, uranium-235/236, and uranium-238. Sample results for the radionuclide COPCs identified at SWMU 01-003(a) are presented in Table 6.15-4 and are shown on Plate 6.15-4.

Cesium-134 and cesium-137 each were detected only once and decrease with depth. Therefore, the lateral and vertical extent of cesium-134 and cesium-137 are defined.

Plutonium-239/240 was detected in both samples at all sampling locations. Concentrations increase with depth at locations 00-603918, 00-603906, 00-603904, 00-603912, and 00-603913. The concentration in the surface sample at the toe of the slope (00-603917) is 2.26 pCi/g. Therefore, the lateral and vertical extent of plutonium-239/240 are not defined.

Tritium was detected only once, in the deeper sample at location 00-603908. Therefore, the nature and extent of tritium are defined.

Uranium-234 was detected above its BV at six locations. Concentrations increase with depth at five locations, but only one detected concentration is more than twice the BV. Uranium-235/236 was detected above its BV at four locations. It was detected above its BV only in the deeper samples at three locations. All concentrations of uranium-235/236 are less than twice the Qbt 3 BV. Uranium-238 was detected above its BV at four locations, and either increase with depth or are above its BV only in the deeper sample at three locations. None of the detected concentrations of uranium-238 are more than twice the BV. None of the uranium isotopes were detected above background at the five locations farthest downslope. Therefore, the lateral and vertical extent of the uranium isotopes are defined.

F-3.13.5.4 Summary of Nature and Extent at SWMU 01-003(a)

The lateral and vertical extent are not defined for several inorganic COPCs.

The lateral and vertical extent of all organic COPCs are defined.

The lateral and vertical extent are defined for all radionuclide COPCs except plutonium-239/240.

F-3.14 SWMU 01-003(b)

A total of 10 samples (1 fill, 5 tuff, and 4 sediment) were collected during the 2008–2009 investigation from five locations at SWMU 01-003(b). Table 6.16-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.16-1 is the site map showing sampling locations.

F-3.14.1 Inorganic Chemicals at SWMU 01-003(b)

All 10 samples collected at SWMU 01-003(b) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.16-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.16-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.16-2.

F-3.14.1.1 Inorganic Chemicals in Soil

One fill sample from SWMU 01-003(b) was analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Lead was detected above the BV (22.3 mg/kg) and above the maximum background concentration of lead in soil (28 mg/kg) in the fill sample. The box plot for lead in soil is presented in Figure F-3.14-1. Lead is identified as a COPC in soil.

Nitrate and perchlorate were detected and have no BVs. Nitrate and perchlorate are identified as COPCs in soil.

F-3.14.1.2 Inorganic Chemicals in Tuff

Five tuff samples from SWMU 01-003(b) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Aluminum was detected above the BV (7340 mg/kg) and above the maximum background concentration of aluminum in tuff (8370 mg/kg) in one of five tuff samples, at a concentration of 10700 mg/kg. The box plot for aluminum in tuff is presented in Figure F-3.14-2. Aluminum is identified as a COPC in tuff.

Antimony was not detected, but had a DL (0.75 mg/kg) above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in one of five tuff samples. Antimony is identified as a COPC in tuff.

Arsenic was detected above the BV (2.79 mg/kg) and above the maximum background concentration of arsenic in tuff (5 mg/kg) in one of five tuff samples, at a concentration of 35.9 mg/kg. The box plot for arsenic in tuff is presented in Figure F-3.14-3. Arsenic is identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) and above the maximum background concentration of barium in tuff (51.6 mg/kg) in two of five tuff samples, with concentrations of 228 and 63.9 mg/kg. The box plot for barium in tuff is presented in Figure F-3.14-4. Barium is identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) and above the maximum background concentration of beryllium in tuff (1.8 mg/kg) in one of five tuff samples, at a concentration of 1.9 mg/kg. The box plot for beryllium in tuff is presented in Figure F-3.14-5. Beryllium is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum background concentration of calcium in tuff (2230 mg/kg) in one of five tuff samples, at a concentration of 2630 mg/kg. The sample result is less than 20% above the BV. Based on EPA's Risk Assessment Guidance for Superfund, section 5.9.4, page 5-23, calcium may be eliminated as a COPC if detected infrequently above background (one of five samples) and not substantially above background. The box plot for calcium in tuff is presented in Figure F-3.14-6. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) and above the maximum background concentration of chromium in tuff (13 mg/kg) in one of five tuff samples, at a concentration of 14.5 mg/kg. The box plot for chromium in tuff is presented in Figure F-3.14-7. Chromium is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) and above the maximum background concentration of copper in tuff (6.2 mg/kg) in one of five tuff samples, at a concentration of 11.5 mg/kg. The box plot for copper in tuff is presented in Figure F-3.14-8. Copper is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) and above the maximum background concentration of lead in tuff (15.5 mg/kg) in two of five tuff samples, with concentrations of 73.1 and 24.1 mg/kg. The box plot for lead in tuff is presented in Figure F-3.14-9. Lead is identified as a COPC in tuff.

Magnesium was detected above the BV (1690 mg/kg) in one of five tuff samples, at a concentration of 2090 mg/kg. The sample result did not exceed the maximum background concentration of magnesium in tuff (2820 mg/kg). The box plot for magnesium in tuff is presented in Figure F-3.14-10. Magnesium is not identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in one of five tuff samples, at a concentration of 9.7 mg/kg. The box plot for nickel in tuff is presented in Figure F-3.14-11. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in one or more tuff samples and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was detected above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in three of five tuff samples, with a maximum concentration of 1.4 mg/kg. The box plot for selenium in tuff is presented in Figure F-3.14-12. Selenium is identified as a COPC in tuff.

Thallium was detected above the BV (1.1 mg/kg) and above the maximum background concentration of thallium in tuff (1.7 mg/kg) in one of five tuff samples, at a concentration of 1.8 mg/kg. The box plot for thallium in tuff is presented in Figure F-3.14-13. Thallium is identified as a COPC in tuff.

F-3.14.1.3 Inorganic Chemicals in Sediment

Four sediment samples from SWMU 01-003(b) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Antimony was not detected, but has a DL (2.1 mg/kg) above the BV (0.83 mg/kg) in one of four sediment samples. Results were compared only to the BV because a background dataset for antimony in sediment is not available. Antimony is identified as a COPC in sediment.

Beryllium was detected above the BV (1.31 mg/kg) and above the maximum background concentration of beryllium in sediment (1.3 mg/kg) in one of four sediment samples, at a concentration of 1.5 mg/kg. The box plot for beryllium in sediment is presented in Figure F-3.14-14. Beryllium is identified as a COPC in sediment.

Nitrate was detected in three of four sediment samples and has no BV. Nitrate is identified as a COPC in sediment.

Selenium was detected above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in sediment (0.1 mg/kg) in one of four sediment samples, at a concentration of 0.5 mg/kg. The box plot for selenium in sediment is presented in Figure F-3.14-15. Selenium is identified as a COPC in sediment.

F-3.14.2 Organic Chemicals at SWMU 01-003(b)

No samples from SWMU 01-003(b) were analyzed for organic chemicals.

F-3.14.3 Radionuclides at SWMU 01-003(b)

All 10 samples collected at SWMU 01-003(b) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.16-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.16-3 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 6.16-3.

F-3.14.3.1 Radionuclides in Soil

One fill sample from SWMU 01-003(b) was analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Cesium-137 was detected in the fill sample at a depth where the FV does not apply, at a concentration of 0.168 pCi/g. Cesium-137 is identified as a COPC in soil.

Plutonium-239/240 was detected in the fill sample at a depth where the FV does not apply, at a concentration of 1.63 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

F-3.14.3.2 Radionuclides in Tuff

Five tuff samples from SWMU 01-003(b) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-238 was detected in one of five tuff samples at a concentration of 0.178 pCi/g, and has no tuff FV. Plutonium-238 is identified as a COPC in tuff.

Plutonium-239/240 was detected in one of five tuff samples at a concentration of 0.492 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

F-3.14.3.3 Radionuclides in Sediment

Four sediment samples from SWMU 01-003(b) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) and above the maximum background concentration of plutonium-239/240 in sediment (0.065 pCi/g) in all four sediment samples, with a maximum concentration of 2.11 pCi/g. The box plot for plutonium-239/240 in sediment is presented in Figure F-3.14-16. Plutonium-239/240 is identified as a COPC in sediment.

F-3.14.4 Summary of COPCs at SWMU 01-003(b)

The inorganic chemicals identified as COPCs at SWMU 01-003(b) are aluminum, antimony, arsenic, barium, beryllium, chromium, copper, lead, nickel, nitrate, perchlorate, selenium, and thallium.

No organic COPCs are identified because no samples from SWMU 01-003(b) were analyzed for organic chemicals.

The radionuclides identified as COPCs at SWMU 01-003(b) are cesium-137, plutonium-238, and plutonium-239/240.

F-3.14.5 Nature and Extent of Contamination at SWMU 01-003(b)

F-3.14.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs at SWMU 01-003(b) are aluminum, antimony, arsenic, barium, beryllium, chromium, copper, lead, nickel, nitrate, perchlorate, selenium, and thallium. Sample results are presented in Table 6.16-2 and are shown in Figure 6.16-2.

Concentrations of aluminum, arsenic, barium, beryllium, chromium, copper, lead, nickel, perchlorate, selenium, and thallium increased with depth at location 00-604023. Therefore, the vertical extent of these inorganic COPCs is not defined. Among these COPCs, only barium, beryllium, lead, and selenium were detected above their BVs in samples downslope from location 00-604023, and the concentrations of

those COPCs decrease in the downslope direction. Therefore, the lateral extent is defined for these inorganic COPCs.

Antimony was not detected at the site. Therefore, the lateral and vertical extent of antimony are defined.

Nitrate was detected in nine samples with concentrations of 0.078–2.4 mg/kg. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent of nitrate are defined.

F-3.14.5.2 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs at SWMU 01-003(b) are cesium-137, plutonium-238, and plutonium-239/240. Sample results are presented in Table 6.16-3 and are shown in Figure 6.16-3.

Cesium-137 was detected only once, in the shallower sample at location 00-604023, and decreases with depth. Therefore, the lateral and vertical extent of cesium-137 are defined.

Plutonium-238 was detected only once in the deeper sample at location 00-604026. The lateral and vertical extent of plutonium-238 are defined.

Plutonium-239/240 was detected at all sampling locations but was not detected in the deeper samples at four of the five locations. At the fifth location (00-604026), the concentration of plutonium-239/240 decreases with depth. The concentrations of plutonium-239/240 decreases in the downslope direction. Therefore, the lateral and vertical extent of plutonium-239/240 are defined.

F-3.14.5.3 Summary of Nature and Extent at SWMU 01-003(b)

The vertical extent of aluminum, arsenic, barium, beryllium, chromium, copper, lead, nickel, perchlorate, selenium, and thallium is not defined at location 00-604023.

The lateral and vertical extent are defined for all radionuclide COPCs.

F-3.15 SWMU 01-003(d)

A total of 12 samples (4 soil and 8 tuff) were collected during the 2008–2009 investigation from six locations at SWMU 01-003(d). Table 6.17-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.17-1 is the site map showing sampling locations.

F-3.15.1 Inorganic Chemicals at SWMU 01-003(d)

All 12 samples collected at SWMU 01-003(d) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.17-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.17-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.17-2.

F-3.15.1.1 Inorganic Chemicals in Soil

Four soil samples from SWMU 01-003(d) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Antimony was detected above the BV (0.83 mg/kg) and above the maximum background concentration of antimony in soil (1 mg/kg) in two of four soil samples, with concentrations of 18.4 and 10.6 mg/kg. Antimony is interpreted as being substantially above background, and no further evaluation is necessary. Antimony is identified as a COPC in soil.

Total cyanide was not detected, but had DLs (all 0.51 mg/kg) above the BV (0.5 mg/kg) in three of four soil samples. Results were compared only to the BV because a background dataset for total cyanide in soil is not available. The DLs are essentially equal to the BV. Total cyanide is not identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) and above the maximum background concentration of lead in soil (28 mg/kg) in one of four soil samples, at a concentration of 62.1 mg/kg. The box plot for lead in soil is presented in Figure F-3.15-1. Lead is identified as a COPC in soil.

Nitrate and perchlorate were detected in soil samples and have no BVs. Nitrate and perchlorate are identified as COPCs in soil.

Zinc was detected above the BV (48.8 mg/kg) in three of four soil samples, with a maximum concentration of 94.2 mg/kg. One of the three results also exceeded the maximum background concentration of zinc in soil (75.5 mg/kg). The box plot for zinc in soil is presented in Figure F-3.15-2. Zinc is identified as a COPC in soil.

F-3.15.1.2 Inorganic Chemicals in Tuff

Eight tuff samples from SWMU 01-003(d) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Antimony was detected above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in three of eight tuff samples, with a maximum concentration of 129 mg/kg. Antimony is interpreted as being substantially above background, and no further evaluation is necessary. Antimony is identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) and above the maximum background concentration of barium in tuff (51.6 mg/kg) in one of eight tuff samples, at a concentration of 339 mg/kg. Barium is interpreted as being substantially different than background, and no further evaluation is necessary. Barium is identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in one of eight tuff samples, at a concentration of 1.6 mg/kg. The sample result did not exceed the maximum background concentration of beryllium in tuff (1.8 mg/kg). The box plot for beryllium in tuff is presented in Figure F-3.15-3. Beryllium is not identified as COPCs in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum background concentration of calcium in tuff (2230 mg/kg) in one of eight tuff samples, at a concentration of 2880 mg/kg. The sample concentration is less than twice the BV. Based on EPA's Risk Assessment Guidance for Superfund, section 5.9.4, page 5-23, calcium may be eliminated as a COPC if detected infrequently above background (one of eight samples) and not substantially above background. The box plot for calcium in tuff is presented in Figure F-3.15-4. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in two of eight tuff samples, with concentrations of 11 and 10.9 mg/kg. Neither result exceeded the maximum background concentration of chromium in tuff

(13 mg/kg). The box plot for chromium in tuff is presented in Figure F-3.15-5. Chromium is not identified as a COPC in tuff.

Total cyanide was not detected, but had DLs (all 0.51 mg/kg) above the BV (0.5 mg/kg) in three of eight tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. The DLs are essentially equal to the BV. Total cyanide is not identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) and above the maximum background concentration of lead in tuff (15.5 mg/kg) in one of eight tuff samples, at a concentration of 164 mg/kg. Lead is interpreted as being substantially different than background, and no further evaluation is necessary. Lead is identified as a COPC in tuff.

Nitrate and perchlorate were detected in one or more tuff samples and have no BVs for tuff. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was detected above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in three of eight tuff samples, with a maximum concentration of 0.62 mg/kg. The box plot for selenium in tuff is presented in Figure F-3.15-6. Selenium is identified as a COPC in tuff.

Zinc was detected above the BV (63.5 mg/kg) and above the maximum background concentration of zinc in tuff (65.6 mg/kg) in one of eight tuff samples, at a concentration of 399 mg/kg. Zinc is interpreted as being substantially different than background, and no further evaluation is necessary. Zinc is identified as a COPC in tuff.

F-3.15.2 Organic Chemicals at SWMU 01-003(d)

All 12 samples collected at SWMU 01-003(d) were analyzed for PCBs, SVOCs, and VOCs. Table 6.17-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.17-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.17-3.

F-3.15.2.1 Organic Chemicals in Soil

Four soil samples from SWMU 01-003(d) were analyzed for PCBs, SVOCs, and VOCs. Aroclor-1260 and toluene were detected in one or more soil samples, and are identified as COPCs in soil.

F-3.15.2.2 Organic Chemicals in Tuff

Eight tuff samples from SWMU 01-003(d) were analyzed for PCBs, SVOCs, and VOCs.

Bis(2-ethylhexyl)phthalate and toluene each were detected in one of eight tuff samples and are identified as COPCs in tuff.

F-3.15.3 Radionuclides at SWMU 01-003(d)

All 12 samples collected at SWMU 01-003(d) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.17-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.17-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 6.17-4.

F-3.15.3.1 Radionuclides in Soil

Four soil samples from SWMU 01-003(d) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected in all four soil samples at depths where the FV does not apply, with a maximum concentration of 0.59 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

F-3.15.3.2 Radionuclides in Tuff

Eight tuff samples from SWMU 01-003(d) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Cesium-137 was detected in one of eight tuff samples at a concentration of 0.192 pCi/g, and has no FV for tuff. Cesium-137 is identified as a COPC in tuff.

Plutonium-239/240 was detected in two of eight tuff samples with concentrations of 0.139 and 0.084 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

F-3.15.4 Summary of COPCs at SWMU 01-003(d)

The inorganic chemicals identified as COPCs at SWMU 01-003(d) are antimony, barium, lead, nitrate, perchlorate, selenium, and zinc.

The organic chemicals identified as COPCs at SWMU 01-003(d) are Aroclor-1260, bis(2-ethylhexyl)phthalate, and toluene.

The radionuclides identified as COPCs at SWMU 01-003(d) are cesium-137 and plutonium-239/240.

F-3.15.5 Nature and Extent of Contamination at SWMU 01-003(d)

F-3.15.5-1 Nature and Extent of Inorganic COPCs

The inorganic COPCs at SWMU 01-003(d) are antimony, barium, lead, nitrate, perchlorate, selenium, and zinc. Sample results are presented in Table 6.17-2 and are shown in Figure 6.17-2.

Antimony was detected above its BV at three locations. The concentrations of antimony decrease with depth at all locations. Therefore, the vertical extent of antimony is defined. The highest concentration of antimony (129 mg/kg, more than 100 times the BV) is at location 00-604032, on the downslope side of the site. Therefore, the lateral extent of antimony is not defined.

Barium was detected above its BV only once, and decreases with depth. The sample concentration at location 00-604032 (339 mg/kg) is more than 7 times the BV. The vertical extent of barium is defined, but not its lateral extent.

Lead was detected above its BV twice and decreases with depth. Therefore, the vertical extent of lead is defined. The highest concentration of lead (164 mg/kg, more than 10 times the BV) is on the downslope side of the site. Therefore, the lateral extent of lead is not defined.

Nitrate was detected in eight samples at four locations. The concentration of nitrate decreases or remains relatively unchanged with depth at three of the four locations. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected in three samples with concentrations near EDLs. Therefore, the lateral and vertical extent of perchlorate are defined.

Selenium was detected above its BV at four of six locations. It was detected above its BV in only the deeper samples at locations 00-604032, 00-604031, and 00-604030, all on the downslope side of the site. Therefore, the lateral and vertical extent of selenium are not defined.

Zinc was detected above its BV in the surface sample only at four locations, and decreases with depth. The highest concentration of zinc (399 mg/kg, more than 6 times the BV) is at location 00-604032 on the downslope side of the site. Therefore, the vertical extent of zinc is defined but not its lateral extent.

F-3.15.5-2 Nature and Extent of Organic COPCs

The organic COPCs at SWMU 01-003(d) are Aroclor-1260, bis(2-ethylhexyl)phthalate, and toluene. Sample results are presented in Table 6.17-3 and Figure 6.17-3.

Aroclor-1260 was detected only once, in the surface sample at location 00-604027, on the upslope side of the site. The concentration of Aroclor-1260 decreases with depth. Therefore, the lateral and vertical extent of Aroclor-1260 are defined.

Bis(2-ethylhexyl)phthalate was detected only once, in the deeper sample at location 00-604030. The sample concentration is below the EQL. Therefore, the lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Toluene was detected twice, in the shallower samples at locations 00-604031 and 00-604032, and decreases with depth at both locations. Therefore, the lateral and vertical extent of toluene are defined.

F-3.15.5-3 Nature and Extent of Radionuclide COPCs

The radionuclides identified as COPCs at SWMU 01-003(d) are cesium-137 and plutonium-239/240. Sample results are presented in Table 6.17-4 and Figure 6.17-4.

Cesium-137 was detected only once, in the surface sample at location 00-604032, and decreases with depth. Therefore, the lateral and vertical extent of cesium-137 are defined.

Plutonium-239/240 was detected in the shallower samples at all six locations, and decreases with depth. The concentrations of plutonium-239/240 also decreases downslope. Therefore, the lateral and vertical extent of plutonium-239/240 are defined.

F-3.15.5-4 Summary of Nature and Extent at SWMU 01-003(d)

The lateral extent is not defined for antimony, barium, lead, and zinc. The lateral and vertical extent are not defined for selenium.

The lateral and vertical extent are defined for all organic COPCs.

The lateral and vertical extent are defined for all radionuclide COPCs.

F-3.16 SWMU 01-003(e)

A total of 14 samples (7 soil and fill, 3 tuff, and 4 sediment) were collected during the 2008–2009 investigation from 10 locations at SWMU 01-003(e). Table 6.18-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.18-1 is the site map showing sampling locations.

F-3.16.1 Inorganic Chemicals at SWMU 01-003(e)

All 14 samples collected at SWMU 01-003(e) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.18-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.18-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.18-2.

F-3.16.1.1 Inorganic Chemicals in Soil

Seven soil and fill samples from SWMU 01-003(e) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Total cyanide was not detected, but had a DL (0.51 mg/kg) above the BV (0.5 mg/kg) in one of seven soil and fill samples. The DL is essentially equal to the BV. Results were compared only to the BV because a background dataset for total cyanide in soil is not available. Because total cyanide only has a DL that is slightly and infrequently above background (one of seven samples), total cyanide is not identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) and above the maximum background concentration of lead in soil (28 mg/kg) in one of seven soil and fill samples, at a concentration of 29.1 mg/kg. The box plot for lead in soil is presented in Figure F-3.16-1. Lead is identified as a COPC in soil.

Nitrate was detected in six of seven soil and fill samples and has no BV. Nitrate is identified as a COPC in soil.

F-3.16.1.2 Inorganic Chemicals in Tuff

Three tuff samples from SWMU 01-003(e) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Antimony was not detected, but had a DL (0.51 mg/kg) above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in one of three tuff samples. The DL is essentially equal to the BV. Therefore, antimony is not identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in two of three tuff samples, with concentrations of 2.5 and 1.6 mg/kg. One of the two results also exceeded the maximum background concentration of beryllium in tuff (1.8 mg/kg). The box plot for beryllium in tuff is presented in Figure F-3.16-2. Beryllium is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum background concentration of calcium in tuff (2230 mg/kg) in one of three tuff samples, at a concentration of 6100 mg/kg. The box plot for calcium in tuff is presented in Figure F-3.16-3. Calcium is identified as a COPC in tuff.

Total cyanide was not detected, but had DLs (0.51 and 0.52 mg/kg) above the BV (0.5 mg/kg) in two of three tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in two of three tuff samples, with concentrations of 7.9 and 9.8 mg/kg. The box plot for nickel in tuff is presented in Figure F-3.16-4. Nickel is identified as a COPC in tuff.

Perchlorate was detected in one of three tuff samples and has no BV. Perchlorate is identified as a COPC in tuff.

Selenium was detected above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in one of three tuff samples, at a concentration of 0.46 mg/kg. The box plot for selenium in tuff is presented in Figure F-3.16-5. Selenium is identified as a COPC in tuff.

F-3.16.1.3 Inorganic Chemicals in Sediment

Four sediment samples from SWMU 01-003(e) were analyzed for TAL metals, perchlorate, and cyanide (total).

Antimony was not detected, but had a DL (1.9 mg/kg) above the BV (0.83 mg/kg) in one of four sediment samples. Results were compared only to the BV because a background dataset for antimony in sediment is not available. Antimony is identified as a COPC in sediment.

Lead was detected above the BV (19.7 mg/kg) in three of four sediment samples, with a maximum concentration of 30.6 mg/kg. One of the three results also exceeded the maximum background concentration of lead in sediment (25.6 mg/kg). The box plot for lead in sediment is presented in Figure F-3.16-6. Lead is identified as a COPC in sediment.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in sediment (0.03 mg/kg) in two of four sediment samples, with concentrations of 0.129 and 0.11 mg/kg. The box plot for mercury in sediment is presented in Figure F-3.16-7. Mercury is identified as a COPC in sediment.

Selenium was not detected, but has DLs (0.51–0.55 mg/kg) above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in sediment (0.1 mg/kg) in all four sediment samples. Selenium is identified as a COPC in sediment.

Zinc was detected above the BV (60.2 mg/kg) and above the maximum background concentration of zinc in sediment (56.2 mg/kg) in one of four sediment samples, at a concentration of 63.8 mg/kg. The box plot for zinc in sediment is presented in Figure F-3.16-8. Zinc is identified as a COPC in sediment.

F-3.16.2 Organic Chemicals at SWMU 01-003(e)

All 14 samples collected at SWMU 01-003(e) were analyzed for PCBs, SVOCs, and VOCs. Table 6.18-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.18-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.18-3.

F-3.16.2.1 Organic Chemicals in Soil

Seven soil and fill samples from SWMU 01-003(e) were analyzed for PCBs, SVOCs, and VOCs.

Acenaphthene, anthracene, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, 2-butanone, sec-butylbenzene, chloromethane, chrysene, dibenz(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 4-isopropyltoluene, methylene chloride, naphthalene, phenanthrene, pyrene, styrene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene were detected in one or more soil and fill samples and are identified as COPCs in soil and fill.

F-3.16.2.2 Organic Chemicals in Tuff

Three tuff samples from SWMU 01-003(e) were analyzed for PCBs, SVOCs, and VOCs.

Di-n-butylphthalate was detected in one tuff sample and is identified as a COPC in tuff.

F-3.16.2.3 Organic Chemicals in Sediment

Four sediment samples from SWMU 01-003(e) were analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, sec-butylbenzene, chrysene, fluoranthene, 4-isopropyltoluene, phenanthrene, 1-propylbenzene, pyrene, tetrachloroethene, toluene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene were detected in one or more sediment samples and are identified as COPCs in sediment.

F-3.16.3 Radionuclides at SWMU 01-003(e)

All 14 samples collected at SWMU 01-003(e) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.18-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.18-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 6.18-4.

F-3.16.3.1 Radionuclides in Soil

Seven soil and fill samples from SWMU 01-003(e) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Cesium-137 was detected in two fill samples at depths where the FV does not apply, with concentrations of 0.111 and 0.162 pCi/g. Cesium-137 is identified as a COPC in soil.

Plutonium-239/240 was detected in four soil and fill samples at depths where the FV does not apply, with a maximum concentration of 0.087 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

Tritium was detected in one fill sample at a concentration of 0.64 pCi/g, and has no soil FV. Tritium is identified as a COPC in soil.

F-3.16.3.2 Radionuclides in Tuff

Three tuff samples from SWMU 01-003(e) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

No radionuclides were detected or detected above BVs in any of the tuff samples.

F-3.16.3.3 Radionuclides in Sediment

Four sediment samples from SWMU 01-003(e) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) and above the maximum background concentration of plutonium-239/240 in sediment (0.065 pCi/g) in all four sediment samples, with a maximum concentration of 1.27 pCi/g. The box plot for plutonium-239/240 in sediment is presented in Figure F-3.16-9. Plutonium-239/240 is identified as a COPC in sediment.

F-3.16.4 Summary of COPCs at SWMU 01-003(e)

The inorganic chemicals identified as COPCs at SWMU 01-003(e) are antimony, beryllium, calcium, total cyanide, lead, mercury, nickel, nitrate, perchlorate, selenium, and zinc.

The organic chemicals identified as COPCs at SWMU 01-003(e) are acenaphthene, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, 2-butanone, sec-butylbenzene, chloromethane, chrysene, di-n-butylphthalate, dibenz(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 4-isopropyltoluene, methylene chloride, naphthalene, phenanthrene, 1-propylbenzene, pyrene, styrene, tetrachloroethene, toluene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene.

The radionuclides identified as COPCs at SWMU 01-003(e) are cesium-137, plutonium-239/240, and tritium.

F-3.16.5 Nature and Extent of Contamination at SWMU 01-003(e)

F-3.16.5.1 Nature and Extent of Inorganic COPCs

The inorganic chemicals identified as COPCs at SWMU 01-003(e) are antimony, beryllium, calcium, total cyanide, lead, mercury, nickel, nitrate, perchlorate, selenium, and zinc. Sample results are presented in Table 6.18-2 and Figure 6.18-2.

Antimony and cyanide were not detected at the site. Therefore, the lateral and vertical extent of antimony and cyanide are defined.

Beryllium was detected above its BV in only two samples, the deeper samples at locations 00-604221 and 00-604222 (the two locations farthest downslope from the source). The concentration of beryllium decreases downslope at those locations, and the concentration at location 00-604222 is less than the

maximum background concentration. The concentration at location 00-604221 is less than twice the maximum background concentration. The lateral and vertical extent of beryllium are defined.

Calcium was detected above the BV only in the deepest sample at location 00-604221. Calcium was not detected above the BV in samples at the downslope location 00-604222. Therefore, the lateral and vertical extent of calcium are defined.

Lead was detected above its BV in four samples at three locations and decreases with depth at locations 00-604037 and 00-604222. The concentration of lead increases with depth at location 00-604220, but both concentrations are less than twice the BV and are estimated and potentially biased high. The concentration of lead decreases downslope from its maximum concentration (30.6 mg/kg) at location 00-604220. Therefore, the lateral and vertical extent of lead are defined.

Mercury was detected above its BV in two samples: the surface sample at location 00-604221 and the deeper sample at location 00-604220. The concentrations of mercury (maximum 0.129 mg/kg) are only slightly above the BV (0.1 mg/kg). Mercury was not detected above its BV at the location (00-604222) farthest downslope. The lateral and vertical extent of mercury are defined.

Nickel was detected above its BV in two samples, the deeper samples at locations 00-604219 and 00-604222. The concentration of nickel is less than twice the BV in both samples. Therefore, the lateral and vertical extent of nickel are defined.

Nitrate was detected at six locations and concentrations decreases with depth to nondetect at all six locations. Nitrate was not detected in downslope locations 00-604220, 00-604221, and 00-604222. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected only in the deepest sample at location 00-604221. Perchlorate was not detected in samples from downslope location 00-604222. Therefore, the lateral and vertical extent of perchlorate are defined.

Selenium was detected above its BV in one sample and has DLs above the BV in four samples at three locations. Concentrations decrease with depth at location 00-604221. Therefore, the lateral and vertical extent of selenium are defined.

Zinc was detected above its BV in only one sample, the deeper sample at location 00-604220. This single concentration (63.8 mg/kg) is only slightly above the BV (60.2 mg/kg). Therefore, the lateral and vertical extent of zinc are defined.

F-3.16.5.2 Nature and Extent of Organic COPCs

The organic COPCs at SWMU 01-003(e) are acenaphthene, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, 2-butanone, sec-butylbenzene, chloromethane, chrysene, di-n-butylphthalate, dibenz(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 4-isopropyltoluene, methylene chloride, naphthalene, phenanthrene, 1-propylbenzene, pyrene, styrene, tetrachloroethene, toluene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene. Sample results are presented in Table 6.18-3 and are shown in Figure 6.18-3.

Aroclor-1254 was detected in only one sample, and decreases with depth. Therefore, the lateral and vertical extent of Aroclor-1254 are defined.

Aroclor-1260 was detected in six samples at five locations. Concentrations increase slightly with depth at location 00-604220, but the higher concentration is still low (0.063 mg/kg). Concentrations decrease with depth at all other locations. The lateral and vertical extent of Aroclor-1260 are defined.

Di-n-butylphthalate was detected in the deeper sample at location 00-604219, but the concentration is low (0.046 mg/kg). Concentrations decrease with depth at location 00-604221. Therefore, the lateral and vertical extent of di-n-butylphthalate are defined.

All other organic COPCs were detected in only one or two samples or were detected only in surface samples, and concentrations decrease with depth. Therefore, the lateral and vertical extent of all other organic COPCs are defined.

F-3.16.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs at SWMU 01-003(e) are cesium-137, plutonium-239/240, and tritium. Sample results are presented in Table 6.18-4 and are shown in Figure 6.18-4.

Cesium-137 was detected in two fill samples collected from 0–1 ft bgs. Because the FV only applies to samples from 0–0.5 ft bgs, the samples were not screened against the FV. However, both sample concentrations are more than 10 times lower than the FV for soil and fill. Cesium-137 was not detected in the deeper sample at any locations and was not detected at any locations on the lower part of the slope. Therefore, the lateral and vertical extent of cesium-137 are defined.

Plutonium-239/240 was detected with no applicable FV, or was detected above its sediment FV, in eight samples at seven locations. The concentration increase with depth to 1.27 pCi/g in the deeper sample at location 00-604220. The concentration of plutonium-239/240 decreases downslope from its maximum concentration (1.27 pCi/g) at location 00-604220. In the locations farthest downslope, plutonium-239/240 was not detected in the deeper samples. Therefore, the lateral and vertical extent of plutonium-239/240 are defined.

Tritium was detected in only one sample, and the concentrations decrease with depth. Therefore, the lateral and vertical extent of tritium are defined.

F-3.16.5.4 Summary of Nature and Extent at SWMU 01-003(e)

The lateral and vertical extent are defined for all inorganic COPCs.

The lateral and vertical extent are defined for all organic COPCs.

The lateral and vertical extent are defined for all radionuclide COPCs.

F-3.17 SWMU 01-006(a)

A total of 19 samples (4 soil and fill, 10 tuff, and 5 sediment) were collected during the 2008–2009 investigation from nine locations at SWMU 01-006(a). Table 6.19-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.19-1 is the site map showing sampling locations.

F-3.17.1 Inorganic Chemicals at SWMU 01-006(a)

All 19 samples collected at SWMU 01-006(a) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.19-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.19-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.19-2.

F-3.17.1.1 Inorganic Chemicals in Soil

Four soil and fill samples from SWMU 01-006(a) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Total cyanide was not detected, but had DLs (0.53–0.6 mg/kg) above the BV (0.5 mg/kg) in three of four soil and fill samples. Results were compared only to the BV because a background dataset for total cyanide in soil is not available. Total cyanide is identified as a COPC in soil.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in soil (also 0.1 mg/kg) in one of four soil and fill samples, at a concentration of 0.203 mg/kg. The box plot for mercury in soil is presented in Figure F-3.17-1. Mercury is identified as a COPC in soil.

Nitrate and perchlorate were detected in one of four soil and fill samples and have no BVs. Nitrate and perchlorate are identified as COPCs in soil.

F-3.17.1.2 Inorganic Chemicals in Tuff

Ten tuff samples from SWMU 01-006(a) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Aluminum was detected above the BV (7340 mg/kg) and above the maximum background concentration of aluminum in tuff (8370 mg/kg) in one of ten tuff samples, at a concentration of 9970 mg/kg. Statistical tests were performed to determine if the site sample results for aluminum are different than background. The statistical test results are presented in Table F-3.17-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for aluminum in tuff is presented in Figure F-3.17-2. Aluminum is not identified as a COPC in tuff.

Antimony was not detected, but had DLs (0.61 and 0.54 mg/kg) above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in 2 of 10 tuff samples. The DLs are approximately or less than 20% above the BV. Because antimony only has DLs that are slightly and infrequently above background (two of ten samples), it is not identified as a COPC in tuff.

Arsenic was detected above the BV (2.79 mg/kg) in 4 of 10 tuff samples, with a maximum concentration of 5.5 mg/kg. One of the four results also exceeded the maximum background concentration of arsenic in tuff (5 mg/kg). Statistical tests were performed to determine if the site sample results for arsenic are different than background. The statistical test results are presented in Table F-3.17-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for arsenic in tuff is presented in Figure F-3.17-3. Arsenic is identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) and above the maximum background concentration of barium in tuff (51.6 mg/kg) in 3 of 10 tuff samples, with a maximum concentration of 235 mg/kg. Statistical

tests were performed to determine if the site sample results for barium are different than background. The statistical test results are presented in Table F-3.17-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for barium in tuff is presented in Figure F-3.17-4. Barium is not identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in 1 of 10 tuff samples, at a concentration of 1.5 mg/kg. The sample result did not exceed the maximum background concentration of beryllium in tuff (1.8 mg/kg). Statistical tests were performed to determine if the site sample results for beryllium are different than background. The statistical test results are presented in Table F-3.17-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for beryllium in tuff is presented in Figure F-3.17-5. Beryllium is not identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum background concentration of calcium in tuff (2230 mg/kg) in 2 of 10 tuff samples, with concentrations of 2720 and 5490 mg/kg. Statistical tests were performed to determine if the site sample results for calcium are different than background. The statistical test results are presented in Table F-3.17-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for calcium in tuff is presented in Figure F-3.17-6. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 7 of 10 tuff samples, with a maximum concentration of 18.5 mg/kg. Three of the seven results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). Statistical tests were performed to determine if the site sample results for chromium are different than background. The statistical test results are presented in Table F-3.17-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for chromium in tuff is presented in Figure F-3.17-7. Chromium is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 4 of 10 tuff samples, with a maximum concentration of 11.6 mg/kg. One of the four results also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). Statistical tests were performed to determine if the site sample results for copper are different than background. The statistical test results are presented in Table F-3.17-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for copper in tuff is presented in Figure F-3.17-8. Copper is identified as a COPC in tuff.

Total cyanide was not detected, but had DLs (0.51–0.58 mg/kg) above the BV (0.5 mg/kg) in eight of ten tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 3 of 10 tuff samples, with a maximum concentration of 21.2 mg/kg. One of the three results also exceeded the maximum background concentration of lead in tuff (15.5 mg/kg). Statistical tests were performed to determine if the site sample results for lead are different than background. The statistical test results are presented in Table F-3.17-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for lead in tuff is presented in Figure F-3.17-9. Lead is identified as a COPC in tuff.

Magnesium was detected above the BV (1690 mg/kg) in 1 of 10 tuff samples, at a concentration of 2420 mg/kg. The sample result did not exceed the maximum background concentration of magnesium in tuff (2820 mg/kg). Statistical tests were performed to determine if the site sample results for magnesium are different than background. The statistical test results are presented in Table F-3.17-1. The results of

both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for magnesium in tuff is presented in Figure F-3.17-10. Magnesium is not identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in 4 of 10 tuff samples, with a maximum concentration of 9 mg/kg. Statistical tests were performed to determine if the site sample results for nickel are different than background. The statistical test results are presented in Table F-3.17-1. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for nickel in tuff is presented in Figure F-3.17-11. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in tuff samples and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was detected above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in one of ten tuff samples, at a concentration of 0.35 mg/kg. The sample result is less than 20% above the BV. Statistical tests were not performed because the background data of selenium in Qbt 2,3,4 tuff are all nondetects. The box plot for selenium in tuff is presented in Figure F-3.17-12. Because selenium is detected slightly and infrequently above background (one of ten samples), it is not identified as a COPC in tuff.

F-3.17.1.3 Inorganic Chemicals in Sediment

Five sediment samples from SWMU 01-006(a) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Calcium was detected above the BV (4420 mg/kg) and above the maximum background concentration of calcium in sediment (4240 mg/kg) in one of five sediment samples, at a concentration of 7640 mg/kg. The box plot for calcium in sediment is presented in Figure F-3.17-13. Calcium is identified as a COPC in sediment.

Lead was detected above the BV (19.7 mg/kg) and above the maximum background concentration of lead in sediment (25.6 mg/kg) in one of five sediment samples. The box plot for lead in sediment is presented in Figure F-3.17-14. Lead is identified as a COPC in sediment.

Nitrate and perchlorate were detected in one or more sediment samples and have no BVs. Nitrate and perchlorate are identified as COPCs in sediment.

Selenium was not detected above the BV (0.3 mg/kg), but had a DL (0.53 mg/kg) above the BV and above the maximum background concentration of selenium in sediment (0.1 mg/kg) in one of five sediment samples. Selenium is identified as a COPC in sediment.

F-3.17.2 Organic Chemicals at SWMU 01-006(a)

All 19 samples collected at SWMU 01-006(a) were analyzed for PCBs, SVOCs, and VOCs. Table 6.19-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.19-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.19-3.

F-3.17.2.1 Organic chemicals in Soil

Four soil and fill samples from SWMU 01-006(a) were analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1260 and methylene chloride were detected in one or more soil and fill samples, and are identified as COPCs in soil and fill.

F-3.17.2.2 Organic Chemicals in Tuff

Ten tuff samples from SWMU 01-006(a) were analyzed for PCBs, SVOCs, and VOCs.

Acetone, Aroclor-1260, bis(2-ethylhexyl)phthalate, and methylene chloride were detected in one or more tuff samples and are identified as COPCs in tuff.

F-3.17.2.3 Organic Chemicals in Sediment

Five sediment samples from SWMU 01-006(a) were analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1260, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, and methylene chloride were detected in one or more sediment samples, and are identified as COPCs in sediment.

F-3.17.3 Radionuclides at SWMU 01-006(a)

All 19 samples collected at SWMU 01-006(a) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.19-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.19-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 6.19-4.

F-3.17.3.1 Radionuclides in Soil

Four soil and fill samples from SWMU 01-006(a) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Americium-241 was detected in one of four soil and fill samples at depths where the FV does not apply, at a concentration of 0.187 pCi/g. Americium-241 is identified as a COPC in soil.

Cesium-137 was detected in one of four soil and fill samples at depths where the FV does not apply, at a concentration of 0.111 pCi/g. Cesium-137 is identified as a COPC in soil.

Plutonium-239/240 was detected in all four soil and fill samples at depths where the FV does not apply, with a maximum concentration of 4.08 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

F-3.17.3.2 Radionuclides in Tuff

Ten tuff samples from SWMU 01-006(a) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected in 9 of 10 tuff samples at a maximum concentration of 8.23 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in 3 of 10 tuff samples, with a maximum concentration of 0.214 pCi/g. Results were compared only to the BV because background dataset for uranium-235/236 in tuff is not available. Uranium-235/236 is identified as a COPC in tuff.

F-3.17.3.3 Radionuclides in Sediment

Five sediment samples from SWMU 01-006(a) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Americium-241 was detected above the FV (0.040 pCi/g) and above the maximum background concentration of americium-241 in sediment (0.038 pCi/g) in one of five sediment samples, at a concentration of 0.466 pCi/g. Americium-241 is interpreted as being substantially above background and no further evaluation is necessary. Americium-241 is identified as a COPC in sediment.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) and above the maximum background concentration of plutonium-239/240 in sediment (0.065 pCi/g) in all five sediment samples, with a maximum concentration of 25.8 pCi/g. Plutonium-239/240 is interpreted as being substantially above background and no further evaluation is necessary. Plutonium-239/240 is identified as a COPC in sediment.

Uranium-234 was detected above the BV (2.59 pCi/g) and above the maximum background concentration of uranium-234 in sediment (2.5 pCi/g) in one of five sediment samples, at a concentration of 4.15 pCi/g. The box plot for uranium-234 in sediment is presented in Figure F-3.17-15. Uranium-234 is identified as a COPC in sediment.

Uranium-235/236 was detected above the BV (0.20 pCi/g) and above the maximum background concentration of uranium-235/236 in sediment (0.16 pCi/g) in two of five sediment samples, at concentrations of 0.329 and 0.357 pCi/g. The box plot for uranium-235/236 in sediment is presented in Figure F-3.17-16. Uranium-235/236 is identified as a COPC in sediment.

Uranium-238 was detected above the BV (2.29 pCi/g) and above the maximum background concentration of uranium-238 in sediment (2.1 pCi/g) in one of five sediment samples, at a concentration of 3.12 pCi/g. The box plot for uranium-238 in sediment is presented in Figure F-3.17-17. Uranium-238 is identified as a COPC in sediment.

F-3.17.4 Summary of COPCs at SWMU 01-006(a)

The inorganic chemicals identified as COPCs at SWMU 01-006(a) are arsenic, calcium, chromium, copper, total cyanide, lead, mercury, nickel, nitrate, perchlorate, and selenium.

The organic chemicals identified as COPCs at SWMU 01-006(a) are acetone, Aroclor-1260, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, and methylene chloride.

The radionuclides identified as COPCs at SWMU 01-006(a) are americium-241, cesium-137, plutonium-239/240, uranium-234, uranium-235/236, and uranium-238.

F-3.17.5 Nature and Extent of Contamination at SWMU 01-006(a)

F-3.17.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 01-006(a) are arsenic, calcium, chromium, copper, total cyanide, lead, mercury, nickel, nitrate, perchlorate, and selenium. Sample results are presented in Table 6.19-2 and Figure 6.19-2.

Concentrations of arsenic decrease with depth at location 00-604039, remain the same with depth at location 00-604044, and increase with depth at location 00-604042. Arsenic concentration in the deepest sample at location 00-604042 is less than twice the BV, and concentrations at location 00-604044 are approximately 10% above the BV. Arsenic was not detected above the BV in samples from the downslope locations 00-604045 and 00-604046. Therefore, the lateral and vertical extent of arsenic are defined.

Concentrations of calcium increase with depth at location 00-604042 and decrease with depth at location 00-604045. Calcium concentration in the deepest sample at location 00-604042 is less than twice the BV. Calcium was not detected above the BV in samples from the farthest downslope location 00-604046. Therefore, the lateral and vertical extent of calcium are defined.

Concentrations of chromium and nickel increase with depth at multiple locations. However, all concentrations are below or slightly above the maximum tuff background concentrations of chromium (13 mg/kg) and nickel (7 mg/kg). Therefore, the lateral and vertical extent of chromium and nickel are defined.

Concentrations of copper and lead increase with depth at several locations. However, all copper concentrations are less than twice the maximum tuff background concentration (6.2 mg/kg), and all lead concentrations are less than twice the BV, except for the detection of 42.8 mg/kg at location 00-604043. Concentrations decrease with depth at this location. Copper and lead were not detected above BV in samples from similar depths at the site or at the two most downslope locations 00-604045 and 00-604046. Therefore, the lateral and vertical extent of copper and lead are defined.

Cyanide and selenium were not detected at the site. Therefore, the lateral and vertical extent of cyanide and selenium are defined.

Mercury was detected above BV in only one sample at a concentration approximately twice the BV and decreases with depth. Therefore, the lateral and vertical extent of mercury are defined.

Nitrate was detected in ten samples at concentrations of 0.084–2.3 mg/kg. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected at only four locations, and concentrations are all at low levels. Therefore, the lateral and vertical extent of perchlorate are defined.

F-3.17.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 01-006(a) are acetone, Aroclor-1260, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, and methylene chloride. Sample results are presented in Table 6.19-3 and Figure 6.19-3.

Aroclor-1260 was detected at all locations and decreases with depth. The concentration of Aroclor-1260 decreases at the most downslope location. Therefore the lateral and vertical extent of Aroclor-1260 are defined.

The majority of detections are at concentrations at or below the EQLs, except for bis(2-ethylhexyl)phthalate (detected at 2.7 mg/kg in the deepest sample at location 00-604047). However, bis(2-ethylhexyl)phthalate was not detected in similar depth samples collected at downslope location 00-604041. Concentrations decrease with depth at the most downslope locations and are at or below EQLs. Therefore, the lateral and vertical extent of all organic COPCs are defined.

F-3.17.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs identified at SWMU 01-006(a) are americium-241, cesium-137, plutonium-239/240, uranium-234, uranium-235/236, and uranium-238. Sample results are presented in Table 6.19-4 and are shown in Figure 6.19-4.

Americium-241, cesium-137, uranium-234, uranium-238 were detected in only one or two samples each at the site, and concentrations all decrease with depth. They were not detected or detected above BVs in samples at the most downslope location (00-604046). Therefore, the lateral and vertical extent of these COPCs are defined.

Concentrations of plutonium-239/240 decrease with depth, except at location 00-604041. It was detected at concentrations substantially higher than FVs at several locations including 00-604041. It was detected at low levels (<0.6 pCi/g) in the two samples at the most downslope location (00-604046). Therefore, the lateral extent of plutonium-239/240 is defined but not the vertical extent.

Concentrations of uranium-235/236 increase with depth at locations 00-604041 and 00-604044. Therefore, the lateral and vertical extent of uranium-235/236 are not defined.

F-3.17.5.4 Summary of Nature and Extent at SWMU 01-006(a)

The lateral and vertical extent of all inorganic, organic, radionuclide COPCs are defined at SWMU 01-006(a), except for the vertical extent of plutonium-239/240 and the lateral and vertical extent of uranium-235/236.

F-3.18 SWMU 01-006(b)

A total of 11 samples (4 soil, 6 tuff, and 1 sediment) were collected during the 2008–2009 investigation from five locations at SWMU 01-006(b). Table 6.20-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.20-1 is the site map showing sampling locations.

F-3.18.1 Inorganic Chemicals at SWMU 01-006(b)

All 11 samples collected at SWMU 01-006(b) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.20-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.20-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.20-2.

F-3.18.1.1 Inorganic Chemicals in Soil

Four soil samples from SWMU 01-006(b) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Antimony was not detected, but had DLs (1.5–3.3 mg/kg) above the BV (0.83 mg/kg) and above the maximum background concentration of antimony in soil (1 mg/kg) in three of four soil samples. Antimony is identified as a COPC in soil.

Total cyanide was detected above the BV (0.5 mg/kg) in one of four soil samples, at a concentration of 0.71 mg/kg. Results were compared only to the BV because a background dataset for total cyanide in soil is not available. Total cyanide is identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) in three of four soil samples, with a maximum concentration of 61.1 mg/kg. Two of the three results also exceeded the maximum background concentration of lead in soil (28 mg/kg). The box plot for lead in soil is presented in Figure F-3.18-1. Lead is identified as a COPC in soil.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in soil (also 0.1 mg/kg) in one of four soil samples, at a concentration of 0.123 mg/kg. The box plot for mercury in soil is presented in Figure F-3.18-2. Mercury is identified as a COPC in soil.

Nitrate and perchlorate were detected in soil samples and have no BVs. Nitrate and perchlorate are identified as COPCs in soil.

F-3.18.1.2 Inorganic Chemicals in Tuff

Six tuff samples from SWMU 01-006(b) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Antimony was not detected, but had DLs (0.54 and 0.59 mg/kg) above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in two of six tuff samples. Antimony is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) and above the maximum background concentration of chromium in tuff (13 mg/kg) in one of six tuff samples, at a concentration of 29.9 mg/kg. The box plot for chromium in tuff is presented in Figure F-3.18-3. Chromium is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in one of six tuff samples, at a concentration of 4.7 mg/kg. The sample result did not exceed the maximum background concentration of copper in tuff (6.2 mg/kg). The box plot for copper in tuff is presented in Figure F-3.18-4. Copper is not identified as a COPC in tuff.

Total cyanide was detected above the BV (0.5 mg/kg) in one of six tuff samples, at a concentration of 0.62 mg/kg. Total cyanide also had DLs (0.54 and 0.52 mg/kg) above the BV in two tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in three of six tuff samples, with a maximum concentration of 44.3 mg/kg. Two of the three results also exceeded the maximum background concentration of lead in tuff (15.5 mg/kg). The box plot for lead in tuff is presented in Figure F-3.18-5. Lead is identified as a COPC in tuff.

Mercury was detected above the BV (0.1 mg/kg) in one of six tuff samples, at a concentration of 0.115 mg/kg. The sample result is less than 20% above the BV. Results were compared only to the BV because a background dataset for mercury in tuff is not available. Because mercury is detected slightly and infrequently above background (one of six samples), it is not identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in two of six tuff samples, with concentrations of 14 and 8.4 mg/kg. The box plot for nickel in tuff is presented in Figure F-3.18-6. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in one or more tuff samples and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was not detected, but had DLs (0.51–0.54 mg/kg) above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in all six tuff samples. Selenium is identified as a COPC in tuff.

F-3.18.1.3 Inorganic Chemicals in Sediment

One sediment sample from SWMU 01-006(b) was analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Lead was detected above the BV (19.7 mg/kg) and above the maximum background concentration of lead in sediment (25.6 mg/kg) in the sediment sample, at a concentration of 34.3 mg/kg. The box plot for lead in sediment is presented in Figure F-3.18-7. Lead is identified as a COPC in sediment.

Nickel was detected above the BV (9.38 mg/kg) and above the maximum background concentration of nickel in sediment (8.9 mg/kg) in the sediment sample, at a concentration of 10.1 mg/kg. The box plot for nickel in sediment is presented in Figure F-3.18-8. Nickel is identified as a COPC in sediment.

Nitrate was detected in the sediment sample and has no BV. Nitrate is identified as a COPC in sediment.

Selenium was not detected but had a DL (0.52 mg/kg) above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in sediment (0.1 mg/kg) in the sediment sample. Selenium is identified as a COPC in sediment.

F-3.18.2 Organic Chemicals at SWMU 01-006(b)

All 11 samples collected at SWMU 01-006(b) were analyzed for PCBs, SVOCs, and VOCs. Table 6.20-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.20-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.20-3.

F-3.18.2.1 Organic Chemicals in Soil

Four soil samples from SWMU 01-006(b) were analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzoic acid, butylbenzylphthalate, chrysene, fluoranthene, phenanthrene, pyrene, and trichlorofluoromethane were detected in one or more soil samples, and are identified as COPCs in soil.

F-3.18.2.2 Organic Chemicals in Tuff

Six tuff samples from SWMU 01-006(b) were analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1260, bis(2-ethylhexyl)phthalate, 4,6-dinitro-2-methylphenol, 4-isopropyltoluene, and methylene chloride were detected in one or more tuff samples, and are identified as COPCs in tuff.

F-3.18.2.3 Organic Chemicals in Sediment

One sediment sample from SWMU 01-006(b) was analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1254, Aroclor-1260, benzo(b)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, fluoranthene, and pyrene were detected and are identified as COPCs in sediment.

F-3.18.3 Radionuclides at SWMU 01-006(b)

All 11 samples collected at SWMU 01-006(b) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.20-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.20-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 6.20-4.

F-3.18.3.1 Radionuclides in Soil

Four soil samples from SWMU 01-006(b) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Americium-241 was detected in all four soil samples at depths where the FV does not apply, with a maximum concentration of 15.4 pCi/g. Americium-241 is identified as a COPC in soil.

Plutonium-239/240 was detected in all four soil samples at depths where the FV does not apply, with a maximum concentration of 1030 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

F-3.18.3.2 Radionuclides in Tuff

Six tuff samples from SWMU 01-006(b) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Americium-241 was detected in two of six tuff samples with concentrations of 1.51 and 0.4 pCi/g, and has no tuff FV. Americium-241 is identified as a COPC in tuff.

Plutonium-239/240 was detected in five of six tuff samples with a maximum concentration of 113 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

F-3.18.3.3 Radionuclides in Sediment

One sediment sample from SWMU 01-006(b) was analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Americium-241 was detected above the FV (0.040 pCi/g) and above the maximum background concentration of americium-241 in sediment (0.038 pCi/g) in the sediment sample, at a concentration of 0.334 pCi/g. Americium-241 is interpreted as being substantially above background and no further evaluation is necessary. Americium-241 is identified as a COPC in sediment.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) and above the maximum background concentration of plutonium-239/240 in sediment (0.065 pCi/g) in the sediment sample, at a concentration of 33.5 pCi/g. Plutonium-239/240 is interpreted as being substantially above background and no further evaluation is necessary. Plutonium-239/240 is identified as a COPC in sediment.

F-3.18.4 Summary of COPCs at SWMU 01-006(b)

The inorganic chemicals identified as COPCs at SWMU 01-006(b) are antimony, chromium, total cyanide, lead, mercury, nickel, nitrate, perchlorate, and selenium.

The organic chemicals identified as COPCs at SWMU 01-006(b) are Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzoic acid, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, chrysene, 4,6-dinitro-2-methylphenol, fluoranthene, 4-isopropyltoluene, methylene chloride, phenanthrene, pyrene, and trichlorofluoromethane.

The radionuclides identified as COPCs at SWMU 01-006(b) are americium-241 and plutonium-239/240.

F-3.18.5 Nature and Extent of Contamination at SWMU 01-006(b)

F-3.18.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 01-006(b) are antimony, chromium, total cyanide, lead, mercury, nickel, nitrate, perchlorate, and selenium. Sample results are presented in Table 6.20-2 and Figure 6.20-2.

Antimony and selenium were not detected at the site. Therefore, the lateral and vertical extent of antimony and selenium are defined.

Chromium was detected above BV in only one sample at a concentration less than 3 times the maximum tuff background concentration (13 mg/kg). Therefore, the lateral and vertical extent of chromium are defined.

Cyanide and mercury were detected above BV in only two samples. Cyanide (total) decreases with depth at one location and is slightly above the BV at the other location. Mercury decreases with depth and is only slightly above the BV. Therefore, the lateral and vertical extent of cyanide and mercury are defined.

Concentrations of lead decrease with depth at three of four locations. The concentration at the fourth location is approximately 2 times the BV, and lead was not detected above the BV in the surface sample. Therefore, the lateral and vertical extent of lead are defined.

Nickel was detected above BV in three samples. Concentrations decrease with depth at one location, and are less than twice the maximum tuff background concentrations (7 mg/kg) at the other two locations. Therefore, the lateral and vertical extent of nickel are defined.

Nitrate was detected in all samples at concentrations of 0.14–4.9 mg/kg. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent of nitrate are defined.

Concentrations of perchlorate decreased with depth at location 00-604237. Perchlorate was detected at location 00-604224 and was not detected in samples from similar depths at downslope locations 00-604224 and 00-604226. Therefore, the lateral and vertical extent of perchlorate are defined.

F-3.18.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 01-006(b) are Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzoic acid, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, chrysene, 4,6-dinitro-2-methylphenol, fluoranthene, 4-isopropyltoluene, methylene chloride, phenanthrene, pyrene, and trichlorofluoromethane. Sample results are presented in Table 6.20-3 and Figure 6.20-3.

The majority of detections are at low levels near or below the EQLs, and concentrations decrease with depth at all locations, except for 4,6-dinitro-2-methylphenol and 4-isopropyltoluene. These COPCs were detected in the deeper samples at two locations but were not detected elsewhere. Therefore, the lateral and vertical extent of all organic COPCs are defined.

F-3.18.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs identified at SWMU 01-006(b) are americium-241 and plutonium-239/240. Sample results are presented in Table 6.20-4 and Figure 6.20-4.

Concentrations of americium-241 and plutonium-239/240 decrease with depth at all locations. However, their concentrations were still elevated in the deepest samples. Therefore,vertical extent is not defined. Americium-241 and plutonium-239/240 were detected at elevated concentrations at the farthest location to the west (location 00-604225); therefore, the lateral extent is not defined.

F-3.18.5.4 Summary of Nature and Extent for SWMU 01-006(b)

The lateral and vertical extent for all inorganic and organic COPCs are defined at SWMU 01-006(b).

The lateral extent of americium-241 and plutonium-239/240 is not defined at SWMU 01-006(b). Although there is a decreasing trend of plutonium-239/240, it is still elevated in the deepest sample and, therefore, the vertical extent is not adequately defined for plutonium-239/240.

F-3.19 SWMU 01-006(c)

Two samples (one tuff and one sediment) were collected during the 2008–2009 investigation from one location at SWMU 01-006(c). Table 6.21-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.21-1 is the site map showing sampling locations.

F-3.19.1 Inorganic Chemicals at SWMU 01-006(c)

Both samples collected at SWMU 01-006(c) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.21-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.21-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.21-2.

F-3.19.1.1 Inorganic Chemicals in Tuff

One tuff sample from SWMU 01-006(c) was analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Barium was detected above the BV (46.0 mg/kg) and above the maximum background concentration of barium in tuff (51.6 mg/kg) in the tuff sample, at a concentration of 82.1 mg/kg. The box plot for barium in tuff is presented in Figure F-3.19-1. Barium is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) and above the maximum background concentration of chromium in tuff (13 mg/kg) in the tuff sample, at a concentration of 29.2 mg/kg. The box plot for chromium in tuff is presented in Figure F-3.19-2. Chromium is identified as a COPC in tuff.

Total cyanide was not detected, but the DL (0.53 mg/kg) was above the BV (0.5 mg/kg) in the tuff sample. Total cyanide is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in the tuff sample, at a concentration of 15.8 mg/kg. The box plot for nickel in tuff is presented in Figure F-3.19-3. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in the tuff sample and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was not detected, but had a DL (0.53 mg/kg) above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in the tuff sample. Selenium is identified as a COPC in tuff.

F-3.19.1.2 Inorganic Chemicals in Sediment

One sediment sample from SWMU 01-006(c) was analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Barium was detected above the BV (127 mg/kg) and above the maximum background concentration of barium in sediment (also 127 mg/kg) in the sediment sample, at a concentration of 172 mg/kg. The box plot for barium in sediment is presented in Figure F-3.19-4. Barium is identified as a COPC in sediment.

Cobalt was detected above the BV (4.73 mg/kg) and above the maximum background concentration of cobalt in sediment (4.2 mg/kg) in the sediment sample, at a concentration of 8.8 mg/kg. The box plot for cobalt in sediment is presented in Figure F-3.19-5. Cobalt is identified as a COPC in sediment.

Lead was detected above the BV (19.7 mg/kg) and above the maximum background concentration of lead in sediment (25.6 mg/kg) in the sediment sample, at a concentration of 67.9 mg/kg. The box plot for lead in sediment is presented in Figure F-3.19-6. Lead is identified as a COPC in sediment.

Manganese was detected above the BV (543 mg/kg) and above maximum background concentration of manganese in sediment (517 mg/kg) in the sediment sample, at a concentration of 764 mg/kg. The box plot for manganese in sediment is presented in Figure F-3.19-7. Manganese is identified as a COPC in sediment.

Selenium was not detected, but the DL (2.6 mg/kg) was above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in sediment (0.1 mg/kg) in the sediment sample. Selenium is identified as a COPC in sediment.

Thallium was not detected, but the DL (1 mg/kg) was above the BV (0.73 mg/kg) in the sediment sample. Results were compared only to the BV because a background dataset for thallium in sediment is not available. Thallium is identified as a COPC in sediment.

Zinc was detected above the BV (60.2 mg/kg) and above the maximum background concentration of zinc in sediment (56.2 mg/kg) in the sediment sample, at a concentration of 76.7 mg/kg. The box plot for zinc in sediment is presented in Figure F-3.19-8. Zinc is identified as a COPC in sediment.

F-3.19.2 Organic Chemicals at SWMU 01-006(c)

Both samples collected at SWMU 01-006(c) were analyzed for PCBs, SVOCs, and VOCs. Table 6.21-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.21-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.21-3.

F-3.19.2.1 Organic Chemicals in Tuff

One tuff sample from SWMU 01-006(c) was analyzed for PCBs, SVOCs, and VOCs.

Acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, methylene chloride, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene were detected and are identified as COPCs in tuff.

F-3.19.2.2 Organic Chemicals in Sediment

One sediment sample from SWMU 01-006(c) was analyzed for PCBs, SVOCs, and VOCs.

Anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene were detected and are identified as COPCs in tuff.

F-3.19.3 Radionuclides at SWMU 01-006(c)

Both samples collected at SWMU 01-006(c) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.21-1 summarizes the samples collected and the requested analyses for each sample. The sampling locations and detected concentrations are shown in Figure 6.21-4.

Table 6.21-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply.

F-3.19.3.1 Radionuclides in Tuff

One tuff sample from SWMU 01-006(c) was analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected in the tuff sample at a concentration of 0.679 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

F-3.19.3.2 Radionuclides in Sediment

One sediment sample from SWMU 01-006(c) was analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) and above the maximum background concentration of plutonium-239/240 in sediment (0.065 pCi/g) in the sediment sample, at a concentration of 0.492 pCi/g. Plutonium-239/240 is interpreted as being substantially above background and no further evaluation is necessary. Plutonium-239/240 is identified as a COPC in sediment.

F-3.19.4 Summary of COPCs at SWMU 01-006(c)

The inorganic chemicals identified as COPCs at SWMU 01-006(c) are barium, chromium, cobalt, total cyanide, lead, manganese, nickel, nitrate, perchlorate, selenium, thallium, and zinc.

The organic chemicals identified as COPCs at SWMU 01-006(c) are acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, methylene chloride, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene.

The radionuclide identified as a COPC at SWMU 01-006(c) is plutonium-239/240.

F-3.19.5 Nature and Extent of Contamination at SWMU 01-006(c)

F-3.19.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 01-006(c) are barium, chromium, cobalt, total cyanide, lead, manganese, nickel, nitrate, perchlorate, selenium, thallium, and zinc. Sample results are presented in Table 6.21-2 and Figure 6.21-2.

Concentrations of barium, cobalt, lead, manganese, and zinc decrease with depth. Therefore, the vertical extent of barium, cobalt, lead, manganese, and zinc is defined. The lateral extent is also defined for these COPCs by the hillside locations of SWMU 01-007(b), because the lateral extent of these inorganic COPCs is defined at SWMU 01-007(b) (section F-3.27.5.1).

Concentrations of chromium and nickel increase with depth. Therefore, the vertical extent of chromium and nickel is not defined. The lateral extent of chromium and nickel is also not defined (section F-3.27.5.1).

Cyanide, selenium, and thallium were not detected at the site. Therefore, the lateral and vertical extent of cyanide, selenium, and thallium are defined.

Nitrate was detected in one sample at a concentration of 0.34 mg/kg. Nitrate at this concentration is likely naturally occurring. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected in one sample at a concentration near the EDL. Therefore, the lateral and vertical extent of perchlorate are defined.

F-3.19.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 01-006(c) are acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene,

dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, methylene chloride, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene. Sample results are presented in Table 6.21-3 and Figure 6.21-3.

Concentrations of all the organic COPCs increase with depth. Therefore, their vertical extent is not defined. All of these COPCs, except methylene chloride, were not detected at the hillside downslope from SWMU 01-006(c) at SWMU 01-007(b) (section F-3.27.4). Methylene chloride was detected only in one sample at SWMU 01-006(c) at a concentration less than the EQL. Therefore, the lateral extent of these organic COPCs is defined at SWMU 01-006(c).

F-3.19.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPC identified at SWMU 01-006(c) is plutonium-239/240. Sample results are presented in Table 6.21-4 and Figure 6.21-4.

Concentrations of plutonium-239/240 increase slightly with depth. The vertical extent of plutonium-239/240 is not defined. The lateral extent of plutonium-239/240 is defined by the hillside locations of SWMU 01-007(b), because the lateral extent of plutonium-239/240 is defined at SWMU 01-007(b) (section F-3.27.5.3).

F-3.19.5.4 Summary of Nature and Extent at SWMU 01-006(c)

The lateral and vertical extent of all inorganic and radionuclide COPCs are defined at SWMU 01-006(c), except for the lateral and vertical extent of chromium and nickel, and the vertical extent of plutonium-239/240.

The lateral extent of all organic COPCs is defined, but the vertical extent is not defined at SWMU 01-006(c).

F-3.20 SWMU 01-006(d)

Two samples (one tuff and one sediment) were collected during the 2008–2009 investigation from one location at SWMU 01-006(d). Table 6.22-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.22-1 is the site map showing sampling locations.

F-3.20.1 Inorganic Chemicals at SWMU 01-006(d)

Both samples collected at SWMU 01-006(d) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.22-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.22-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.22-2.

F-3.20.1.1 Inorganic Chemicals in Tuff

One tuff sample from SWMU 01-006(d) was analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Total cyanide was not detected, but the DL (0.51 mg/kg) was above the BV (0.5 mg/kg) in the tuff sample. Results were compared only to the BV because a background dataset for total cyanide in tuff is not

available. The DL is essentially equal to the BV. Therefore, cyanide (total) is not identified as a COPC in tuff.

Mercury was detected above the BV (0.1 mg/kg) in the tuff sample at a concentration of 0.122 mg/kg. Results were compared only to the BV because a background dataset for mercury in tuff is not available. Mercury is identified as a COPC in tuff.

F-3.20.1.2 Inorganic Chemicals in Sediment

One sediment sample from SWMU 01-006(d) was analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in sediment (0.03 mg/kg) in the sediment sample at a concentration of 0.122 mg/kg. The box plot for mercury in sediment is presented in Figure F-3.20-1. Mercury is identified as a COPC in sediment.

Selenium was not detected, but had a DL (0.52 mg/kg) above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in sediment (0.1 mg/kg) in the sediment sample. Selenium is identified as a COPC in sediment.

F-3.20.2 Organic Chemicals at SWMU 01-006(d)

Both samples collected at SWMU 01-006(d) were analyzed for PCBs, SVOCs, and VOCs. Table 6.22-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.22-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.22-3.

F-3.20.2.1 Organic Chemicals in Tuff

One tuff sample from SWMU 01-006(d) was analyzed for PCBs, SVOCs, and VOCs.

No organic chemicals were detected in the tuff sample from SWMU 01-006(d). Therefore, no organic COPCs are identified in tuff.

F-3.20.2.2 Organic Chemicals in Sediment

One sediment sample from SWMU 01-006(d) was analyzed for PCBs, SVOCs, and VOCs.

Fluoranthene and pyrene were detected and are identified as COPCs in sediment.

F-3.20.3 Radionuclides at SWMU 01-006(d)

Both samples collected at SWMU 01-006(d) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.22-1 summarizes the samples collected and the requested analyses for each sample.

F-3.20.3.1 Radionuclides in Tuff

One tuff sample from SWMU 01-006(d) was analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

No radionuclides were detected or detected above BVs in tuff at SWMU 01-006(d).

F-3.20.3.2 Radionuclides in Sediment

One sediment sample from SWMU 01-006(d) was analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

No radionuclides were detected or detected above BVs/FVs in sediment at SWMU 01-006(d).

F-3.20.4 Summary of COPCs at SWMU 01-006(d)

The inorganic chemicals identified as COPCs at SWMU 01-006(d) are mercury and selenium.

The organic chemicals identified as COPCs at SWMU 01-006(d) are fluoranthene and pyrene.

No radionuclides are identified as COPCs at SWMU 01-006(d).

F-3.20.5 Nature and Extent of Contamination at SWMU 01-006(d)

F-3.20.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 01-006(d) are mercury and selenium. Sample results are presented in Table 6.22-2 and Figure 6.22-2.

Concentrations of mercury remain the same at location 00-603784 at levels less than twice the BV. The lateral and vertical extent of mercury are defined at SWMU 01-007(b) (section F-3.27.5.1), downslope from SWMU 01-006(d). Therefore, the lateral and vertical extent of mercury are defined at SWMU 01-006(d).

Selenium was not detected at the site. Therefore, the lateral and vertical extent of selenium are defined.

F-3.20.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 01-006(d) are fluoranthene and pyrene. Sample results are presented in Table 6.22-3 and Figure 6.22-3.

Concentrations of fluoranthene and pyrene decrease with depth. Therefore, the lateral and vertical extent are defined.

F-3.20.5.3 Summary of Nature and Extent at SWMU 01-006(d)

The lateral and vertical extent of all inorganic and organic COPCs are defined at SWMU 01-006(d).

F-3.21 AOC 01-006(e)

Six samples (all tuff) were collected during the 2008–2009 investigation from three locations at AOC 01-006(e). Table 6.23-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.23-1 is the site map showing sampling locations.

F-3.21.1 Inorganic Chemicals at AOC 01-006(e)

All six samples collected at AOC 01-006(e) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.23-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.23-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.23-2.

F-3.21.1.1 Inorganic Chemicals in Tuff

Six samples from AOC 01-006(e) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Arsenic was detected above the BV (2.79 mg/kg) in one of six tuff samples, at a concentration of 2.9 mg/kg. The sample concentration is below the maximum background concentration of arsenic in tuff (5 mg/kg). The box plot for arsenic in tuff is presented in Figure F-3.21-1. Arsenic is not identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) and above the maximum background concentration of barium in tuff (51.6 mg/kg) in two of six tuff samples, with concentrations of 69.4 and 106 mg/kg. The box plot for barium in tuff is presented in Figure F-3.21-2. Barium is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in three of six tuff samples, with a maximum concentration of 20.4 mg/kg. One of the three results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). The box plot for chromium in tuff is presented in Figure F-3.21-3. Chromium is identified as a COPC in tuff.

Total cyanide was not detected, but had DLs (0.57–0.61 mg/kg) above the BV (0.5 mg/kg) in three of six tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in one of six tuff samples, at a concentration of 11.2 mg/kg. The box plot for nickel in tuff is presented in Figure F-3.21-4. Nickel is identified as a COPC in tuff.

Selenium was not detected above the BV (0.3 mg/kg) but had DLs (0.57–0.61 mg/kg) above the BV and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in five of six tuff samples. Selenium is identified as a COPC in tuff.

F-3.21.2 Organic Chemicals at AOC 01-006(e)

All six samples collected at AOC 01-006(e) were analyzed for PCBs, SVOCs, and VOCs. Table 6.23-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.23-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.23-3.

F-3.21.2.1 Organic Chemicals in Tuff

Six samples from AOC 01-006(e) were analyzed for PCBs, SVOCs, and VOCs.

Acetone and benzyl alcohol were detected in one or two of the six tuff samples and are identified as COPCs in tuff.

F-3.21.3 Radionuclides at AOC 01-006(e)

All six samples collected at AOC 01-006(e) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.23-1 summarizes the samples collected and the requested analyses for each sample.

F-3.21.3.1 Radionuclides in Tuff

Six tuff sample from AOC 01-006(e) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

No radionuclides were detected or detected above BVs in the tuff samples from AOC 01-006(e). Therefore, no radionuclide COPCs are identified in tuff.

F-3.21.4 Summary of COPCs at AOC 01-006(e)

The inorganic chemicals identified as COPCs at AOC 01-006(e) are barium, chromium, total cyanide, nickel, and selenium.

The organic chemicals identified as COPCs at AOC 01-006(e) are acetone and benzyl alcohol.

No radionuclides are identified as COPCs at AOC 01-006(e).

F-3.21.5 Nature and Extent of Contamination at AOC 01-006(e)

F-3.21.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at AOC 01-006(e) are barium, chromium, total cyanide, nickel, and selenium. Sample results are presented in Table 6.23-2 and are shown in Figure 6.23-2.

Concentrations of barium increase with depth at location 00-603874; concentrations of chromium increase with depth at locations 00-603874 and 00-603876, and concentrations of nickel increase with depth at location 00-603876. No metals were detected above BV's at location 00-603872. Therefore, lateral extent of barium, chromium, and nickel is defined, but the vertical extent is not defined.

Cyanide and selenium were not detected at the site. Therefore, the lateral and vertical extent of cyanide and selenium are defined.

F-3.21.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at AOC 01-006(e) are acetone and benzyl alcohol. Sample results are presented in Table 6.23-3 and Figure 6.23-3.

Acetone and benzyl alcohol were detected in the deeper samples at all three locations sampled at AOC 01-006(e). However, concentrations of acetone are at or below EQLs and benzyl alcohol was

detected only once at 1.8 mg/kg at AOC 01-006(e), and was not detected in the shallower sample or at nearby SWMUs 01-001(t) and 01-007(k). Therefore, the lateral and vertical extent of acetone and benzyl alcohol are defined.

F-3.21.5.3 Summary of Nature and Extent at AOC 01-006(e)

The lateral and vertical extent of all inorganic and organic COPCs are defined at AOC 01-006(e), except for the vertical extent of barium, chromium, and nickel.

F-3.22 AOC 01-006(g)

A total of nine samples (one soil, five tuff, and three sediment) were collected during the 2008–2009 investigation from four locations at AOC 01-006(g). Table 6.24-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.24-1 is the site map showing sampling locations.

F-3.22.1 Inorganic Chemicals at AOC 01-006(g)

All nine samples collected at AOC 01-006(g) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.24-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.24-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.24-2.

F-3.22.1.1 Inorganic Chemicals in Soil

One soil sample from AOC 01-006(g) was analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Nitrate was detected in the soil sample and has no BV. Nitrate is identified as a COPC in soil.

F-3.22.1.2 Inorganic Chemicals in Tuff

Five tuff samples from AOC 01-006(g) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Barium was detected above the BV (46.0 mg/kg) and above the maximum background concentration of barium in tuff (51.6 mg/kg) in one of five tuff samples, at a concentration of 76.5 mg/kg. The box plot for barium in tuff is presented in Figure F-3.22-1. Barium is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in all five tuff samples, with a maximum concentration of 17 mg/kg. Four of the five results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). The box plot for chromium in tuff is presented in Figure F-3.22-2. Chromium is identified as a COPC in tuff.

Total cyanide was not detected, but had DLs (all 0.53 mg/kg) above the BV (0.5 mg/kg) in three of five tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in all five tuff samples, with a maximum concentration of 11.1 mg/kg. Four of the five sample results also exceeded the maximum background concentration of

nickel in tuff (7 mg/kg). The box plot for nickel in tuff is presented in Figure F-3.22-3. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in tuff samples and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was detected above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in one of five tuff samples, at a concentration of 0.31 mg/kg. The box plot for selenium in tuff is presented in Figure F-3.22-4. The sample concentration is essentially equal to the BV. Therefore, selenium is not identified as a COPC in tuff.

F-3.22.1.3 Inorganic Chemicals in Sediment

Three sediment samples from AOC 01-006(g) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Arsenic was detected above the BV (3.98 mg/kg) and above the maximum background concentration of arsenic in sediment (3.6 mg/kg) in two of three sediment samples, with concentrations of 5.2 and 4.9 mg/kg. The box plot for arsenic in sediment is presented in Figure F-3.22-5. Arsenic is identified as a COPC in sediment.

Copper was detected above the BV (11.2 mg/kg) and above the maximum background concentration of copper in sediment (12 mg/kg) in one of three sediment samples, at a concentration of 12.5 mg/kg. The box plot for copper in sediment is presented in Figure F-3.22-6. Copper is identified as a COPC in sediment.

Nitrate and perchlorate were detected in sediment samples and have no BVs. Nitrate and perchlorate are identified as COPCs in sediment.

F-3.22.2 Organic Chemicals at AOC 01-006(g)

All nine samples collected at AOC 01-006(g) were analyzed for PCBs, SVOCs, and VOCs. Table 6.24-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.24-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.24-3.

F-3.22.2.1 Organic Chemicals in Soil

One soil sample from AOC 01-006(g) was analyzed for PCBs, SVOCs, and VOCs.

Methylene chloride was detected and is identified as a COPC in soil.

F-3.22.2.2 Organic Chemicals in Tuff

Five tuff samples from AOC 01-006(g) were analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1260, bis(2-ethylhexyl)phthalate, methylene chloride, and 1,2,4-trimethylbenzene were detected and are identified as COPCs in tuff.

F-3.22.2.3 Organic Chemicals in Sediment

Three sediment samples from AOC 01-006(g) were analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1260, bis(2-ethylhexyl)phthalate, and 1,2,4-trimethylbenzene were detected and are identified as COPCs in sediment.

F-3.22.3 Radionuclides at AOC 01-006(g)

All nine samples collected at AOC 01-006(g) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.24-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.24-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 6.24-4.

F-3.22.3.1 Radionuclides in Soil

One soil sample from AOC 01-006(g) was analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected in the soil sample at a depth where the FV does not apply, at a concentration of 0.577 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

F-3.22.3.2 Radionuclides in Tuff

Five tuff samples from AOC 01-006(g) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected in one of five tuff samples at a concentration of 0.347 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

F-3.22.3.3 Radionuclides in Sediment

Three sediment samples from AOC 01-006(g) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) and above the maximum background concentration of plutonium-239/240 in sediment (0.065 pCi/g) in all three sediment samples, with a maximum concentration of 1.69 pCi/g. Plutonium-239/240 is interpreted as being substantially above background and no further evaluation is necessary. Plutonium-239/240 is identified as a COPC in sediment.

F-3.22.4 Summary of COPCs at AOC 01-006(g)

The inorganic chemicals identified as COPCs at AOC 01-006(g) are arsenic, barium, chromium, copper, total cyanide, nickel, nitrate, and perchlorate.

The organic chemicals identified as COPCs at AOC 01-006(g) are Aroclor-1260, bis(2-ethylhexyl)phthalate, methylene chloride, and 1,2,4-trimethylbenzene.

The only radionuclide identified as a COPC at AOC 01-006(g) is plutonium-239/240.

F-3.22.5 Nature and Extent of Contamination at AOC 01-006(g)

F-3.22.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at AOC 01-006(g) are arsenic, barium, chromium, copper, total cyanide, nickel, nitrate, and perchlorate. Sample results are presented in Table 6.24-2 and Figure 6.24-2.

Concentrations of arsenic and copper decrease with depth. Therefore, the lateral and vertical extent of arsenic and copper are defined.

Barium was detected above BV in only one sample, at the deeper depth at location 00-604050, and the concentration is less than 2 times the maximum background concentration (51.6 mg/kg). Therefore, the lateral and vertical extent of barium are defined.

Concentrations of chromium and nickel increase with depth at all four locations sampled. However, all concentrations are only slightly above the maximum tuff background concentrations of chromium (13 mg/kg) and nickel (7 mg/kg). Therefore, the lateral and vertical extent of chromium and nickel are defined.

Cyanide was not detected at the site. Therefore, the lateral and vertical extent of cyanide are defined.

Concentrations of nitrate decrease with depth. Concentrations of nitrate are less than 5 mg/kg, except for 30.3 mg/kg in the surface sample at location 00-604051. Nitrate was detected at much lower concentrations at the three downslope locations 00-604048, 00-604049, and 00-604050. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected at only two locations, and the concentrations are all at low levels near EDLs. Therefore, the lateral and vertical extent of perchlorate are defined.

F-3.22.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at AOC 01-006(g) are Aroclor-1260, bis(2-ethylhexyl)phthalate, methylene chloride, and 1,2,4-trimethylbenzene. Sample results are presented in Table 6.24-3 and Figure 6.24-3.

Concentrations of Aroclor-1260 and bis(2-ethylhexyl)phthalate decrease with depth. Methylene chloride concentrations remain relatively the same, and 1,2,4-trimethylbenzene concentrations decrease with depth. The majority of concentrations are at or below the EQLs. All organic COPCs were not detected at one or more of the downslope locations 00-604048, 00-604049, and 00-604050, Therefore, the lateral and vertical extent of these COPCs are defined.

F-3.22.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPC identified at AOC 01-006(g) is plutonium-239/240. Sample results are presented in Table 6.24-4 and Figure 6.24-4.

Concentrations of plutonium-239/240 decrease with depth. The lateral extent of plutonium-239/204 is defined by the most downslope location on this hillside, location 00-604046 of SWMU 01-006(a), where it was detected at a lower concentration in the surface sample and it decreases with depth. The lateral and vertical extent of plutonium-239/240 are defined.

F-3.22.5.4 Summary of Nature and Extent at AOC 01-006(g)

The lateral and vertical extent of all inorganic, organic, radionuclide COPCs are defined at AOC 01-006(g).

F-3.23 SWMU 01-006(h)

Identification of COPCs and extent evaluation for SWMU 01-006(h) are the same as those for SWMU 01-001(d) in section F-3.4, because the original location for SWMU 01-006(h) has been built over and it shares the same outfall area of SWMU 01-001(d). Sample results are applicable to both sites.

F-3.24 SWMU 01-006(n)

A total of 10 samples (6 fill and 4 tuff) were collected during the 2008–2009 investigation from four locations at SWMU 01-006(n). Table 6.26-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.26-1 is the site map showing sampling locations.

F-3.24.1 Inorganic Chemicals at SWMU 01-006(n)

All 10 samples collected at SWMU 01-006(n) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.26-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.26-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.26-2.

F-3.24.1.1 Inorganic Chemicals in Soil

Six fill samples from SWMU 01-006(n) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Calcium was detected above the BV (6120 mg/kg) in one of six fill samples, at a concentration of 6220 mg/kg. The sample result is below the maximum background concentration of calcium in soil (14000 mg/kg). The box plot for calcium in soil is presented in Figure F-3.24-1. Calcium is not identified as a COPC in soil.

Total cyanide was not detected above the BV (0.5 mg/kg but had DLs (0.52–0.53 mg/kg) above the BV in three of six fill samples. Results were compared only to the BV because a background dataset for total cyanide in soil is not available. Total cyanide is identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) and above the maximum background concentration of lead in soil(28 mg/kg) in one of six fill samples, at a concentration of 44.1 mg/kg. The box plot for lead in soil is presented in Figure F-3.24-2. Lead is identified as a COPC in soil.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in soil (also 0.1 mg/kg) in four of six fill samples, at a maximum concentration of 0.555 mg/kg. The box plot for mercury in soil is presented in Figure F-3.24-3. Mercury is identified as a COPC in soil.

Nitrate and perchlorate were detected in all six fill samples and have no BVs. Nitrate and perchlorate are identified as COPCs in soil.

Zinc was detected above the BV (48.8 mg/kg) in one of six fill samples, at a concentration of 54.3 mg/kg. This sample result did not exceed the maximum background concentration of zinc in soil (75.5 mg/kg). The box plot for zinc in soil is presented in Figure F-3.24-4. Zinc is not identified as a COPC in soil.

F-3.24.1.2 Inorganic Chemicals in Tuff

Four tuff samples from SWMU 01-006(n) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Antimony was not detected but had DLs (all 0.51 mg/kg) above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in three of four tuff samples. The DLs are essentially equal to the BV. Antimony is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) and above the maximum background concentration of chromium in tuff (13 mg/kg) in one of four tuff samples, at a concentration of 18.9 mg/kg. The box plot for chromium in tuff is presented in Figure F-3.24-5. Chromium is identified as a COPC in tuff.

Total cyanide was not detected above the BV (0.5 mg/kg), but had DLs (both 0.51 mg/kg) above the BV in two of four tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. The DLs are essentially equal to the BV. Total cyanide is not identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in one of four tuff samples, at a concentration of 9.3 mg/kg. The box plot for nickel in tuff is presented in Figure F-3.24-6. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in one or more tuff samples and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was detected above the BV (0.3 mg/kg) in one of four tuff samples, at a concentration of 0.42 mg/kg. Selenium also had DLs (both 0.51 mg/kg) above the BV in two tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). The box plot for selenium in tuff is presented in Figure F-3.24-7. Selenium is identified as a COPC in tuff.

F-3.24.2 Organic Chemicals at SWMU 01-006(n)

All 10 samples collected at SWMU 01-006(n) were analyzed for PCBs, SVOCs, and VOCs. Table 6.26-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.26-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.26-3.

F-3.24.2.1 Organic Chemicals in Soil

Six fill samples from SWMU 01-006(n) were analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, fluoranthene, methylene chloride, phenanthrene, pyrene, and trichlorofluoromethane were detected in one or more fill samples and are identified as COPCs in soil.

F-3.24.2.2 Organic Chemicals in Tuff

Four tuff samples from SWMU 01-006(n) were analyzed for PCBs, SVOCs, and VOCs.

Fluoranthene, methylene chloride, phenanthrene, and pyrene were detected in one or more tuff samples, and are identified as COPCs in tuff.

F-3.24.3 Radionuclides at SWMU 01-006(n)

All 10 samples collected at SWMU 01-006(n) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.26-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.26-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 6.26-4.

F-3.24.3.1 Radionuclides in Soil

Six fill samples from SWMU 01-006(n) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Americium-241 was detected in one of six fill samples at a depth where the FV does not apply, at a concentration of 0.264 pCi/g. Americium-241 is identified as a COPC in soil.

Cesium-134 was detected in one of six fill samples at a depth where the FV does not apply, at a concentration of 0.052 pCi/g. Cesium-134 is identified as a COPC in soil.

Plutonium-239/240 was detected in four of six fill samples at depths where the FV does not apply, with a maximum concentration of 8.22 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

Tritium was detected in one of six fill samples at a concentration of 0.62 pCi/g, and has no soil FV. Tritium is identified as a COPC in soil.

F-3.24.3.2 Radionuclides in Tuff

Four tuff samples from SWMU 01-006(n) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected in all four tuff samples with a maximum concentration of 0.849 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

F-3.24.4 Summary of COPCs at SWMU 01-006(n)

The inorganic chemicals identified as COPCs at SWMU 01-006(n) are chromium, total cyanide, lead, mercury, nickel, nitrate, perchlorate, and selenium.

The organic chemicals identified as COPCs at SWMU 01-006(n) are Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, fluoranthene, methylene chloride, phenanthrene, pyrene, and trichlorofluoromethane.

The radionuclides identified as COPCs at SWMU 01-006(n) are americium-241, cesium-134, plutonium-239/240, and tritium.

F-3.24.5 Nature and Extent of Contamination at SWMU 01-006(n)

F-3.24.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 01-006(n) are chromium, total cyanide, lead, mercury, nickel, nitrate, perchlorate, and selenium. Sample results are presented in Table 6.26-2 and are shown in Figure 6.26-2.

Chromium, lead, nickel, and selenium were detected above BV in only one sample. Concentrations of chromium, nickel, and selenium are slightly above BV or less than twice the maximum tuff background concentration, and the concentration of lead decrease with depth. Therefore, the lateral and vertical extent of chromium, lead, nickel, and selenium are defined.

Cyanide was not detected at the site. Therefore, the lateral and vertical extent of cyanide are defined.

Mercury was detected in four samples at three locations, and concentrations decrease with depth at all locations. Therefore, the lateral and vertical extent of mercury are defined.

Except for one detection of nitrate at 26 mg/kg in the surface sample at location 00-604238, nitrate concentrations are less than 1 mg/kg and likely naturally occurring. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected at two locations. Concentrations decreased with depth at location 00-604238. Perchlorate was detected in the deepest sample at location 00-604229 and the concentration is near the EDL. Perchlorate was not detected in samples from the other two locations (00-604227 and 00-604228) downslope from 00-604238. Therefore, the lateral and vertical extent of perchlorate are defined.

F-3.24.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 01-006(n) are Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, fluoranthene, methylene chloride, phenanthrene, pyrene, and trichlorofluoromethane. Sample results are presented in Table 6.26-3 and are shown in Figure 6.26-3.

Concentrations of all organic COPCs decrease with depth at all locations, except for methylene chloride, which was detected at 0.0046 mg/kg in the deepest sample at location 00-604228. Most of the detections are at concentrations near or below EQLs, except for Aroclor-1260 (0.52 mg/kg) in the surface sample at location 00-604229. The concentration of Aroclor-1260 decreases with depth at that location. The concentration of Aroclor-1260 increases with depth at location 00-604238 (0.17 mg/kg from 4–5 ft bgs). At nearby locations, however, Aroclor-1260 either was not detected (8.25–9.25 ft bgs at location 00-604228) or was detected at a lower concentration (7–8 ft bgs at location 00-604227) in samples from greater depths. Therefore, the lateral and vertical extent of all organic COPCs are defined.

F-3.24.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs identified at SWMU 01-006(n) are americium-241, cesium-134, plutonium-239/240, and tritium. Sample results are presented in Table 6.26-4 and Figure 6.26-4.

Americium-241, cesium-134, and tritium were detected only once, and concentrations decrease with depth. The lateral and vertical extent of these COPCs are defined.

Concentrations of plutonium-239/240 increase with depth at 00-604227 and 00-604228. It was detected at 7.98 pCi/g and 8.22 pCi/g in fill at locations 00-604229 and 00-604238, respectively. The lateral and vertical extent of plutonium-239/240 are not defined.

F-3.24.5.4 Summary of Nature and Extent at SWMU 01-006(n)

The lateral and vertical extent of all inorganic, organic, radionuclide COPCs are defined at SWMU 01-006(n), except for plutonium-239/240.

F-3.25 SWMU 01-006(o)

A total of six samples (all fill) were collected during the 2008–2009 investigation from four locations at SWMU 01-006(o). Table 6.27-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.27-1 is the site map showing sampling locations.

F-3.25.1 Inorganic Chemicals at SWMU 01-006(o)

All six samples collected at SWMU 01-006(o) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.27-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.27-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.27-2.

F-3.25.1.1 Inorganic Chemicals in Soil

Six fill samples from SWMU 01-006(o) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Cyanide (total) was not detected, but has DLs (0.56–0.58 mg/kg) above the BV (0.5 mg/kg) in four of six fill samples. Results were compared only to the BV because a background dataset for total cyanide in soil is not available. Total cyanide is identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) in one of six fill samples, at a concentration of 26 mg/kg. The sample concentration is below the maximum background concentration of lead in soil (28 mg/kg). The box plot for lead in soil is presented in Figure F-3.25-1. Lead is not identified as a COPC in soil.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in soil (also 0.1 mg/kg) in one of six fill samples, at a concentration of 0.103 mg/kg. The sample concentration is essentially equal to the BV. The box plot for mercury in soil is presented in Figure F-3.25-2. Because mercury is detected slightly and infrequently above background (one of six samples), it is not identified as a COPC in soil.

Nitrate was detected in three of six fill samples and has no BV. Nitrate is identified as a COPC in soil.

F-3.25.2 Organic Chemicals at SWMU 01-006(o)

All six samples collected at SWMU 01-006(o) were analyzed for PCBs, SVOCs, and VOCs. Table 6.27-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.27-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.27-3.

F-3.25.2.1 Organic Chemicals in Soil

Six fill samples from SWMU 01-006(o) were analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzyl alcohol, bis(2-ethylhexyl)phthalate, chrysene, fluoranthene, phenanthrene, and pyrene were detected in one or more fill samples and are identified as COPCs in soil.

F-3.25.3 Radionuclides at SWMU 01-006(o)

All six samples collected at SWMU 01-006(o) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.27-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.27-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 6.27-3.

F-3.25.3.1 Radionuclides in Soil

Six fill samples from SWMU 01-006(o) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected in two of six fill samples at depths where the FV does not apply, with concentrations of 0.282 and 0.146 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

Strontium-90 was detected in one of six fill samples at a depth where the FV does not apply, at a concentration of 0.39 pCi/g. Strontium-90 is identified as a COPC in soil.

Tritium was detected in one of six fill samples at a concentration of 1.42 pCi/g, and has no soil FV. Tritium is identified as a COPC in soil.

F-3.25.4 Summary of COPCs at SWMU 01-006(o)

The inorganic chemicals identified as COPCs at SWMU 01-006(o) are total cyanide and nitrate.

The organic chemicals identified as COPCs at SWMU 01-006(n) are Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzyl alcohol, bis(2-ethylhexyl)phthalate, chrysene, fluoranthene, phenanthrene, and pyrene.

The radionuclides identified as COPCs at SWMU 01-006(o) are plutonium-239/240, strontium-90, and tritium.

F-3.25.5 Nature and Extent of Contamination at SWMU 01-006(o)

F-3.25.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 01-006(o) are total cyanide and nitrate. Sample results are presented in Table 6.27-2 and are shown in Figure 6.27-2.

Cyanide was not detected at the site. Therefore, the lateral and vertical extent of cyanide are defined.

Nitrate was detected in three samples at concentrations of 0.093–0.28 mg/kg. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent of nitrate are defined.

F-3.25.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 01-006(o) are Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzyl alcohol, bis(2-ethylhexyl)phthalate, chrysene, fluoranthene, phenanthrene, and pyrene. Sample results are presented in Table 6.27-3 and are shown in Figure 6.27-3.

All organic COPCs, except for Aroclor-1254, were detected in only one sample at low concentrations near or below the EQLs. Aroclor-1254 was detected at 0.47 mg/kg in the deepest sample at location 00-604055. Aroclor-1254 was detected at 0.27 and 0.17 mg/kg in the deeper samples at the two downslope locations 00-603919 and 00-603904 [both at SWMU 01-003(a)]. The vertical extent of Aroclor-1254 is defined by these two locations. Therefore, the lateral and vertical extent of all organic COPCs are defined.

F-3.25.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs identified at SWMU 01-006(o) are plutonium-239/240, strontium-90, and tritium. Sample results are presented in Table 6.27-4 and Figure 6.27-4.

Concentrations of plutonium-239/240 and tritium decrease with depth and were not detected at downslope locations 00-604052, 00-604053, and 00-604054. Therefore, the lateral and vertical extent of plutonium-239/240 and tritium are defined.

Stronium-90 was detected in only one sample at 0.39 pCi/g at location 00-604053. It was not detected at the two downslope locations 00-603919 and 00-603904 [both at SWMU 01-003(a)]. Therefore, the lateral and vertical extent of strontium-90 are defined.

F-3.25.5.3 Summary of Nature and Extent at SWMU 01-006(o)

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined at SWMU 01-006(o).

F-3.26 SWMU 01-007(a)

A total of 26 samples (7 soil and fill, 13 tuff, and 6 sediment) were collected during the 2008–2009 investigation from 11 locations at SWMU 01-007(a). Table 6.28-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.28-1 is the site map showing sampling locations.

F-3.26.1 Inorganic Chemicals at SWMU 01-007(a)

All 26 samples collected at SWMU 01-007(a) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.28-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.28-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.28-2.

F-3.26.1.1 Inorganic Chemicals in Soil

Seven soil and fill samples from SWMU 01-007(a) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Antimony was detected above the BV (0.83 mg/kg) in one of seven soil and fill samples, at a concentration of 0.97 mg/kg. The sample concentration is below the maximum background concentration of antimony in soil (1 mg/kg). The box plot for antimony in soil is presented in Figure F-3.26-1. Antimony is not identified as a COPC in soil.

Calcium was detected above the BV (6120 mg/kg) in two of seven soil and fill samples, with concentrations of 8030 and 21000 mg/kg. One of the two results also exceeded the maximum background concentration of calcium in soil (14,000 mg/kg). The box plot for calcium in soil is presented in Figure F-3.26-2. Calcium is identified as a COPC in soil.

Chromium was detected above the BV (19.3 mg/kg) in two of seven soil and fill samples, with concentrations of 30.9 and 74.7 mg/kg. One of the two results also exceeded the maximum background concentration of chromium in soil (36.5 mg/kg). The box plot for chromium in soil is presented in Figure F-3.26-3. Chromium is identified as a COPC in soil.

Total cyanide was not detected but had DLs (0.51 and 0.58) above the BV (0.5 mg/kg) in two of seven soil and fill samples. Results were compared only to the BV because a background dataset for total cyanide in soil is not available. Total cyanide is identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) in four of seven soil and fill samples, with a maximum concentration of 63.6 mg/kg. Two of the four results also exceeded the maximum background concentration of lead in soil (28 mg/kg). The box plot for lead in soil is presented in Figure F-3.26-4. Lead is identified as a COPC in soil.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in soil (also 0.1 mg/kg) in five of seven soil and fill samples, with a maximum concentration of 2.12 mg/kg. The box plot for mercury in soil is presented in Figure F-3.26-5. Mercury is identified as a COPC in soil.

Nickel was detected above the BV (15.4 mg/kg) and above the maximum background concentration of nickel in soil (29 mg/kg) in one of seven soil and fill samples, at a concentration of 39.5 mg/kg. The box plot for nickel in soil is presented in Figure F-3.26-6. Nickel is identified as a COPC in soil.

Nitrate and perchlorate were detected in soil and fill samples and have no BVs. Nitrate and perchlorate are identified as COPCs in soil.

Zinc was detected above the BV (48.8 mg/kg) in two of seven soil and fill samples, with concentrations of 55.5 and 65.3 mg/kg. Both sample concentrations are below the maximum background concentration for

soil and fill (75.5 mg/kg). The box plot for zinc in soil is presented in Figure F-3.26-7. Zinc is not identified as a COPC in soil.

F-3.26.1.2 Inorganic Chemicals in Tuff

Thirteen tuff (11 Qbt 3 and 2 Qbt 1g) samples from SWMU 01-007(a) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Aluminum was detected above the BV (3560 mg/kg) and above the maximum background concentration of aluminum in Qbt 1g tuff (3400 mg/kg) in the two Qbt 1g tuff samples, with concentrations of 6920 and 9080 mg/kg. The box plot for aluminum in Qbt 1g tuff is presented in Figure F-3.26-8. Aluminum is identified as a COPC in tuff.

Antimony was not detected above the respective BV (both 0.5 mg/kg for Qbt 3 and Qbt 1g) but had DLs (0.54–0.6 mg/kg) above the BV in 2 of 11 Qbt 3 and the two Qbt 1g tuff samples. Statistical tests could not be performed because more than 80% of the combined data (background and site data in Qbt 3) are nondetected values. Antimony is identified as a COPC in tuff.

Arsenic was not detected above the BV (0.56 mg/kg), but had DLs (1 and 0.97 mg/kg) above the BV and above the maximum background concentration of arsenic in Qbt 1g (0.7 mg/kg) in the two Qbt 1g tuff samples. Arsenic is identified as a COPC in tuff.

Beryllium was detected above the BV (1.44 mg/kg) and above the maximum background concentration of beryllium in Qbt 1g tuff (1.4 mg/kg) in the two Qbt 1g tuff samples, with concentrations of 1.7 and 3 mg/kg. The box plot for beryllium in Qbt 1g tuff is presented in Figure F-3.26-9. Beryllium is identified as a COPC in tuff.

Chromium was detected above the respective BV (7.14 mg/kg for Qbt 3 and 2.6 mg/kg for Qbt 1g) in 6 of 11 Qbt 3 and the two Qbt 1g tuff samples, with a maximum concentration of 63.1 mg/kg. Three of the six results from Qbt 3 and the two results from Qbt 1g also exceeded the respective maximum background concentration of chromium in tuff (13 mg/kg for Qbt 3 and 2.3 mg/kg for Qbt 1g). Statistical tests were performed to determine if the site sample results from Qbt 3 for chromium are different than background. The statistical test results are presented in Table F-3.26-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plots for chromium in Qbt 3 and Qbt 1g tuff are presented in Figures F-3.26-10 and F-3.26-11, respectively. Chromium is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 1 of 11 Qbt 3 tuff samples, at a concentration of 5.3 mg/kg. The sample result did not exceed the maximum background concentration of copper in Qbt 3 tuff (6.2 mg/kg). Statistical tests were performed to determine if the site sample results from Qbt 3 for copper are different than background. The statistical test results are presented in Table F-3.26-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for copper in Qbt 3 tuff is presented in Figure F-3.26-12. Copper is identified as a COPC in tuff.

Total cyanide was not detected, but had DLs (0.52–0.6 mg/kg) above the respective BV (both 0.5 mg/kg for Qbt 3 and Qbt 1g) in 9 of 11 Qbt 3 and the two Qbt 1g tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Manganese was detected above the respective BV (482 mg/kg for Qbt 3 and 189 mg/kg for Qbt 1g) in 1 of 11 Qbt 3 and the two Qbt 1g tuff samples, with a maximum concentration of 537 mg/kg. The result from Qbt 3 (537 mg/kg) did not exceed the maximum background concentration of manganese in Qbt 3 tuff (752 mg/kg). The two results from Qbt 1g (257 and 221 mg/kg) exceeded the maximum background concentration of manganese in Qbt 1g tuff (210 mg/kg). Statistical tests were performed to determine if the site sample from Qbt 3 results for manganese are different than background. The statistical test results are presented in Table F-3.26-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for manganese in Qbt 3 and Qbt 1g tuff is presented in Figures F-3.26-13 and F-3.26-14, respectively. Manganese is not identified as a COPC in Qbt 3 tuff, but is identified as a COPC in Qbt 1g tuff. Therefore, manganese is identified as a COPC in tuff.

Nickel was detected above the respective BV (6.58 mg/kg for Qbt 3 and 2 mg/kg for Qbt 1g) in 3 of 11 Qbt 3 and the two Qbt 1g tuff samples, with a maximum concentration of 29.5 mg/kg. All sample results also exceeded the respective maximum background concentration of nickel in tuff (7 mg/kg for Qbt 3 and 2.8 mg/kg for Qbt 1g). Statistical tests were performed to determine if the site sample results from Qbt 3 for nickel are different than background. The statistical test results are presented in Table F-3.26-1. The result of the quantile test indicates that the site sample results are statistically different than background. The box plots for nickel in Qbt 3 and Qbt 1g tuff are presented in Figures F-3.26-15 and F-3.26-16, respectively. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in one or more tuff samples and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was detected above the respective BV (both 0.3 mg/kg in Qbt 3 and Qbt 1g) in 7 of 11 Qbt 3 and the two Qbt 1g tuff samples, with a maximum concentration of 0.41 mg/kg. Selenium also had DLs (0.52–0.6 mg/kg) above the respective BV in two Qbt 3 and one Qbt 1g tuff samples. Results from Qbt 3 were compared only to the BV because the BV is greater than the maximum background concentration of selenium in Qbt 3 tuff (0.105 mg/kg). Statistical tests were not performed because the background data of selenium in Qbt 2,3,4 tuff are all nondetects. A background dataset for selenium in Qbt 1g is not available. The box plot for selenium in Qbt 3 tuff is presented in Figure F-3.26-17. Selenium is identified as a COPC in tuff.

F-3.26.1.3 Inorganic Chemicals in Sediment

Six sediment samples from SWMU 01-007(a) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Beryllium was detected above the BV (1.31 mg/kg) and above the maximum background concentration of beryllium in sediment (1.3 mg/kg) in one of six sediment samples, at a concentration of 1.9 mg/kg. The box plot for beryllium in sediment is presented in Figure F-3.26-18. Beryllium is identified as a COPC in sediment.

Lead was detected above the BV (19.7 mg/kg) and above the maximum background concentration of lead in sediment (25.6 mg/kg) in one of six sediment samples, at a concentration of 49.9 mg/kg. The box plot for lead in sediment is presented in Figure F-3.26-19. Lead is identified as a COPC in sediment.

Nitrate was detected in three of six sediment samples and has no BV. Nitrate is identified as a COPC in sediment.

Selenium was detected above the BV (0.3 mg/kg) in one of six sediment samples, at a concentration of 0.31 mg/kg. Selenium also had DLs (0.51 and 0.55 mg/kg) above the BV in two sediment samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in sediment (0.1 mg/kg). The box plot for selenium in sediment is presented in Figure F-3.26-20. Selenium is identified as a COPC in sediment.

Thallium was not detected above the BV (0.73 mg/kg), but had a DL (0.86 mg/kg) above the BV in one of six sediment samples. The DL is less than 20% above the BV. Results were compared only to the BV because a background dataset for thallium in sediment is not available. Because thallium has only a DL that is slightly and infrequently above background (one of six samples), it is not identified as a COPC in sediment.

Zinc was detected above the BV (60.2 mg/kg) and above the maximum background concentration of zinc in sediment (56.2 mg/kg) in one of six sediment samples, at a concentration of 69.1 mg/kg. The sample concentration was less than 20% above the BV. The box plot for zinc in sediment is presented in Figure F-3.26-21. Because zinc was detected only slightly and infrequently (one of six samples) above background, it is not identified as a COPC in sediment.

F-3.26.2 Organic Chemicals at SWMU 01-007(a)

All 26 samples collected at SWMU 01-007(a) were analyzed for PCBs, SVOCs, and VOCs. Table 6.28-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.25-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.28-3.

F-3.26.2.1 Organic Chemicals in Soil

Seven soil and fill samples from SWMU 01-007(a) were analyzed for PCBs, SVOCs, and VOCs.

Acenaphthylene, anthracene, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, di-n-butylphthalate, fluoranthene, methylene chloride, phenanthrene, pyrene, and trichlorofluoromethane were detected in one or more soil and fill samples, and are identified as COPCs in soil and fill.

F-3.26.2.2 Organic Chemicals in Tuff

Thirteen tuff samples from SWMU 01-007(a) were analyzed for PCBs, SVOCs, and VOCs.

Benzene, benzyl alcohol, bis(2-ethylhexyl)phthalate, tert-butylbenzene, isopropylbenzene, methylene chloride, and trichlorofluoromethane were detected in one or more tuff samples and are identified as COPCs in tuff.

F-3.26.2.3 Organic Chemicals in Sediment

Six sediment samples from SWMU 01-007(a) were analyzed for PCBs, SVOCs, and VOCs.

Acetone, Aroclor-1254, Aroclor-1260, bis(2-ethylhexyl)phthalate, 4-chlorotoluene, 4-isopropyltoluene, tetrachloroethene, and xylene (total) were detected in one or more sediment samples and are identified as COPCs in sediment.

F-3.26.3 Radionuclides at SWMU 01-007(a)

All 26 samples collected at SWMU 01-007(a) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.28-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.28-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 6.28-4.

F-3.26.3.1 Radionuclides in Soil

Seven soil and fill samples from SWMU 01-007(a) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Americium-241 was detected in three soil and fill samples at depths where the FV does not apply, with a maximum concentration of 0.197 pCi/g. Americium-241 is identified as a COPC in soil.

Cesium-137 was detected in one soil sample at a depth where the FV does not apply, at a concentration of 0.323 pCi/g. Cesium-137 is identified as a COPC in soil.

Plutonium-239/240 was detected in all seven soil and fill samples at depths where the FV does not apply, with a maximum concentration of 11.3 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

Tritium was detected in three of seven soil and fill samples with a maximum concentration of 2.08 pCi/g, and has no soil FV. Tritium is identified as a COPC in soil.

F-3.26.3.2 Radionuclides in Tuff

Thirteen tuff samples from SWMU 01-007(a) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Americium-241 was detected in 2 of 13 tuff samples with concentrations of 0.125 and 0.121 pCi/g, and has no tuff FV. Americium-241 is identified as a COPC in tuff.

Plutonium-238 was detected in 2 of 13 tuff samples with concentrations of 0.112 and 0.063 pCi/g, and has no tuff FV. Plutonium-238 is identified as a COPC in tuff.

Plutonium-239/240 was detected in all 13 tuff samples with a maximum concentration of 20 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

Tritium was detected in 1 of 13 tuff samples at a concentration of 1.72 pCi/g, and has no tuff FV. Tritium is identified as a COPC in tuff.

F-3.26.3.3 Radionuclides in Sediment

Six sediment samples from SWMU 01-007(a) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Americium-241 was detected above the FV (0.040 pCi/g) and above the maximum background concentration of americium-241 in sediment (0.038 pCi/g) in three of six sediment samples, with a

maximum concentration of 1.05 pCi/g. The box plot for americium-241 in sediment is presented in Figure F-3.26-22. Americium-241 is identified as a COPC in sediment.

Plutonium-238 was detected above the FV (0.006 pCi/g) and above the maximum background concentration of plutonium-238 in sediment (also 0.006 pCi/g) in two of six sediment samples, with concentrations of 0.141 and 0.053 pCi/g. The box plot for plutonium-238 in sediment is presented in Figure F-3.26-23. Plutonium-238 is identified as a COPC in sediment.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) and above the maximum background concentration of plutonium-239/240 in sediment (0.065 pCi/g) in all six sediment samples, with a maximum concentration of 190 pCi/g. Plutonium-239/240 is interpreted as being substantially above background and no further evaluation is necessary. Plutonium-239/240 is identified as a COPC in sediment.

F-3.26.4 Summary of COPCs at SWMU 01-007(a)

The inorganic chemicals identified as COPCs at SWMU 01-007(a) are aluminum, antimony, arsenic, beryllium, calcium, chromium, copper, total cyanide, lead, manganese, mercury, nickel, nitrate, perchlorate, and selenium.

The organic chemicals identified as COPCs at SWMU 01-007(a) are acenaphthylene, acetone, anthracene, Aroclor-1254, Aroclor-1260, benzene, benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, benzyl alcohol, bis(2-ethylhexyl)phthalate, tert-butylbenzene, 4-chlorotoluene, chrysene, di-n-butylphthalate, fluoranthene, isopropylbenzene, 4-isopropyltoluene, methylene chloride, phenanthrene, pyrene, tetrachloroethene, trichlorofluoromethane, and xylene (total).

The radionuclides identified as COPCs at SWMU 01-007(a) are americium-241, cesium-137, plutonium-238, plutonium-239/240, and tritium.

F-3.26.5 Nature and Extent of Contamination at SWMU 01-007(a)

F-3.26.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs at SWMU 01-007(a) are aluminum, antimony, arsenic, beryllium, calcium, chromium, copper, total cyanide, lead, manganese, mercury, nickel, nitrate, perchlorate, and selenium. Sample results are presented in Table 6.28-2 and Figure 6.28-2.

Aluminum was detected above its BV in 2 of 26 samples. Both sample concentrations were less than 3 times the BV. Therefore, the lateral and vertical extent of aluminum are defined.

Antimony was detected above the BV in only one sample and the concentration decreased with depth. Therefore, the lateral and vertical extent of antimony are defined.

Arsenic, and cyanide were not detected at the site. Therefore, the lateral and vertical extent of antimony, arsenic, and cyanide are defined.

Beryllium was detected above its BV in 3 of 26 samples. It increases slightly with depth at location 00-604236 and was detected above the BV only in the deeper sample at location 00-604235. The sample concentrations are only slightly more than twice the BV. Therefore, the lateral and vertical extent of beryllium are defined.

Calcium and copper were detected at only one location with the concentrations for both of them decreased with depth. They were not detected above the BV at other locations on mesa top or on canyon slope. Therefore, the lateral and vertical extent of calcium and copper are defined.

Chromium was detected above its BV in 10 of 26 samples. At two locations (00-604240 and 00-604233), chromium was detected above the BV only in the deeper sample at concentrations 4 to 5 times the maximum background concentration. Therefore, the vertical extent of chromium is not defined.

Lead was detected above its BV in 5 of 26 samples. The concentration of lead decrease with depth at all three locations where it was detected above BV. The highest concentrations of lead were detected at locations 00-604239 and 00-604240 in the mesa-top portion of the site, and concentrations decrease downslope. Therefore, the lateral and vertical extent of lead are defined.

Manganese was detected above its BV in 3 of 26 samples. One sample concentration (537 mg/kg in Qbt 3 at location 00-604233) is below the maximum background concentration, and the other two are only slightly above the maximum background concentration for Qbt 1g. The concentrations of manganese decrease downslope. Therefore, the lateral and vertical extent of manganese are defined.

Mercury was detected above its BV in 5 of 26 samples. The concentrations of mercury decrease with depth at all three locations where it was detected above BV. The concentrations are highest on the mesa top (location 00-604239 and 00-604230) and decrease to below background on the canyon slope. Therefore, the lateral and vertical extent of mercury are defined.

Nickel was detected in 6 of 26 samples. The nickel concentration at location 00-604240 increases with depth to 29.5 mg/kg (more than 4 times the maximum background concentration) at 14–15 ft bgs. Nickel also increases with depth to more than 3 times the maximum background concentration at location 00-604233. Therefore, the vertical extent of nickel is not defined.

Nitrate was detected in multiple samples at concentrations of 0.15–3.8 mg/kg, which are likely naturally occurring, across the site except at location 00-604239. At location 00604239, nitrate concentrations, ranging from 6.9–9.1 mg/kg, decreased with depth. Nitrate concentrations also decreased laterally on mesa top and on the slope. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected at two locations and concentrations decreased with depth. Perchlorate was not detected in samples from downslope locations. Therefore, the lateral and vertical extent of perchlorate are defined.

Selenium was detected above its BV in 7 of 26 samples. All detected sample concentrations of selenium are less than twice the BV. The lateral and vertical extent of selenium are defined.

F-3.26.5.2 Nature and Extent of Organic COPCs

The organic COPCs at SWMU 01-007(a) are acenaphthylene, acetone, anthracene, Aroclor-1254, Aroclor-1260, benzene, benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, benzyl alcohol, bis(2-ethylhexyl)phthalate, tert-butylbenzene, 4-chlorotoluene, chrysene, di-n-butylphthalate, fluoranthene, isopropylbenzene, 4-isopropyltoluene, methylene chloride, phenanthrene, pyrene, tetrachloroethene, trichlorofluoromethane, and xylene (total). Sample results are presented in Table 6.28-3 and Figure 6.28-3.

PAHs were detected at one or two locations (00-604239 and 00-604240), and concentrations decrease with depth at both locations. Therefore, the lateral and vertical extent of PAHs are defined.

Aroclor-1254 was detected at only one location (00-604233), and decreases with depth. Therefore, the lateral and vertical extent of Aroclor-1254 are defined.

Aroclor-1260 was detected in nine samples at six locations. Concentrations decrease with depth at all locations where it was detected. Aroclor-1260 was not detected at the three locations farthest downslope from the mesa top. Therefore, the lateral and vertical extent of Aroclor-1260 are defined.

All VOCs were detected in only one or two samples, except methylene chloride, which was detected in five samples. Concentrations decrease with depth, except for tert-butylbenzene, methylene chloride, and trichlorofluoromethane, which do not change substantially with depth at one location. All VOC concentrations are at or below the EQLs. Therefore, the lateral and vertical extent of all VOCs are defined.

Benzyl alcohol was detected in only one sample, at a low concentration (0.036 mg/kg). Therefore, the lateral and vertical extent of benzyl alcohol are defined.

Bis(2-ethylhexyl)phthalate was detected in 10 samples. Its concentration increases with depth or it was detected only in the bottom sample at five locations, including the farthest downslope location (00-604236). Therefore, the lateral and vertical extent of bis(2-ethylhexyl)phthalate are not defined.

Di-n-butylphthalate was detected in only one sample, and decreases with depth. Therefore, the lateral and vertical extent of di-n-butylphthalate are defined.

F-3.26.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs at SWMU 01-007(a) are americium-241, cesium-137, plutonium-238, plutonium-239/240, and tritium. Sample results are presented in Table 6.28-4 and Figure 6.28-4.

Americium-241 was detected above its FV or was detected in 8 of 26 samples. Concentrations of americium-241 decrease with depth. Americium-241 was not detected at the three locations farthest downslope from the mesa top. Therefore, the lateral and vertical extent of americium-241 are defined.

Cesium-137 was detected in one soil sample for which the FV does not apply, and decreases with depth. Therefore, the lateral and vertical extent of cesium-137 are defined.

Plutonium-238 was detected above its FV or was detected in 4 of 26 samples. Concentrations decrease with depth. Plutonium-238 is below its FV or was not detected at the two locations farthest downslope. Therefore, the lateral and vertical extent of plutonium-238 are defined.

Plutonium-239/240 was detected above its FV or was detected in 23 of 26 samples. Concentrations decrease with depth at all locations and concentrations decrease downslope. Therefore, the lateral and vertical extent of plutonium-239/240 are defined.

Tritium was detected in four samples for which no FV applies. All detections of tritium are at location 00-604239. The concentration of tritium decreases with depth in the three deepest samples. Therefore, the lateral and vertical extent of tritium are defined.

F-3.26.5.4 Summary of Nature and Extent at SWMU 01-007(a)

The lateral and vertical extent of all inorganic COPCs are defined, except for the vertical extent of chromium and nickel.

The lateral and vertical extent of all organic COPCs are defined, except for bis(2-ethylhexyl)phthalate.

The lateral and vertical extent of all radionuclide COPCs are defined.

F-3.27 SWMU 01-007(b)

A total of 32 samples (1 soil, 20 tuff, and 11 sediment) were collected during the 2008–2009 investigation from 16 locations at SWMU 01-007(b). Table 6.29-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.29-1 is the site map showing sampling locations.

F-3.27.1 Inorganic Chemicals at SWMU 01-007(b)

All 32 samples collected at SWMU 01-007(b) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.29-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.29-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.29-2.

F-3.27.1.1 Inorganic Chemicals in Soil

One soil sample from SWMU 01-007(b) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

No inorganic chemicals were detected or have DLs above BVs in the soil sample. Therefore, no inorganic chemicals are identified as COPCs in soil.

F-3.27.1.2 Inorganic Chemicals in Tuff

Twenty tuff samples from SWMU 01-007(b) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Aluminum was detected above the BV (7340 mg/kg) and above the maximum background concentration of aluminum in tuff (8370 mg/kg) in 1 of 20 tuff samples, at a concentration of 8450 mg/kg. Statistical tests were performed to determine if the site sample results for aluminum are different than background. The statistical test results are presented in Table F-3.27-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for aluminum in tuff is presented in Figure F-3.27-1. Aluminum is identified as a COPC in tuff.

Antimony was not detected above the BV (0.5 mg/kg), but had DLs (both 0.52 mg/kg) above the BV and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in 2 of 20 tuff samples. The DLs were 4% above the BV. Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetected values. Because antimony has only DLs that are slightly and infrequently above background (2 of 20 samples), it is not identified as a COPC in tuff.

Arsenic was detected above the BV (2.79 mg/kg) in 1 of 20 tuff samples, at a concentration of 3.6 mg/kg. The result did not exceed the maximum background concentration of arsenic in tuff (5 mg/kg). Statistical tests were performed to determine if the site sample results for arsenic are different than background. The statistical test results are presented in Table F-3.27-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for arsenic in tuff is presented in Figure F-3.27-2. Arsenic is not identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) and above the maximum background concentration of barium in tuff (51.6 mg/kg) in 2 of 20 tuff samples, with concentrations of 2480 and 66.6 mg/kg. Statistical tests were performed to determine if the site sample results for barium are different than background. The statistical test results are presented in Table F-3.27-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for barium in tuff is presented in Figure F-3.27-3. Barium is not identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in 1 of 20 tuff samples, at a concentration of 1.3 mg/kg. The sample result did not exceed the maximum background concentration of beryllium in tuff (1.8 mg/kg). Statistical tests were performed to determine if the site sample results for beryllium are different than background. The statistical test results are presented in Table F-3.27-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for beryllium in tuff is presented in Figure F-3.27-4. Beryllium is not identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum background concentration of calcium in tuff (2230 mg/kg) in 1 of 20 tuff samples, at a concentration of 7860 mg/kg. Statistical tests were performed to determine if the site sample results for calcium are different than background. The statistical test results are presented in Table F-3.27-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for calcium in tuff is presented in Figure F-3.27-5. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 7 of 20 tuff samples, with a maximum concentration of 25.4 mg/kg. Four of the seven results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). Statistical tests were performed to determine if the site sample results for chromium are different than background. The statistical test results are presented in Table F-3.27-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for chromium in tuff is presented in Figure F-3.27-6. Chromium is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 3 of 20 tuff samples, with a maximum concentration of 9.6 mg/kg. One of the three results also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). Statistical tests were performed to determine if the site sample results for copper are different than background. The statistical test results are presented in Table F-3.27-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for copper in tuff is presented in Figure F-3.27-7. Copper is identified as a COPC in tuff.

Total cyanide was not detected above the BV (0.5 mg/kg), but had DLs (0.51–0.53 mg/kg) above the BV in 8 of 20 tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 2 of 20 tuff samples, with concentrations of 13.2 and 16.4 mg/kg. One of the two results also exceeded the maximum background concentration of lead in tuff (15.5 mg/kg). Statistical tests were performed to determine if the site sample results for lead are different than background. The statistical test results are presented in Table F-3.27-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for lead in tuff is presented in Figure F-3.27-8. Lead is not identified as a COPC in tuff.

Magnesium was detected above the BV (1690 mg/kg) in 1 of 20 tuff samples, at a concentration of 2180 mg/kg. The sample result did not exceed the maximum background concentration of magnesium in

tuff (2820 mg/kg). Statistical tests were performed to determine if the site sample results for magnesium are different than background. The statistical test results are presented in Table F-3.27-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for magnesium in tuff is presented in Figure F-3.27-9. Magnesium is not identified as a COPC in tuff.

Manganese was detected above the BV (482 mg/kg) and above the maximum background concentration of manganese in tuff (752 mg/kg) in 1 of 20 tuff samples, at a concentration of 766 mg/kg. Statistical tests were performed to determine if the site sample results for manganese are different than background. The statistical test results are presented in Table F-3.27-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for manganese in tuff is presented in Figure F-3.27-10. Manganese is not identified as a COPC in tuff.

Mercury was detected above the BV (0.1 mg/kg) in 1 of 20 tuff samples, at a concentration of 0.351 mg/kg. Results were compared only to the BV because a background dataset for mercury in tuff is not available. Mercury is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in 6 of 20 tuff samples, with a maximum concentration of 15.9 mg/kg. Statistical tests were performed to determine if the site sample results for nickel are different than background. The statistical test results are presented in Table F-3.27-1. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for nickel in tuff is presented in Figure F-3.27-11. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in one or more tuff samples and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was detected above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in 9 of 20 tuff samples, with a maximum concentration of 1.6 mg/kg. Selenium also had a DL (1.4 mg/kg) above the BV in one tuff sample. Statistical tests were not performed because the background data of selenium in Qbt 2,3,4 tuff are all nondetects. The box plot for selenium in tuff is presented in Figure F-3.27-12. Selenium is identified as a COPC in tuff.

F-3.27.1.3 Inorganic Chemicals in Sediment

Eleven sediment samples from SWMU 01-007(b) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Lead was detected above the BV (19.7 mg/kg) in 1 of 11 sediment samples, at a concentration of 22.7 mg/kg. The sample result did not exceed the maximum background concentration of lead in sediment (25.6 mg/kg). Statistical tests were performed to determine if the site sample results for lead are different than background. The statistical test results are presented in Table F-3.27-2. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for lead in sediment is presented in Figure F-3.27-13. Lead is not identified as a COPC in sediment.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in sediment (0.03 mg/kg) in 2 of 11 sediment samples, with concentrations of 0.206 and 0.203 mg/kg. Statistical tests were performed to determine if the site sample results for mercury are different than background. The statistical test results are presented in Table F-3.27-2. The result of the

quantile test indicates that the site sample results are statistically different than background. The box plot for mercury in sediment is presented in Figure F-3.27-14. Mercury is identified as a COPC in sediment.

Nitrate was detected in 5 of 11 sediment samples and has no BV. Nitrate is identified as a COPC in sediment.

Selenium was detected above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in sediment (0.1 mg/kg) in 3 of 11 sediment samples, with a maximum concentration of 0.41 mg/kg. Selenium also had DLs (0.52 and 0.55 mg/kg) above the BV in two sediment samples. Statistical tests were not performed because the background data of selenium in sediment are all nondetects. The box plot for selenium in sediment is presented in Figure F-3.27-15. Selenium is identified as a COPC in sediment.

F-3.27.2 Organic Chemicals at SWMU 01-007(b)

All 32 samples collected at SWMU 01-007(b) were analyzed for PCBs, SVOCs, and VOCs. Table 6.29-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.29-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.29-3.

F-3.27.2.1 Organic Chemicals in Soil

One soil sample from SWMU 01-007(b) was analyzed for PCBs, SVOCs, and VOCs.

No organic chemicals were detected in the soil sample. Therefore, no organic chemicals are identified as COPCs in soil.

F-3.27.2.2 Organic Chemicals in Tuff

Twenty tuff samples from SWMU 01-007(b) were analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1260, bis(2-ethylhexyl)phthalate, chloromethane, di-n-butylphthalate, isopropylbenzene, 4-isopropyltoluene, methylene chloride, and trichlorofluoromethane were detected in one or more tuff samples and are identified as COPCs in tuff.

F-3.27.2.3 Organic Chemicals in Sediment

Eleven sediment samples from SWMU 01-007(b) were analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1260, bis(2-ethylhexyl)phthalate, methylene chloride, toluene, and 1,2,4-trimethylbenzene were detected in one or more sediment samples and are identified as COPCs in sediment.

F-3.27.3 Radionuclides at SWMU 01-007(b)

All 32 samples collected at SWMU 01-007(b) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.29-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.29-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 6.29-4.

F-3.27.3.1 Radionuclides in Soil

One soil sample from SWMU 01-007(b) was analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Cesium-137 was detected in the soil sample at a depth where the FV does not apply, at a concentration of 0.321 pCi/g. Cesium-137 is identified as a COPC in soil.

Plutonium-239/240 was detected in the soil sample at a depth where the FV does not apply, at a concentration of 3.5 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

F-3.27.3.2 Radionuclides in Tuff

Twenty tuff samples from SWMU 01-007(b) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Americium-241 was detected in 2 of 20 tuff samples with concentrations of 2.64 and 0.123 pCi/g, and has no tuff FV. Americium-241 is identified as a COPC in tuff.

Plutonium-239/240 was detected in 10 of 20 tuff samples with a maximum concentration of 242 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

Uranium-234 was detected above the BV (1.98 pCi/g) in 1 of 20 tuff samples, at a concentration of 5.1 pCi/g. Results were compared only to the BV because background dataset for uranium-234 in tuff is not available. Uranium-234 is identified as a COPC in tuff.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in 1 of 20 tuff samples, at a concentration of 0.265 pCi/g. Results were compared only to the BV because background dataset for uranium-235/236 in tuff is not available. Uranium-235/236 is identified as a COPC in tuff.

Uranium-238 was detected above the BV (1.93 pCi/g) in 1 of 20 tuff samples, at a concentration of 4.28 pCi/g. Results were compared only to the BV because background dataset for uranium-238 in tuff is not available. Uranium-238 is identified as a COPC in tuff.

F-3.27.3.3 Radionuclides in Sediment

Eleven sediment samples from SWMU 01-007(b) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Americium-241 was detected above the FV (0.040 pCi/g) and above the maximum background concentration of americium-241 in sediment (0.038 pCi/g) in 4 of 11 sediment samples, with a maximum concentration of 0.62 pCi/g. Statistical tests were performed to determine if the site sample results for americium-241 are different than background. The statistical test results are presented in Table F-3.27-3. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for americium-241 in sediment is presented in Figure F-3.27-15. Americium-241 is not identified as a COPC in sediment.

Plutonium-238 was detected above the FV (0.006 pCi/g) and above the maximum background concentration of plutonium-238 in sediment (also 0.006 pCi/g) in 1 of 11 sediment samples, at a concentration of 0.102 pCi/g. Statistical tests were performed to determine if the site sample results for plutonium-238 are different than background. The statistical test results are presented in Table F-3.27-3. The results of both the quantile test and the Slippage test indicate that the site sample results are not statistically different than background. The box plot for plutonium-238 in sediment is presented in Figure F-3.27-16. Plutonium-238 is not identified as a COPC in sediment.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) and above the maximum background concentration of plutonium-239/240 in sediment (0.065 pCi/g) in 10 of 11 sediment samples, with a maximum concentration of 54.9 pCi/g. Plutonium-239/240 is interpreted as being substantially above background and no further evaluation is necessary. Plutonium-239/240 is identified as a COPC in sediment.

F-3.27.4 Summary of COPCs at SWMU 01-007(b)

The inorganic chemicals identified as COPCs at SWMU 01-007(b) are aluminum, chromium, copper, total cyanide, mercury, nickel, nitrate, perchlorate, and selenium.

The organic chemicals identified as COPCs at SWMU 01-007(b) are Aroclor-1260, bis(2-ethylhexyl)phthalate, chloromethane, di-n-butylphthalate, isopropylbenzene, 4-isopropyltoluene, methylene chloride, toluene, trichlorofluoromethane, and 1,2,4-trimethylbenzene.

The radionuclide COPCs identified at SWMU 01-007(b) are americium-241, cesium-137, plutonium-239/240, uranium-234, uranium-235/236, and uranium-238.

F-3.27.5 Nature and Extent of Contamination at SWMU 01-007(b)

F-3.27.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs at SWMU 01-007(b) are aluminum, chromium, copper, total cyanide, mercury, nickel, nitrate, perchlorate, and selenium. Sample results are presented in Table 6.29-2 and Figure 6.29-2.

Aluminum was detected at only one location with concentrations decreased with depth. Aluminum was not detected above the BV at any other location on mesa top or on canyon slope. Therefore, the lateral and vertical extent of aluminum are defined.

Chromium was detected above its BV in seven samples from seven locations. Chromium was detected above its BV in the deepest sample at six of those seven locations, but all concentrations are less than twice the maximum background concentration. The concentration increase at location 00-603796, one of the farthest downslope locations. Therefore, the lateral and vertical extent of chromium are not defined.

Copper was detected above its BV in three samples at two locations, and concentrations decrease with depth. Both locations are at the upper part of the canyon slope, and concentrations decrease downslope. Therefore, the lateral and vertical extent of copper are defined.

Cyanide was not detected at the site. Therefore, the lateral and vertical extent of cyanide are defined.

Mercury was detected above its BV in three samples at three locations. Mercury concentrations decrease with depth at all three locations. Mercury was not detected above its BV at locations downslope of these three locations. Therefore, the lateral and vertical extent of mercury are defined.

Nickel was detected above its BV in six samples at five locations. Nickel was detected above the BV only in the deeper samples at four locations, and its concentration increases with depth at location 00-603782. Nickel concentrations increase downslope. Therefore, the lateral and vertical extent of nickel are not defined.

Nitrate was detected in ten samples at concentrations 0.085–1.3 mg/kg. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected only in the deepest sample at location 00-603792. Perchlorate was not detected in samples from similar depths at other locations. Therefore, the lateral and vertical extent of perchlorate are defined.

Selenium was detected above its BV in 12 samples, and has DLs above its BV in another three samples. The concentration of selenium increases with depth or is above the BV only in the deeper sample, at five locations. The deepest sample at location 00-603797 has a selenium concentration (0.96 mg/kg) more than 3 times the BV. Selenium concentrations increase downslope. Therefore, the lateral and vertical extent of selenium are not defined.

F-3.27.5.2 Nature and Extent of Organic COPCs

The organic COPCs at SWMU 01-007(b) are Aroclor-1260, bis(2-ethylhexyl)phthalate, chloromethane, di-n-butylphthalate, isopropylbenzene, 4-isopropyltoluene, methylene chloride, toluene, trichlorofluoromethane, and 1,2,4-trimethylbenzene. Sample results are presented in Table 6.29-3 and are shown in Figure 6.29-3.

Aroclor-1260 was detected in six samples, and decreases with depth at all locations. Aroclor-1260 was not detected at the locations farthest downslope from the mesa top. Therefore, the lateral and vertical extent of Aroclor-1260 are defined.

Bis(2-ethylhexyl)phthalate was detected in three samples. The maximum concentration (0.47 mg/kg) was detected in the deeper sample at location 00-603782. Concentrations decrease downslope. Therefore, the lateral extent is defined, but the vertical extent is not defined for bis(2-ethylhexyl)phthalate.

Di-n-butylphthalate was detected in only two samples, at low concentrations. Concentrations decrease with depth at one location, and are below the EQL at both locations. Therefore, the lateral and vertical extent of di-n-butylphthalate are defined.

Chloromethane, isopropylbenzene, 4-isopropyltoluene, methylene chloride, toluene, trichlorofluoromethane, and 1,2,4-trimethylbenzene were each detected in one to three samples. Concentrations are below the EQLs for all these organic COPCs. Therefore, the lateral and vertical extent of VOCs are defined.

F-3.27.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs at SWMU 01-007(b) are americium-241, cesium-137, plutonium-239/240, uranium-234, uranium-235/236, and uranium-238. Sample results are presented in Table 6.29-4 and are shown in Figure 6.29-4.

Americium-241 was detected in six samples at five locations, and decreases with depth at all five locations. Concentrations of americium-241 decrease in the downslope direction. Therefore, the lateral and vertical extent of americium-241 are defined.

Cesium-137 was detected in only one sample, and decreases with depth. Therefore, the lateral and vertical extent of cesium-137 are defined.

Plutonium-239/240 was detected in 21 samples from 12 locations. The concentrations of plutonium-239/240 decrease with depth at all 12 locations. Surface concentrations of plutonium-239/240 decrease downslope. Therefore, the lateral and vertical extent of plutonium-239/240 are defined.

Uranium-235, uranium-235/236, and uranium-238 were each detected above their BVs in only one sample (all at location 00-603785), and decrease with depth. No uranium isotopes were detected above BVs at any locations downslope of 00-603785. Therefore, the lateral and vertical extent of uranium-235, uranium-235/236, and uranium-238 are defined.

F-3.27.5.4 Summary of Nature and Extent at SWMU 01-007(b)

The lateral and vertical extent of all inorganic COPCs are defined, except for chromium, nickel, and selenium.

The lateral and vertical extent are defined for all organic COPCs except bis(2-ethylhexyl)phthalate. The vertical extent of bis(2-ethylhexyl)phthalate is not defined.

The lateral and vertical extent of all radionuclide COPCs are defined.

F-3.28 SWMU 01-007(c)

Eight samples (all tuff) were collected during the 2008–2009 investigation from four locations at SWMU 01-007(c). Table 6.30-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.30-1 is the site map showing sampling locations.

F-3.28.1 Inorganic Chemicals at SWMU 01-007(c)

All eight samples collected at SWMU 01-007(c) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.30-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.30-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.30-2.

F-3.28.1.1 Inorganic Chemicals in Tuff

Eight tuff samples from SWMU 01-007(c) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Antimony was not detected above the BV (0.5 mg/kg), but had DLs (0.53 and 0.54 mg/kg) above the BV and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in two of eight tuff samples. The DLs are less than 10% above the BV. Because antimony only has DLs that are slightly and infrequently above background (two of eight samples), it is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in six of eight tuff samples, with a maximum concentration of 28.8 mg/kg. Three of the six results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). The box plot for chromium in tuff is presented in Figure F-3.28-1. Chromium is identified as a COPC in tuff.

Total cyanide was not detected above the BV (0.5 mg/kg), but had DLs (0.53–0.6 mg/kg) above the BV in seven of eight tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in four of eight tuff samples, with a maximum concentration of 38.3 mg/kg. Two of the four results also exceeded the maximum background concentration of lead in tuff (15.5 mg/kg). The box plot for lead in tuff is presented in Figure F-3.28-2. Lead is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in four of eight tuff samples, with a maximum concentration of 13.1 mg/kg. Three of the four results also exceeded the maximum background concentration of nickel in tuff (7 mg/kg). The box plot for nickel in tuff is presented in Figure F-3.28-3. Nickel is identified as a COPC in tuff.

Nitrate was detected in two of eight tuff samples and has no BV. Nitrate is identified as a COPC in tuff.

Selenium was detected above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in seven of eight tuff samples, with a maximum concentration of 0.41 mg/kg. The box plot for selenium in tuff is presented in Figure F-3.28-4. Selenium is identified as a COPC in tuff.

F-3.28.2 Organic Chemicals at SWMU 01-007(c)

All eight samples collected at SWMU 01-007(c) were analyzed for PCBs, SVOCs, and VOCs. Table 6.30-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.30-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.30-3.

F-3.28.2.1 Organic Chemicals in Tuff

Eight tuff samples from SWMU 01-007(c) were analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1260, benzene, n-butylbenzene, sec-butylbenzene, chloroform, 4-isopropyltoluene, styrene, toluene, vinyl chloride, and xylene (total) each were detected in one or two tuff samples and are identified as COPCs in tuff.

F-3.28.3 Radionuclides at SWMU 01-007(c)

All eight samples collected at SWMU 01-007(c) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.30-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.30-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 6.30-4.

F-3.28.3.1 Radionuclides in Tuff

Eight tuff samples from SWMU 01-007(c) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-238 was detected in one of eight tuff samples at a concentration of 0.112 pCi/g, and has no tuff FV. Plutonium-238 is identified as a COPC in tuff.

Plutonium-239/240 was detected in three of eight tuff samples with a maximum concentration of 0.459 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in one of eight tuff samples, at a concentration of 0.13 pCi/g. Results were compared only to the BV because background dataset for uranium-235/236 in tuff is not available. Uranium-235/236 is identified as a COPC in tuff.

F-3.28.4 Summary of COPCs at SWMU 01-007(c)

The inorganic chemicals identified as COPCs at SWMU 01-007(c) are chromium, total cyanide, lead, nickel, nitrate, and selenium.

The organic chemicals identified as COPCs at SWMU 01-007(c) are Aroclor-1260, benzene, n-butylbenzene, sec-butylbenzene, chloroform, 4-isopropyltoluene, styrene, toluene, vinyl chloride, and xylene (total).

The radionuclides identified as COPCs at SWMU 01-007(c) are plutonium-238, plutonium-239/240, and uranium-235/236.

F-3.28.5 Nature and Extent of Contamination at SWMU 01-007(c)

F-3.28.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 01-007(c) are chromium, total cyanide, lead, nickel, nitrate, and selenium. Sample results are presented in Table 6.30-2 and Figure 6.30-2.

Concentrations of chromium and nickel increased with depth at all four locations sampled. The lateral and vertical extent of chromium and nickel are not defined.

Cyanide was not detected at the site. Therefore, the lateral and vertical extent of cyanide are defined.

Concentrations of lead increase slightly with depth at one location 00-603897 and decrease with depth at location 00-603895. Concentrations of lead at location 00-603897 are less than 2 times the maximum tuff background concentration (15.5 mg/kg). Therefore, the lateral and vertical extent of lead are defined.

Nitrate was detected in two samples at concentrations of 0.16 and 0.18 mg/kg. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent of nitrate are defined.

Concentrations of selenium were slightly above BV and generally decrease with depth. Therefore, the lateral and vertical extent of selenium are defined.

F-3.28.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 01-007(c) are Aroclor-1260, benzene, n-butylbenzene, sec-butylbenzene, chloroform, 4-isopropyltoluene, styrene, toluene, vinyl chloride, and xylene (total). Sample results are presented in Table 6.30-3 and are shown in Figure 6.30-3.

All organic COPCs except Aroclor-1260 were detected only once in one sample at the site, and concentrations are near or below EQLs. Aroclor-1260 concentrations decrease with depth. Therefore, the lateral and vertical extent of all organic COPCs are defined.

F-3.28.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs identified at SWMU 01-007(c) are plutonium-238, plutonium-239/240, and uranium-235/236. Sample results are presented in Table 6.30-4 and are shown in Figure 6.30-4.

Concentrations of plutonium-238 and plutonium-239/240 decrease with depth at all locations. Therefore, the lateral and vertical extent of plutonium-238 and plutonium-239/240 are defined.

Uranium-235/236 was detected slightly above BV at location 00-603898, and concentrations decrease with depth. Therefore, the lateral and vertical extent of uranium-235/236 are defined.

F-3.28.5.4 Summary of Nature and Extent at SWMU 01-007(c)

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined at SWMU 01-007(c), except for the lateral and vertical extent of chromium and nickel.

F-3.29 SWMU 01-007(d)

Six samples (all tuff) were collected during the 2008–2009 investigation from three locations at SWMU 01-007(d). Table 6.31-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.31-1 is the site map showing sampling locations.

F-3.29.1 Inorganic Chemicals at SWMU 01-007(d)

All six samples collected at SWMU 01-007(d) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.31-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.31-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.31-2.

F-3.29.1.1 Inorganic Chemicals in Tuff

Six tuff samples from SWMU 01-007(d) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Chromium was detected above the BV (7.14 mg/kg) and above the maximum background concentration of chromium in tuff (13 mg/kg) in all six tuff samples, with a maximum concentration of 62.9 mg/kg. The box plot for chromium in tuff is presented in Figure F-3.29-1. Chromium is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in one of six tuff samples, at a concentration of 5.3 mg/kg. The sample result did not exceed the maximum background concentration of copper in tuff (6.2 mg/kg). The box plot for copper in tuff is presented in Figure F-3.29-2. Copper is not identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in three of six tuff samples, with a maximum concentration of 25.7 mg/kg. Two of the three results also exceeded the maximum background concentration of lead in tuff (15.5 mg/kg). The box plot for lead in tuff is presented in Figure F-3.29-3. Lead is identified as a COPC in tuff.

Manganese was detected above the BV (482 mg/kg) in one of six tuff samples, at a concentration of 499 mg/kg. The sample result did not exceed the maximum background concentration of manganese in tuff (752 mg/kg). The box plot for manganese in tuff is presented in Figure F-3.29-4. Manganese is not identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in all six tuff samples, with a maximum concentration of 29.8 mg/kg. The box plot for nickel in tuff is presented in Figure F-3.29-5. Nickel is identified as a COPC in tuff.

Nitrate was detected in all six tuff samples and has no BV. Nitrate is identified as a COPC in tuff.

Selenium was detected above the BV (0.3 mg/kg) in three of six tuff samples, with a maximum concentration of 0.42 mg/kg. Selenium also had DLs (0.54 and 0.56 mg/kg) above the BV in two tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). The box plot for selenium in tuff is presented in Figure F-3.29-6. Selenium is identified as a COPC in tuff.

F-3.29.2 Organic Chemicals at SWMU 01-007(d)

All six samples collected at SWMU 01-007(d) were analyzed for PCBs, SVOCs, and VOCs. Table 6.31-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.31-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.31-3.

F-3.29.2.1 Organic Chemicals in Tuff

Six tuff samples from SWMU 01-007(d) were analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1260, di-n-octylphthalate, methylene chloride, and 1,2,4-trimethylbenzene were detected in one or more tuff samples and are identified as COPCs in tuff.

F-3.29.3 Radionuclides at SWMU 01-007(d)

All six samples collected at SWMU 01-007(d) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.31-1 summarizes the samples collected and the requested analyses for each sample.

F-3.29.3.1 Radionuclides in Tuff

Six tuff samples from SWMU 01-007(d) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

No radionuclides were detected or detected above BVs in any of the tuff samples from SWMU 01-007(d). Therefore, no radionuclides are identified as COPCs in tuff.

F-3.29.4 Summary of COPCs at SWMU 01-007(d)

The inorganic chemicals identified as COPCs at SWMU 01-007(d) are chromium, lead, nickel, nitrate, and selenium.

The organic chemicals identified as COPCs at SWMU 01-007(d) are Aroclor-1260, di-n-octylphthalate, methylene chloride, and 1,2,4-trimethylbenzene.

No radionuclides are identified as COPCs at SWMU 01-007(d).

F-3.29.5 Nature and Extent of Contamination at SWMU 01-007(d)

F-3.29.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 01-007(d) are chromium, lead, nickel, nitrate, and selenium. Sample results are presented in Table 6.31-2 and are shown in Figure 6.31-2.

Concentrations of chromium and nickel increase with depth at location 00-604241 but decrease with depth at the other two locations, including the greater sample depths at location 00-604242. The lateral and vertical extent of chromium and nickel are defined.

Concentrations of lead decrease with depth at both locations. Therefore, the lateral and vertical extent of lead are defined.

Nitrate was detected in all samples at concentrations of 0.11–0.73 mg/kg. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent of nitrate are defined.

Selenium was detected in three samples at concentrations 0.32–0.42 mg/kg. These concentrations are less than twice the BV. The lateral and vertical extent of selenium are defined.

F-3.29.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 01-007(d) are Aroclor-1260, di-n-octylphthalate, methylene chloride, and 1,2,4-trimethylbenzene. Sample results are presented in Table 6.31-1 and are shown in Figure 6.31-3.

Concentrations of Aroclor-1260 and di-n-octylphthalate decrease with depth. Concentrations of methylene chloride and 1,2,4-trimethylbenzene are at or below EQLs and decrease with depth at one or two locations. Therefore, the lateral and vertical extent of all organic COPCs are defined.

F-3.29.5.3 Summary of Nature and Extent at SWMU 01-007(d)

The lateral and vertical extent of all inorganic and organic COPCs are defined at SWMU 01-007(d).

F-3.30 SWMU 01-007(e)

Four samples (all tuff) were collected during the 2008–2009 investigation from two locations at SWMU 01-007(e). Table 6.32-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.32-1 is the site map showing sampling locations.

F-3.30.1 Inorganic Chemicals at SWMU 01-007(e)

All four samples collected at SWMU 01-007(e) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.32-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.32-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.32-2.

F-3.30.1.1 Inorganic Chemicals in Tuff

Four tuff samples from SWMU 01-007(e) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Barium was detected above the BV (46.0 mg/kg) in two of four tuff samples, with concentrations of 46.4 and 53.5 mg/kg. One of the two results also exceeded the maximum background concentration of barium in tuff (51.6 mg/kg). The box plot for barium in tuff is presented in Figure F-3.30-1. Barium is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum background concentration of calcium in tuff (2230 mg/kg) in one of four tuff samples, at a concentration of 2580 mg/kg. The box plot for calcium in tuff is presented in Figure F-3.30-2. Calcium is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in one of four tuff samples, at a concentration of 8.6 mg/kg. The sample result did not exceed the maximum background concentration of chromium in tuff (13 mg/kg). The box plot for chromium in tuff is presented in Figure F-3.30-3. Chromium is not identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) and above the maximum background concentration of copper in tuff (6.2 mg/kg) in three of four tuff samples, with a maximum concentration of 12.4 mg/kg. The box plot for copper in tuff is presented in Figure F-3.30-4. Copper is identified as a COPC in tuff.

Total cyanide was not detected but had DLs (0.56–0.6 mg/kg) above the BV (0.5 mg/kg) in all four tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in one of four tuff samples, at a concentration of 11.5 mg/kg. The sample result did not exceed the maximum background concentration of lead in tuff (15.5 mg/kg). The box plot for lead in tuff is presented in Figure F-3.30-5. Lead is not identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in two of four tuff samples, at concentrations of 6.6 and 7.3 mg/kg. One of the two results also exceeded the maximum background concentration of nickel in tuff (7 mg/kg). The box plot for nickel in tuff is presented in Figure F-3.30-6. Nickel is identified as a COPC in tuff.

Nitrate was detected in two of four tuff samples and has no BV. Nitrate is identified as a COPC in tuff.

Selenium was detected above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in two of four tuff samples, with concentrations of 0.33 and 0.32 mg/kg. The box plot for selenium in tuff is presented in Figure F-3.30-7. Selenium is identified as a COPC in tuff.

Silver was detected above the BV (1 mg/kg) and above the maximum background concentration of silver in tuff (1.9 mg/kg) in one of four tuff samples, at a concentration of 3.1 mg/kg. The box plot for silver in tuff is presented in Figure F-3.30-8. Silver is identified as a COPC in tuff.

F-3.30.2 Organic Chemicals at SWMU 01-007(e)

All four samples collected at SWMU 01-007(e) were analyzed for PCBs, SVOCs, and VOCs. Table 6.32-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.32-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.32-3.

F-3.30.2.1 Organic Chemicals in Tuff

Four tuff samples from SWMU 01-007(e) were analyzed for PCBs, SVOCs, and VOCs.

Anthracene, Aroclor-1254, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, ethylbenzene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, and trichlorofluoromethane were detected in one or more tuff samples and are identified as COPCs in tuff.

F-3.30.3 Radionuclides at SWMU 01-007(e)

All four samples collected at SWMU 01-007(e) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.32-1 summarizes the samples collected and the requested analyses for each sample.

F-3.30.3.1 Radionuclides in Tuff

Four tuff samples from SWMU 01-007(e) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

No radionuclides were detected or detected above BVs in the tuff samples. Therefore, no radionuclides are identified as COPCs.

F-3.30.4 Summary of COPCs at SWMU 01-007(e)

The inorganic chemicals identified as COPCs at SWMU 01-007(e) are barium, calcium, copper, total cyanide, nickel, nitrate, selenium, and silver.

The organic chemicals identified as COPCs at SWMU 01-007(e) are anthracene, Aroclor-1254, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, ethylbenzene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, and trichlorofluoromethane.

No radionuclide COPCs are identified at SWMU 01-007(e).

F-3.30.5 Nature and Extent of Contamination at SWMU 01-007(e)

F-3.30.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 01-007(e) are barium, calcium, copper, total cyanide, nickel, nitrate, selenium, and silver. Sample results are presented in Table 6.32-2 and Figure 6.32-2.

Concentrations of barium, copper, nickel, and silver decrease with depth. Therefore, the lateral and vertical extent of these COPCs are defined.

Calcium was detected above the BV in one sample and the concentration decreases with depth at this location. Calcium was not detected above the BV at the other location. Therefore, the lateral and vertical extent of calcium are defined.

Cyanide was not detected at the site. Therefore, the lateral and vertical extent of cyanide are defined.

Nitrate was detected in two samples at concentrations of 1 and 1.1 mg/kg. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent of nitrate are defined.

Selenium was detected above the BV in two samples at concentrations of 0.32 and 0.33 mg/kg. These concentrations are less than 10% above the BV. Therefore, the lateral and vertical extent of selenium are defined.

F-3.30.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 01-007(e) are anthracene, Aroclor-1254, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, ethylbenzene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, and trichlorofluoromethane. Sample results are presented in Table 6.32-3 and are shown in Figure 6.32-3.

Concentrations of all organic COPCs decrease with depth. Therefore, the lateral and vertical extent of all organic COPCs are defined.

F-3.30.5.3 Summary of Nature and Extent at SWMU 01-007(e)

The lateral and vertical extent of all inorganic and organic COPCs are defined at SWMU 01-007(e).

F-3.31 SWMU 01-007(j)

Two samples (both tuff) were collected during the 2008–2009 investigation from one location at SWMU 01-007(j). Table 6.33-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.33-1 is the site map showing sampling locations.

F-3.31.1 Inorganic Chemicals at SWMU 01-007(j)

Both samples collected at SWMU 01-007(j) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.33-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.33-2 lists the inorganic chemicals above BVs.

F-3.31.1.1 Inorganic Chemicals in Tuff

Two tuff samples from SWMU 01-007(j) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Copper was detected above the BV in one of two tuff samples, at a concentration of 4.66 mg/kg. The sample result is below the maximum background concentration of copper in tuff (6.2 mg/kg). The box plot for copper in tuff is presented in Figure F-3.31-1. Copper is not identified as a COPC in tuff.

Total cyanide was not detected, but has a DL (0.6 mg/kg) above the BV (0.5 mg/kg) in one of two tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

F-3.31.2 Organic Chemicals at SWMU 01-007(j)

Both samples collected at SWMU 01-007(j) were analyzed for PCBs, SVOCs, and VOCs. Table 6.33-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.33-1 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.33-2.

F-3.31.2.1 Organic Chemicals in Tuff

Two tuff samples from SWMU 01-007(j) were analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1254, bis(2-ethylhexyl)phthalate, and di-n-butylphthalate were detected in one or both tuff samples, and are identified as COPCs in tuff.

F-3.31.3 Radionuclides at SWMU 01-007(j)

Both samples collected at SWMU 01-007(j) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.33-1 summarizes the samples collected and the requested analyses for each sample.

F-3.31.3.1 Radionuclides in Tuff

Two tuff samples from SWMU 01-007(j) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

No radionuclides were detected or detected above BVs in the tuff samples from SWMU 01-007(j). Therefore, no radionuclides are identified as COPCs in tuff.

F-3.31.4 Summary of COPCs at SWMU 01-007(j)

The inorganic chemical identified as a COPC at SWMU 01-007(j) is total cyanide.

The organic chemicals identified as COPCs at SWMU 01-007(j) are Aroclor-1254, bis(2-ethylhexyl)phthalate, and di-n-butylphthalate.

No radionuclides are identified as COPCs at SWMU 01-007(j).

F-3.31.5 Nature and Extent of Contamination at SWMU 01-007(j)

F-3.31.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPC identified at SWMU 01-007(j) is total cyanide. Sample results are presented in Table 6.33-2.

Cyanide was not detected at the site. Therefore, the lateral and vertical extent of cyanide are defined.

F-3.31.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 01-007(j) are Aroclor-1254, bis(2-ethylhexyl)phthalate, and di-n-butylphthalate. Sample results are presented in Table 6.33-3 and Figure 6.33-2.

Concentrations of all organic COPCs decrease with depth. Aroclor-1254 was also detected at lower concentrations in samples at similar depths at nearby location 00-604245 [SWMU 01-007(e)]. Therefore, the lateral and vertical extent of these COPCs are defined.

F-3.31.5.3 Summary of Nature and Extent at SWMU 01-007(j)

The lateral and vertical extent of all inorganic and organic COPCs are defined at SWMU 01-007(j).

F-3.32 AOC 01-007(k)

Six samples (all tuff) were collected during the 2008–2009 investigation from three locations at AOC 01-007(k). Table 6.34-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.34-1 is the site map showing sampling locations.

F-3.32.1 Inorganic Chemicals at AOC 01-007(k)

All six samples from AOC 01-007(k) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 6.34-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.34-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.34-2.

F-3.32.1.1 Inorganic Chemicals in Tuff

Six tuff samples from AOC 01-007(k) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Aluminum was detected above the BV (7340 mg/kg) and above the maximum background concentration of aluminum in tuff (8370 mg/kg) in one of six tuff samples, at a concentration of 9730 mg/kg. The box plot for aluminum in tuff is presented in Figure F-3.32-1. Aluminum is identified as a COPC in tuff.

Antimony was not detected, but has a DL (0.57 mg/kg) above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in one of six tuff samples. The DL is less than 20% above the BV. Because antimony only has a DL that is slightly and infrequently above background (one of six samples), it is not identified as a COPC in tuff.

Arsenic was detected above the BV (2.79 mg/kg) in one of six tuff samples, at a concentration of 2.9 mg/kg. The sample result is below the maximum background concentration of arsenic in tuff (5 mg/kg). The box plot for arsenic in tuff is presented in Figure F-3.32-2. Arsenic is not identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) and above the maximum background concentration of barium in tuff (51.6 mg/kg) in one of six tuff samples, at a concentration of 58.8 mg/kg. The box plot for barium in tuff is presented in Figure F-3.32-3. Barium is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum background concentration of calcium in tuff (2230 mg/kg) in one of six tuff samples, at a concentration of 3000 mg/kg. The sample concentration is less than twice the BV. Based on EPA's Risk Assessment Guidance for Superfund, section 5.9.4, page 5-23, calcium may be eliminated as a COPC if detected infrequently above background (one of six samples) and not substantially above background. The box plot for calcium in tuff is presented in Figure F-3.32-4. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in four of six tuff samples, with a maximum concentration of 21.3 mg/kg. Three of the four results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). The box plot for chromium in tuff is presented in Figure F-3.32-5. Chromium is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) and above the maximum background concentration of copper in tuff (6.2 mg/kg) in one of six tuff samples, at a concentration of 159 mg/kg. The box plot for copper in tuff is presented in Figure F-3.32-6. Copper is identified as a COPC in tuff.

Total cyanide was not detected, but has DLs (0.58–0.62 mg/kg) above the BV (0.5 mg/kg) in four of six tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in one of six tuff samples, at a concentration of 13 mg/kg. The sample result is below the maximum background concentration of lead in tuff (15.5 mg/kg). The box plot for lead in tuff is presented in Figure F-3.32-7. Lead is not identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in five of six tuff samples, with a maximum concentration of 10.3 mg/kg. Four of the five results also exceeded the maximum background concentration of nickel in tuff (7 mg/kg). The box plot for nickel in tuff is presented in Figure F-3.32-8. Nickel is identified as a COPC in tuff.

Nitrate was detected in one of six tuff samples and has no BV. Nitrate is identified as a COPC in tuff.

Selenium was detected above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in two of six tuff samples, with concentrations of 0.36 and 0.32 mg/kg. Selenium also had DLs (0.57–0.61 mg/kg) above the BV in the other four tuff samples. The box plot for selenium in tuff is presented in Figure F-3.32-9. Selenium is identified as a COPC in tuff.

F-3.32.2 Organic Chemicals at SWMU 01-007(k)

All six samples from AOC 01-007(k) were analyzed for PCBs, SVOCs, and VOCs. Table 6.34-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.34-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.34-3.

F-3.32.2.1 Organic Chemicals in Tuff

Six tuff samples from AOC 01-007(k) were analyzed for PCBs, SVOCs, and VOCs.

Acetone and methylene chloride were detected in one or more tuff samples, and are identified as COPCs in tuff.

F-3.32.3 Radionuclides at AOC 01-007(k)

All six samples from AOC 01-007(k) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 6.34-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.34-4 presents the radionuclides detected above BVs. The sampling locations and detected concentrations above BVs are shown in Figure 6.34-4.

F-3.32.3.1 Radionuclides in Tuff

Six tuff samples from AOC 01-007(k) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in two of six tuff samples, with concentrations of 0.16 and 0.197 pCi/g. Results were compared only to the BV because background dataset for uranium-235/236 in tuff is not available. Uranium-235/236 is identified as a COPC in tuff.

F-3.32.4 Summary of COPCs at AOC 01-007(k)

The inorganic chemicals identified as COPCs at AOC 01-007(k) are aluminum, barium, chromium, copper, total cyanide, nickel, nitrate, and selenium.

The organic chemicals identified as COPCs at AOC 01-007(k) are acetone and methylene chloride.

The only radionuclide identified as a COPC at AOC 01-007(k) is uranium-235/236.

F-3.32.5 Nature and Extent of Contamination at AOC 01-007(k)

F-3.32.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at AOC 01-007(k) are aluminum, barium, chromium, copper, total cyanide, nickel, nitrate, and selenium. Sample results are presented in Table 6.34-2 and are shown in Figure 6.34-2.

Aluminum was detected above the BV only in the deepest sample at location 00-603881. The concentration is less than twice the BV. Aluminum was not detected above the BV at the other locations. Therefore, the lateral and vertical extent of aluminum are defined.

Concentrations of barium increase with depth at location 00-603881; concentrations of chromium and nickel increase with depth at locations 00-603879 and 00-603881. However, most concentrations are slightly above the BVs, and concentrations of chromium and nickel are less than 3 times the BVs. Therefore, the lateral and vertical extent of barium, chromium, and nickel are defined.

Copper was detected only once at the site, and the concentration decreases with depth. Therefore, the lateral and vertical extent of copper are defined.

Cyanide was not detected at the site. Therefore, the lateral and vertical extent of cyanide are defined.

Nitrate was detected in one sample at a concentration of 3.1 mg/kg. Concentrations decreased with depth at this location. Nitrate was not detected at the other locations. Therefore, the lateral and vertical extent of nitrate are defined.

Selenium was detected above the BV in two samples at concentrations of 0.32 and 0.36 mg/kg. These concentrations are 20% or less above the BV. Therefore, the lateral and vertical extent of selenium are defined.

F-3.32.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at AOC 01-007(k) are acetone and methylene chloride. Sample results are presented in Table 6.34-3 and are shown in Figure 6.34-3.

Acetone was detected only once at 0.0064 mg/kg in the deeper sample at location 00-603879. Because it was detected only once at a low level, the lateral and vertical extent of acetone are defined.

Concentrations of methylene chloride decrease with depth or remain essentially the same. However, all concentrations are below EQLs. Therefore, the lateral and vertical extent of methylene chloride are defined.

F-3.32.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPC identified at AOC 01-007(k) is uranium-235/236. Sample results are presented in Table 6.34-4 and are shown in Figure 6.34-4.

Uranium-235/236 was detected at 0.16 and 0.197 pCi/g at location 00-603880, concentrations increase slightly with depth. However, the concentrations are less than or slightly above twice the BV of 0.09 pCi/g. Therefore, the lateral and vertical extent of uranium-235/236 is defined.

F-3.32.5.4 Summary of Nature and Extent at AOC 01-007(k)

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined at AOC 01-007(k).

F-4.0 COPCs FOR SITES AT TA-03

F-4.1 SWMU 03-009(j)

Four samples (all tuff) were collected during the 2008–2009 investigation from two locations at SWMU 03-009(j). Table 7.3-1 summarizes the samples collected and the requested analyses for each sample. Figure 7.3-1 is the site map showing sampling locations.

F-4.1.1 Inorganic Chemicals at SWMU 03-009(j)

All four samples collected at SWMU 03-009(j) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 7.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 7.3-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 7.3-2.

F-4.1.1.1 Inorganic Chemicals in Tuff

Four tuff samples from SWMU 03-009(j) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Aluminum was detected above the BV (7340 mg/kg) in all four tuff samples, with a maximum concentration of 11700 mg/kg. Three of the four results also exceeded the maximum background concentration of aluminum in tuff (8370 mg/kg). The box plot for aluminum in tuff is presented in Figure F-4.1-1. Aluminum is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum background concentration of calcium in tuff (2230 mg/kg) in three of four tuff samples, with a maximum concentration of 3590 mg/kg. The box plot for calcium in tuff is presented in Figure F-4.1-2. Calcium is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in three of four tuff samples, with a maximum concentration of 15.2 mg/kg. One sample result also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). The box plot for chromium in tuff is presented in Figure F-4.1-3. Chromium is identified as a COPC in tuff.

Total cyanide was not detected above the BV (0.5 mg/kg), but had DLs (0.59 and 0.58 mg/kg) above the BV in two of four tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) and above the maximum background concentration of lead in tuff (15.5 mg/kg) in one of four tuff samples, at a concentration of 16.4 mg/kg. The box plot for lead in tuff is presented in Figure F-4.1-4. Lead is identified as a COPC in tuff.

Magnesium was detected above the BV (1690 mg/kg) in two of four tuff samples, with concentrations of 1740 and 1700 mg/kg. Both results are below the maximum background concentration of magnesium in tuff (2820 mg/kg). The box plot for magnesium in tuff is presented in Figure F-4.1-5. Magnesium is not identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in all four tuff samples, with a maximum concentration of 11.1 mg/kg. The box plot for nickel in tuff is presented in Figure F-4.1-6. Nickel is identified as a COPC in tuff.

Nitrate was detected in all four tuff samples and has no BV. Nitrate is identified as a COPC in tuff.

Selenium was not detected, but had DLs (0.58–0.63 mg/kg) above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in all four tuff samples. Selenium is identified as a COPC in tuff.

F-4.1.2 Organic Chemicals at SWMU 03-009(j)

All four samples collected at SWMU 03-009(j) were analyzed for PCBs, SVOCs, and VOCs. Table 7.3-1 summarizes the samples collected and the requested analyses for each sample.

F-4.1.2.1 Organic Chemicals in Tuff

Four tuff samples from SWMU 03-009(j) were analyzed for PCBs, SVOCs, and VOCs.

No organic chemicals were detected in the tuff samples. Therefore, no organic COPCs are identified.

F-4.1.3 Radionuclides at SWMU 03-009(j)

All four samples collected at SWMU 03-009(j) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 7.3-1 summarizes the samples collected and the requested analyses for each sample.

F-4.1.3.1 Radionuclides in Tuff

Four tuff samples from SWMU 03-009(j) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

No radionuclides were detected or detected above BVs in the tuff samples. Therefore, no radionuclide COPCs are identified.

F-4.1.4 Summary of COPCs at SWMU 03-009(j)

The inorganic chemicals identified as COPCs at SWMU 03-009(j) are aluminum, calcium, chromium, total cyanide, lead, nickel, nitrate, and selenium.

No organic chemicals are identified as COPCs at SWMU 03-009(j).

No radionuclides are identified as COPCs at SWMU 03-009(j).

F-4.1.5 Nature and Extent of Contamination at SWMU 03-009(j)

F-4.1.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 03-009(j) are aluminum, calcium, chromium, total cyanide, lead, nickel, nitrate, and selenium. Sample results are presented in Table 7.3-2 and Figure 7.3-2.

Concentrations of aluminum, chromium, lead, and nickel decrease with depth at location 00-604252 but increase slightly with depth at location 00-604253. However, all concentrations are less than 2 times the maximum background concentration. Therefore, the lateral and vertical extent of these COPCs are defined.

Concentrations of calcium decrease with depth at both locations at levels less than 2 times the BV. Therefore, the lateral and vertical extent of calcium are defined.

Cyanide and selenium were not detected at the site. Therefore, the lateral and vertical extent of cyanide and selenium are defined.

Nitrate was detected in all four samples at concentrations of 0.1–0.2 mg/kg. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent of nitrate are defined.

F-4.1.5.2 Summary of Nature and Extent at SWMU 03-009(j)

The lateral and vertical extent of inorganic COPCs are defined at SWMU 03-009(j).

F-4.2 SWMUs 03-038(a) and 03-038(b)

Eighteen samples (all tuff) were collected during the 2008–2009 investigation from six locations at SWMUs 03-038(a) and 03-038(b). Table 7.4-1 summarizes the samples collected and the requested analyses for each sample. Figure 7.4-1 is the site map showing sampling locations.

F-4.2.1 Inorganic Chemicals at SWMUs 03-038(a) and 03-038(b)

All 18 samples collected at SWMUs 03-038(a) and 03-038(b) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 7.4-1 summarizes the samples collected and the requested analyses for each sample.

Table 7.4-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 7.4-2.

F-4.2.1.1 Inorganic Chemicals in Tuff

Eighteen samples from SWMUs 03-038(a) and 03-038(b) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Antimony was not detected, but had DLs (0.58–0.6 mg/kg) above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in 6 of 18 tuff samples. Antimony is identified as a COPC in tuff.

Arsenic was detected above the BV (2.79 mg/kg) in 1 of 18 tuff samples, at a concentration of 3.1 mg/kg. The sample result is below the maximum background concentration of arsenic in tuff (5 mg/kg). Statistical tests were performed to determine if the site sample results for arsenic are different than background. The statistical test results are presented in Table F-4.2-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for arsenic in tuff is presented in Figure F-4.2-1. Arsenic is not identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) in 9 of 18 tuff samples, with a maximum concentration of 95.8 mg/kg. Eight of the nine results also exceeded the maximum background concentration of barium in tuff (51.6 mg/kg). Statistical tests were performed to determine if the site sample results for barium are different than background. The statistical test results are presented in Table F-4.2-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for barium in tuff is presented in Figure F-4.2-2. Barium is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum background concentration of calcium in tuff (2230 mg/kg) in 5 of 18 tuff samples, with a maximum concentration of 4740 mg/kg. Statistical tests were performed to determine if the site sample results for calcium are different than background. The statistical test results are presented in Table F-4.2-1. The results of both the Gehan test

and the quantile test indicate that the site sample results are not statistically different than background. The box plot for calcium in tuff is presented in Figure F-4.2-3. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 9 of 18 tuff samples, with a maximum concentration of 151 mg/kg. Seven of the nine results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). Chromium is interpreted as being substantially different than background, and no further evaluation is necessary. Chromium is identified as a COPC in tuff.

Cobalt was detected above the BV (3.14 mg/kg) and above the maximum background concentration of cobalt in tuff (also 3.14 mg/kg) in 1 of 18 tuff samples, at a concentration of 4.5 mg/kg. Statistical tests were performed to determine if the site sample results for cobalt are different than background. The statistical test results are presented in Table F-4.2-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for cobalt in tuff is presented in Figure F-4.2-4. Cobalt is not identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 4 of 18 tuff samples, with a maximum concentration of 10.3 mg/kg. Two of the four results also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). Statistical tests were performed to determine if the site sample results for copper are different than background. The statistical test results are presented in Table F-4.2-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for copper in tuff is presented in Figure F-4.2-5. Copper is identified as a COPC in tuff.

Total cyanide was detected above the BV (0.5 mg/kg) in 2 of 18 tuff samples, with concentrations of 0.96 and 0.54 mg/kg. Total cyanide also had DLs (0.53–0.6 mg/kg) above the BV in 11 of 18 tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 8 of 18 tuff samples, with a maximum concentration of 22 mg/kg. Three of the eight results also exceeded the maximum background concentration of lead in tuff (15.5 mg/kg). Statistical tests were performed to determine if the site sample results for lead are different than background. The statistical test results are presented in Table F-4.2-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for lead in tuff is presented in Figure F-4.2-6. Lead is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in 7 of 18 tuff samples, with a maximum concentration of 71.6 mg/kg. Statistical tests were performed to determine if the site sample results for nickel are different than background. The statistical test results are presented in Table F-4.2-1. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for nickel in tuff is presented in Figure F-4.2-7. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in tuff samples and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was not detected above the BV (0.3 mg/kg), but had DLs (0.54–0.56 mg/kg) above the BV and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in 4 of 18 tuff samples. Statistical tests were not performed because the background data of selenium in Qbt 2,3,4 tuff are all nondetects. Selenium is identified as a COPC in tuff.

F-4.2.2 Organic Chemicals at SWMUs 03-038(a) and 03-038(b)

All 18 samples collected at SWMUs 03-038(a) and 03-038(b) were analyzed for PCBs, SVOCs, and VOCs. Table 7.4-1 summarizes the samples collected and the requested analyses for each sample.

Table 7.4-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 7.4-3.

F-4.2.2.1 Organic Chemicals in Tuff

Eighteen tuff samples from SWMUs 03-038(a) and 03-038(b) were analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1254, Aroclor-1260, benzo(a)pyrene, benzo(g,h,i)perylene, bis(2-ethylhexyl)phthalate, chrysene, dibenz(a,h)anthracene, fluoranthene, 2-hexanone, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, and toluene were detected in one or more tuff samples, and are identified as COPCs in tuff.

F-4.2.3 Radionuclides at SWMUs 03-038(a) and 03-038(b)

All 18 samples collected at SWMUs 03-038(a) and 03-038(b) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 7.4-1 summarizes the samples collected and the requested analyses for each sample.

F-4.2.3.1 Radionuclides in Tuff

Eighteen tuff samples from SWMUs 03-038(a) and 03-038(b) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

No radionuclides were detected or detected above BVs in the tuff samples from SWMUs 03-038(a) and 03-038(b). Therefore, no radionuclide COPCs are identified.

F-4.2.4 Summary of COPCs at SWMUs 03-038(a) and 03-038(b)

The inorganic chemicals identified as COPCs at SWMUs 03-038(a) and 03-038(b) are antimony, barium, chromium, copper, total cyanide, lead, nickel, nitrate, perchlorate, and selenium.

The organic chemicals identified as COPCs at SWMUs 03-038(a) and 03-038(b) are Aroclor-1254, Aroclor-1260, benzo(a)pyrene, benzo(g,h,i)perylene, bis(2-ethylhexyl)phthalate, chrysene, dibenz(a,h)anthracene, fluoranthene, 2-hexanone, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, and toluene.

No radionuclides are identified as COPCs at SWMUs 03-038(a) and 03-038(b).

F-4.2.5 Nature and Extent of Contamination at SWMUs 03-038(a) and 03-038(b)

F-4.2.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMUs 03-038(a) and 03-038(b) are antimony, barium, chromium, copper, total cyanide, lead, nickel, nitrate, perchlorate, and selenium. Sample results are presented in Table 7.4-2 and Figure 7.4-2.

Antimony and selenium were not detected at the site. Therefore, the lateral and vertical extent of antimony and selenium are defined.

Barium was detected above the BV only in the deepest sample at locations 00-604255 through 00-604258, and concentrations of barium increase with depth at downslope location 00-604259. Therefore, the lateral and vertical extent of barium are not defined.

Chromium was detected above the BV only in the deepest samples at locations 00-604255 through 00-604258. The concentration of chromium decreases downslope from the maximum at location 00-604258. Therefore, the lateral extent of chromium is defined, but the vertical extent of chromium is not defined.

Copper was detected above the BV in the deepest sample at locations 00-604254 and 00-604258, but concentrations of copper decrease with depth at downslope location 00-604259. Therefore, the lateral extent of copper is defined, but the vertical extent of copper is not defined.

Cyanide (total) was detected above the BV in only two samples with concentrations less than twice the BV. Therefore, the lateral and vertical extent of cyanide are defined.

Lead was detected above the BV only in the deepest samples at locations 00-604256, 00-604257, and 00-604258. Concentrations of lead decrease slightly with depth at downslope location 00-604259. Therefore, the lateral extent of lead is defined, but the vertical extent of lead is not defined.

Nickel was detected above the BV only in the deepest samples at locations 00-604256 and 00-604258. Nickel decreases with depth at location 00-604259, the farthest downslope location. The concentration of nickel decreases downslope from the maximum at location 00-604258. Therefore, the lateral extent of nickel is defined, but the vertical extent of nickel is not defined.

Nitrate was detected in multiple samples at concentrations of 0.22–8.6 mg/kg. Nitrate concentrations decrease with depth at all locations except at location 00-604254 where nitrate was detected at 2.7 mg/kg in the deepest sample. Nitrate concentrations are less than 5 mg/kg and decrease with depth at the two downslope locations 00-604258 and 00-604259. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected only in samples at location 00-604254 at low levels. Perchlorate was not detected in samples from similar depths at other locations. Therefore, the lateral and vertical extent of perchlorate are defined.

F-4.2.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMUs 03-038(a) and 03-038(b) are Aroclor-1254, Aroclor-1260, benzo(a)pyrene, benzo(g,h,i)perylene, bis(2-ethylhexyl)phthalate, chrysene, dibenz(a,h)anthracene, fluoranthene, 2-hexanone, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, and toluene. Sample results are presented in Table 7.4-3 and are shown in Figure 7.4-3.

Aroclor-1254 was detected in five samples, and concentrations decrease with depth. Aroclor-1260 was detected in 11 samples, decreases with depth at one location, increases slightly with depth at 4 locations, and does not change substantially with depth at one location. All concentrations are at or below EQLs. The lateral and vertical extent of Aroclor-1254 and Aroclor-1260 are defined.

Benzo(a)pyrene, benzo(g,h,i)perylene, bis(2-ethylhexyl)phthalate, chrysene, dibenz(a,h)anthracene, 2-hexanone, indeno(1,2,3-cd)pyrene, and toluene were detected in one or two samples and decrease with depth or are below EQLs in the deeper samples. Fluoranthene, phenanthrene, and pyrene were detected in four to six samples. Concentrations are below EQLs, and decrease or remain unchanged with depth.

The lateral and vertical extent of all organic COPCs are defined.

F-4.2.5.3 Summary of Nature and Extent at SWMUs 03-038(a) and 03-038(b)

SWMUs 03-038(a) and 03-038(b) are locations where radioactive waste was handled, released, and subsequently excavated. No radionuclides were detected above BVs/FVs in samples from these sites. In addition, the lateral and vertical extent of all inorganic and organic COPCs are defined at SWMUs 03-038(a) and 03-038(b), except for the vertical extent of barium, chromium, copper, lead, and nickel.

F-4.3 SWMU 03-055(c)

Twenty samples (all sediment) were collected during the 2008–2009 investigation from 10 locations at SWMU 03-055(c). Table 7.5-1 summarizes the samples collected and the requested analyses for each sample. Figure 7.5-1 is the site map showing sampling locations.

F-4.3.1 Inorganic Chemicals at SWMU 03-055(c)

All 20 samples collected at SWMU 03-055(c) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 7.5-1 summarizes the samples collected and the requested analyses for each sample.

Table 7.5-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 7.5-2.

F-4.3.1.1 Inorganic Chemicals in Sediment

Twenty sediment samples from SWMU 03-055(c) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Arsenic was detected above the BV (3.98 mg/kg) and above the maximum background concentration of arsenic in sediment (3.6 mg/kg) in 1 of 20 sediment samples, at a concentration of 6.02 mg/kg. Statistical tests were performed to determine if the site sample results for arsenic are different than background. The statistical test results are presented in Table F-4.3-1. The result of the Gehan test indicates that the site sample results are not statistically different than background, while the result of the quantile test indicates that the sample results are statistically different than background. The box plot for arsenic in sediment is presented in Figure F-4.3-1. Arsenic is identified as a COPC in sediment.

Cadmium was not detected above the BV (0.4 mg/kg), but had a DL (0.573 mg/kg) above the BV and above the maximum background concentration of cadmium in sediment (0.18 mg/kg) in 1 of 20 sediment samples. Statistical tests were performed to determine if the site sample results for cadmium are different than background. The statistical test results are presented in Table F-4.3-1. The result of the quantile test

indicates that the site sample results are statistically different than background. The box plot for cadmium in sediment is presented in Figure F-4.3-2. Cadmium is identified as a COPC in sediment.

Calcium was detected above the BV (4420 mg/kg) and above the maximum background concentration of calcium in sediment (4240 mg/kg) in 2 of 20 sediment samples, with concentrations of 4440 and 5670 mg/kg. Statistical tests were performed to determine if the site sample results for calcium are different than background. The statistical test results are presented in Table F-4.3-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for calcium in sediment is presented in Figure F-4.3-3. Calcium is not identified as a COPC in sediment.

Chromium was detected above the BV (10.5 mg/kg) and above the maximum background concentration of chromium in sediment (9.2 mg/kg) in 2 of 20 sediment samples, with concentrations of 10.6 and 11.1 mg/kg. Statistical tests were performed to determine if the site sample results for chromium are different than background. The statistical test results are presented in Table F-4.3-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for chromium in sediment is presented in Figure F-4.3-4. Chromium is not identified as a COPC in sediment.

Cobalt was detected above the BV (4.73 mg/kg) and above the maximum background concentration of cobalt in sediment (4.2 mg/kg) in 1 of 20 sediment samples, at a concentration of 8.52 mg/kg. Statistical tests were performed to determine if the site sample results for cobalt are different than background. The statistical test results are presented in Table F-4.3-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for cobalt in sediment is presented in Figure F-4.3-5. Cobalt is not identified as a COPC in sediment.

Copper was detected above the BV (11.2 mg/kg) in 2 of 20 sediment samples, with concentrations of 11.6 and 15.1 mg/kg. One of the two results also exceeded the maximum background concentration of copper in sediment (12 mg/kg). Statistical tests were performed to determine if the site sample results for copper are different than background. The statistical test results are presented in Table F-4.3-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for copper in sediment is presented in Figure F-4.3-6. Copper is identified as a COPC in sediment.

Total cyanide was detected above the BV (0.82 mg/kg) and above the maximum background concentration of total cyanide in sediment (0.63 mg/kg) in 3 of 20 samples, with a maximum concentration of 2.79 mg/kg. Statistical tests were performed to determine if the site sample results for total cyanide are different than background. The statistical test results are presented in Table F-4.3-1. The result of the Gehan test indicates that the site sample results are not statistically different than background, while the result of the quantile test indicates that the sample results are statistically different than background. The box plot for total cyanide in sediment is presented in Figure F-4.3-7. Total cyanide is identified as a COPC in sediment.

Lead was detected above the BV (19.7 mg/kg) in 6 of 20 sediment samples, with a maximum concentration of 174 mg/kg. Four of the six results also exceeded the maximum background concentration of lead in sediment (25.6 mg/kg). Statistical tests were performed to determine if the site sample results for lead are different than background. The statistical test results are presented in Table F-4.3-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for lead in sediment is presented in Figure F-4.3-8. Lead is identified as a COPC in sediment.

Nitrate was detected in 7 of 20 sediment samples and has no BV. Nitrate is identified as a COPC in sediment.

Selenium was detected above the BV (0.3 mg/kg) in 2 of 20 sediment samples, with concentrations of 0.642 and 1.13 mg/kg. Selenium also had DLs (1.56–8.91 mg/kg) above the BV in the other 18 sediment samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in sediment (0.1 mg/kg). Statistical tests were not performed because the background data of selenium in sediment are all nondetects. The box plot for selenium in sediment is presented in Figure F-4.3-9. Selenium is identified as a COPC in sediment.

Vanadium was detected above the BV (19.7 mg/kg) and above the maximum background concentration of vanadium in sediment (20 mg/kg) in 1 of 20 sediment samples, at a concentration of 24 mg/kg. Statistical tests were performed to determine if the site sample results for vanadium are different than background. The statistical test results are presented in Table F-4.3-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for vanadium in sediment is presented in Figure F-4.3-10. Vanadium is not identified as a COPC in sediment.

Zinc was detected above the BV (60.2 mg/kg) and above the maximum background concentration of zinc in sediment (56.2 mg/kg) in 14 of 20 sediment samples, with a maximum concentration of 276 mg/kg. Statistical tests were performed to determine if the site sample results for zinc are different than background. The statistical test results are presented in Table F-4.3-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for zinc in sediment is presented in Figure F-4.3-11. Zinc is identified as a COPC in sediment.

F-4.3.2 Organic Chemicals at SWMU 03-055(c)

All 20 samples collected at SWMU 03-055(c) were analyzed for explosive compounds, PCBs, SVOCs, and VOCs. Table 7.5-1 summarizes the samples collected and the requested analyses for each sample.

Table 7.5-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 7.5-1.

F-4.3.2.1 Organic Chemicals in Sediment

Twenty sediment samples from SWMU 03-055(c) were analyzed for explosive compounds, PCBs, SVOCs, and VOCs.

Acenaphthene, acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzoic acid, bis(2-ethylhexyl)phthalate, 2-butanone, chrysene, dibenzofuran, ethylbenzene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, naphthalene, phenanthrene, pyrene, toluene, trichlorofluoromethane, 1,2-xylene, and 1,3-xylene+1,4-xylene were detected in one or more sediment samples and are identified as COPCs in sediment.

F-4.3.3 Radionuclides at SWMU 03-055(c)

All 20 samples collected at SWMU 03-055(c) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 7.5-1 summarizes the samples collected and the requested analyses for each sample.

Table 7.5-4 presents the radionuclides detected above FVs.

F-4.3.3.1 Radionuclides in Sediment

Twenty sediment samples from SWMU 03-055(c) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) and above the maximum background concentration of plutonium-239/240 in sediment (0.065 pCi/g) in 1 of 20 sediment samples, at a concentration of 0.0905 pCi/g. Statistical tests were performed to determine if the site sample results for plutonium-239/240 are different than background. The statistical test results are presented in Table F-4.3-2. The results of both the quantile test and Slippage test indicate that the site sample results are not statistically different than background. The box plot for plutonium-239/240 in sediment is presented in Figure F-4.3-12. Plutonium-239/240 is not identified as a COPC in sediment.

Tritium was detected above the FV (0.093 pCi/g) and above the maximum background concentration of tritium in sediment (0.0856 pCi/g) in 1 of 20 sediment samples, at a concentration of 0.116 pCi/g. Statistical tests were performed to determine if the site sample results for tritium are different than background. The statistical test results are presented in Table F-4.3-2. The results of both the quantile test and Slippage test indicate that the site sample results are not statistically different than background. The box plot for tritium in sediment is presented in Figure F-4.3-13. Tritium is not identified as a COPC in sediment.

F-4.3.4 Summary of COPCs at SWMU 03-055(c)

The inorganic chemicals identified as COPCs at SWMU 03-055(c) are arsenic, cadmium, copper, total cyanide, lead, nitrate, selenium, and zinc.

The organic chemicals identified as COPCs at SWMU 03-055(c) are acenaphthene, acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzoic acid, bis(2-ethylhexyl)phthalate, 2-butanone, chrysene, dibenzofuran, ethylbenzene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, naphthalene, phenanthrene, pyrene, toluene, trichlorofluoromethane, 1,2-xylene, and 1,3-xylene+1,4-xylene.

No radionuclides are identified as COPCs at SWMU 03-055(c).

F-4.3.5 Nature and Extent of Contamination at SWMU 03-055(c)

F-4.3.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 03-055(c) are arsenic, cadmium, copper, total cyanide, lead, nitrate, selenium, and zinc. Sample results are presented in Table 7.5-2 and are shown in Figure 7.5-2.

Arsenic, copper, and selenium were detected above BVs in only one or two samples at the site. Concentrations of arsenic, and copper decrease with depth. Concentrations of selenium decrease along the slope. Therefore, the lateral and vertical extent of arsenic, copper, and selenium are defined.

Cadmium was not detected at the site. Therefore, the lateral and vertical extent of cadmium are defined.

Cyanide (total) was detected above the BV in three samples, and concentrations increase with depth at location 00-603243. However, cyanide was not detected above the BV in samples from greater depths at other locations at the site. Concentrations of cyanide (total) decrease downslope. Therefore, the lateral and vertical extent of cyanide (total) are defined.

Concentrations of lead increase with depth at locations 03-603243 and 03-603248. The highest concentration of lead was detected from 3.12–3.61 ft bgs at location 03-603258, where the concentration decreases in the next deeper sample to less than twice the maximum background concentration. The concentration of lead decreases downslope and was not detected above its BV in the five locations farthest downslope. The lateral and vertical extent of lead are defined.

Nitrate was detected in seven samples at concentrations of 1.06–1.59 mg/kg. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent of nitrate are defined.

Concentrations of zinc increase with depth at 00-603243, 00-603245, 00-603248, and 00-603250. Zinc was not detected above its BV at the location farthest downslope (location 03-603257). Zinc concentrations are likely to the result of runoff from the galvanized drainpipe that directs stormwater into the drainage at SWMU 03-055(c). The lateral extent of zinc is defined, but the vertical extent of zinc is not defined.

F-4.3.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 03-055(c) are acenaphthene, acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzoic acid, bis(2-ethylhexyl)phthalate, 2-butanone, chrysene, dibenzofuran, ethylbenzene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, naphthalene, phenanthrene, pyrene, toluene, trichlorofluoromethane, 1,2-xylene, and 1,3-xylene+1,4-xylene. Sample results are presented in Table 7.5-3 and are shown on Plate 7.5-1.

The majority of detections of organic COPCs are at concentrations near or below the EQLs. Concentrations generally decrease or remain the same with depth. Concentrations increase slightly at locations 03-603243 and 03-603248. However, because most concentrations are at or below EQLs, the lateral and vertical extent of all organic COPCs are defined.

F-4.3.5.3 Summary of Nature and Extent at SWMU 03-055(c)

The lateral and vertical extent of all inorganic and organic COPCs are defined at SWMU 03-055(c), except for the vertical extent of zinc.

F-5.0 COPCs FOR SITES AT TA-32

F-5.1 SWMU 32-001

A total of 12 samples (six soil/fill and six tuff) were collected in 1996 and during the 2008–2009 investigation from seven locations at SWMU 32-001. Table 8.3-1 summarizes the samples collected and the requested analyses for each sample. Figure 8.3-1 is the site map showing sampling locations.

F-5.1.1 Inorganic Chemicals at SWMU 32-001

All 12 samples collected at SWMU 32-001 were analyzed for TAL metals. Ten samples also were analyzed for nitrate, perchlorate, and cyanide (total). Table 8.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 8.3-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 8.3-2.

F-5.1.1.1 Inorganic Chemicals in Soil

Six soil and fill samples from SWMU 32-001 were analyzed for TAL metals. Four samples were analyzed for cyanide (total), nitrate, and perchlorate.

Antimony was not detected, but had DLs (10.1 and 9.5 mg/kg) above the BV (0.83 mg/kg) and above the maximum background concentration of antimony in soil (1 mg/kg) in two of six soil and fill samples. Antimony is identified as a COPC in soil.

Cadmium was not detected above the BV (0.4 mg/kg), but had two DLs (0.63 and 0.59 mg/kg) exceed the BV. However, the DLs are less than the maximum background concentration of cadmium in soil (2.6 mg/kg). Cadmium is not identified as a COPC in soil.

Cobalt was detected above the BV (8.64 mg/kg) and above the maximum background concentration of cobalt in soil (9.5 mg/kg) in one of six soil and fill samples, at a concentration of 12.4 mg/kg. The box plot for cobalt in soil is presented in Figure F-5.1-1. Cobalt is identified as a COPC in soil.

Copper was detected above the BV (14.7 mg/kg) and above the maximum background concentration of copper in soil (16 mg/kg) in one of six soil and fill samples, at a concentration of 16.5 mg/kg. The box plot for copper in soil is presented in Figure F-5.1-2. Copper is identified as a COPC in soil.

Total cyanide was not detected above the BV (0.5 mg/kg), but has DLs (2.3 and 0.57 mg/kg) in two of four soil and fill samples. Results were compared only to the BV because a background dataset for total cyanide in soil is not available. Total cyanide is identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) in one of six soil and fill samples, at a concentration of 22.7 mg/kg. The sample result did not exceed the maximum background concentration of lead in soil (28 mg/kg). The box plot for lead in soil is presented in Figure F-5.1-3. Lead is not identified as a COPC in soil.

Manganese was detected above the BV (671 mg/kg) in one of six soil and fill samples, at a concentration of 780 mg/kg. The sample result did not exceed the maximum background concentration of manganese in soil (1100 mg/kg). The box plot for manganese in soil is presented in Figure F-5.1-4. Manganese is not identified as a COPC in soil.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in soil (also 0.1 mg/kg) in two of six soil and fill samples, with concentrations of 0.41 and 0.24 mg/kg. The box plot for mercury in soil is presented in Figure F-5.1-5. Mercury is identified as a COPC in soil.

Nitrate was detected in four samples and has no BV. Nitrate is identified as a COPC in soil.

Silver was not detected above the BV (1 mg/kg), but had DLs (2 and 1.9 mg/kg) above the BV in two of six and fill soil samples. Results were compared only to the BV because a background dataset for silver in soil is not available. Silver is identified as a COPC in soil.

Sodium was detected above the BV (915 mg/kg) in two of six soil and fill samples, with concentrations of 1130 and 1150 mg/kg. The sample results did not exceed the maximum background concentration of sodium in soil (1800 mg/kg). The box plot for sodium in soil is presented in Figure F-5.1-6. Sodium is not identified as a COPC in soil.

Zinc was detected above the BV (48.8 mg/kg) and above the maximum background concentration of zinc in soil (75.5 mg/kg) in one of six soil and fill samples, at a concentration of 79.3 mg/kg. The box plot for zinc in soil is presented in Figure F-5.1-7. Zinc is identified as a COPC in soil.

F-5.1.1.2 Inorganic Chemicals in Tuff

Six tuff samples from SWMU 32-001 were analyzed for TAL metals, cyanide (total), nitrate, and perchlorate.

Antimony was not detected, but has a DL (0.54 mg/kg) above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in tuff (0.4 mg/kg). The DL is only 8% above the BV. Because antimony only has a DL that is slightly and infrequently above background (one of six samples), it is not identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) in four of six tuff samples, with a maximum concentration of 184 mg/kg. Three of the four results also exceeded the maximum background concentration of barium in tuff (51.6 mg/kg). The box plot for barium in tuff is presented in Figure F-5.1-8. Barium is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum background concentration of calcium in tuff (2230 mg/kg) in three of six tuff samples, with a maximum concentration of 9770 mg/kg. The box plot for calcium in tuff is presented in Figure F-5.1-9. Calcium is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in all six tuff samples, with a maximum concentration of 18.8 mg/kg. Three of the six results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). The box plot for chromium in tuff is presented in Figure F-5.1-10. Chromium is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) and above the maximum background concentration of copper in tuff (6.2 mg/kg) in one of six tuff samples, at a concentration of 13.2 mg/kg. The box plot for copper in tuff is presented in Figure F-5.1-11. Copper is identified as a COPC in tuff.

Total cyanide was not detected, but had DLs (0.54–5.4 mg/kg) above the BV (0.5 mg/kg) in five of six tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in four of six tuff samples, with a maximum concentration of 12.1 mg/kg. The box plot for nickel in tuff is presented in Figure F-5.1-12. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in one or more tuff samples and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was not detected above the BV (0.3 mg/kg), but had DLs (0.34–0.62 mg/kg) above the BV and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in three of six tuff samples. The box plot for selenium in tuff is presented in Figure F-5.1-13. Selenium is identified as a COPC in tuff.

F-5.1.2 Organic Chemicals at SWMU 32-001

All 12 samples collected at SWMU 32-001 were analyzed for SVOCs and VOCs. Ten samples were analyzed for PCBs. Four samples were analyzed for dioxins and furans. Table 8.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 8.3-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 8.3-3.

F-5.1.2.1 Organic Chemicals in Soil

Six samples were collected from soil and fill and analyzed for organic chemicals. Each sample was analyzed for SVOCs and VOCs. Four samples were analyzed for dioxins and furans and PCBs.

Twenty-seven organic chemicals were detected in at least one sample from soil or fill and are identified as COPCs in soil: Aroclor-1260; cis-1,2-dichloroethene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; methylene chloride; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; total tetrachlorodibenzodioxins; total tetrachlorodibenzofurans; tetrachloroethene; and trichloroethene.

F-5.1.2.2 Organic Chemicals in Tuff

Six samples were collected from tuff and analyzed for dioxins and furans, PCBs, SVOCs, and VOCs.

Nine organic chemicals were detected in at least one sample from tuff and are identified as COPCs in tuff: acetone; bis(2-ethylhexyl)phthalate; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; methylene chloride; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene.

F-5.1.3 Radionuclides at SWMU 32-001

Ten samples collected at SWMU 32-001 were analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and strontium-90. Table 8.3-1 summarizes samples collected and the requested analyses for each sample.

Table 8.3-4 presents the detected radionuclides at depths for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 8.3-4.

F-5.1.3.1 Radionuclides in Soil

Four soil and fill samples from SWMU 32-001 were analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected in one soil sample at a depth that the FV does not apply, at a concentration of 0.047 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

Strontium-90 was detected in one soil sample at a depth where the FV does not apply, at a concentration of 0.274 pCi/g. Strontium-90 is identified as a COPC in soil.

F-5.1.3.2 Radionuclides in Tuff

Six tuff samples from SWMU 32-001 were analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and strontium-90.

No radionuclides were detected or detected above BV in tuff samples from SWMU 32-001.

F-5.1.4 Summary of COPCs at SWMU 32-001

The inorganic COPCs are antimony, barium, calcium, chromium, cobalt, copper, total cyanide, mercury, nickel, nitrate, perchlorate, selenium, silver, and zinc.

The organic COPCs are acetone; Aroclor-1260; bis(2-ethylhexyl)phthalate; cis-1,2-dichloroethene; methylene chloride; phenanthrene; tetrachloroethene; trichloroethene; and dioxins and furans (1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; total tetrachlorodibenzodioxins; total tetrachlorodibenzofurans).

The radionuclide COPCs are plutonium-239/240 and strontium-90.

F-5.1.5 Nature and Extent of Contamination at SWMU 32-001

F-5.1.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 32-001 are antimony, barium, calcium, chromium, cobalt, copper, total cyanide, mercury, nickel, nitrate, perchlorate, selenium, silver, and zinc. Sample results are presented in Table 8.3-2 and are shown in Figure 8.3-2.

Antimony, cyanide, selenium, and silver were not detected above BVs at the site. Therefore, the lateral and vertical extent for these COPCs are defined.

Concentrations of barium decrease with depth at one location, but barium is above the BV only in the deeper sample at two locations. Concentrations are less than 3 times the maximum tuff background

concentration (51.5 mg/kg), except at location 00-603578, where the concentration decreases with depth below the maximum (184 mg/kg). Concentrations decrease laterally from location 00-603578 to 00-603577. Therefore, the lateral and vertical extent for barium are defined.

Most concentrations of calcium are less than three times the BV. Concentrations decrease with depth at three locations, and decrease laterally from location 00-603578 to 00-603577. Therefore, the lateral and vertical extent for calcium are defined.

Chromium and nickel were detected above BVs in the deeper samples at four locations. Concentrations increase slightly with depth but are all less than twice the maximum tuff background concentration (13 mg/kg for chromium and 7 mg/kg for nickel). Therefore, the lateral and vertical extent for chromium and nickel are defined.

Cobalt, mercury, and zinc were detected above BVs in one or two samples collected in 1996. In samples collected during the 2008–2009 investigation at greater depths (and upslope, downslope, and on both sides of the 1996 samples), cobalt, mercury, and zinc were not detected above BVs. Therefore, the lateral and vertical extent for cobalt, mercury, and zinc are defined.

Copper was only detected above BV in two samples. The concentration in one sample is approximately 2 times the maximum tuff background concentration, and the concentration in the other sample is only slightly above the soil BV. Therefore, the lateral and vertical extent for copper are defined.

Nitrate was detected at all five locations sampled in 2008. Concentrations decreased or remained essentially the same at four locations, and increased slightly at location 00-603576. Concentrations are less than 5 mg/kg at location 00-603576. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected only in one sample at location 00-603578 with a concentration near the EDL. Perchlorate was not detected in the deepest sample at this location or in samples at other locations. Therefore, the lateral and vertical extent of perchlorate are defined.

F-5.1.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 32-001 are acetone; Aroclor-1260; bis(2-ethylhexyl)phthalate; cis-1,2-dichloroethene; methylene chloride; phenanthrene; tetrachloroethene; trichloroethene; and dioxins and furans (1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; total tetrachlorodibenzodioxins; total tetrachlorodibenzofurans). Sample results are presented in Table 8.3-3 and are shown on Figure 8.3-3.

The majority of detected concentrations, including all the dioxins and furans are at or below the EQLs, and concentrations decrease with depth at the five locations sampled in 2008–2009. Aroclor-1260 decreases with depth at all locations. Therefore, the lateral and vertical extent of organic COPCs are defined.

F-5.1.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs identified at SWMU 32-001 are plutonium-239/240 and strontium-90. Sample results are presented in Table 8.3-4 and are shown in Figure 8.3-4.

Plutonium-239/240 and strontium-90 were detected only in one sample (0.047 pCi/g and 0.274 pCi/g, respectively) and decrease with depth. Therefore, the lateral and vertical extent for plutonium-239/240 and strontium-90 are defined.

F-5.1.5.4 Summary of Nature and Extent for SWMU 32-001

The lateral and vertical extent for all inorganic, organic, and radionuclide COPCs are defined at SWMU 32-001.

F-5.2 SWMU 32-002(a)

A total of 31 samples (27 tuff and 4 soil) were collected from 21 locations in 1996 and 2008 at SWMU 32-002(a). Table 8.4-1 lists the samples collected and the requested analyses for each sample. Plate 8.4-1 is the site map showing sampling locations.

F-5.2.1 Inorganic Chemicals at SWMU 32-002(a)

All 31 samples were analyzed for TAL metals. Twenty samples were also analyzed for cyanide (total), nitrate, and perchlorate. Table 8.4-1 summarizes the samples collected and the requested analyses for each sample.

Table 8.4-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown on Plate 8.4-2.

F-5.2.1.1 Inorganic Chemicals in Soil

Four soil samples from SWMU 32-002(a) were analyzed for TAL metals.

Antimony was detected above the BV (0.83 mg/kg) in one of four soil samples, at a concentration of 11 mg/kg. Antimony also had DLs (6.8–130 mg/kg) above the BV in the other three soil samples. The sample result and the DLs also exceeded the maximum background concentration of antimony in soil (1 mg/kg). The box plot for antimony in soil is presented in Figure F-5.2-1. Antimony is identified as a COPC in soil.

Arsenic was detected above the BV (8.17 mg/kg) and above the maximum background concentration of arsenic in soil (9.3 mg/kg) in one of four soil samples, at a concentration of 13 mg/kg. The box plot for arsenic in soil is presented in Figure F-5.2-2. Arsenic is identified as a COPC in soil.

Barium was detected above the BV (295 mg/kg) and above the maximum background concentration of barium in soil (410 mg/kg) in one of four soil samples, at a concentration of 540 mg/kg. The box plot for barium in soil is presented in Figure F-5.2-3. Barium is identified as a COPC in soil.

Beryllium was not detected above the BV (1.83 mg/kg), but has a DL (6.3 mg/kg) above the BV and above the maximum background concentration of beryllium in soil (3.95 mg/kg). The box plot for beryllium in soil is presented in Figure F-5.2-4. Beryllium is identified as a COPC in soil.

Cadmium was not detected, but had DLs (0.56–6.3 mg/kg) above the BV (0.4 mg/kg) in all four soil samples. One of the four DLs also exceeded the maximum background concentration of cadmium in soil (2.6 mg/kg). Cadmium is identified as a COPC in soil.

Calcium was detected above the BV (6120 mg/kg) in one of four soil samples, at a concentration of 8900 mg/kg. The sample result did not exceed the maximum background concentration of calcium in soil (14000 mg/kg). The box plot for calcium in soil is presented in Figure F-5.2-5. Calcium is not identified as a COPC in soil.

Chromium was detected above the BV (19.3 mg/kg) and above the maximum background concentration of chromium in soil (36.5 mg/kg) in one of four soil samples, at a concentration of 150 mg/kg. The box plot for chromium in soil is presented in Figure F-5.2-6. Chromium is identified as a COPC in soil.

Copper was detected above the BV (14.7 mg/kg) and above the maximum background concentration of copper in soil (16 mg/kg) in one of four soil samples, at a concentration of 29 mg/kg. The box plot for copper in soil is presented in Figure F-5.2-7. Copper is identified as a COPC in soil.

Iron was detected above the BV (21,500 mg/kg) and above the maximum background concentration of iron in soil (36,000 mg/kg) in one of four soil samples, at a concentration of 93,000 mg/kg. The box plot for copper in soil is presented in Figure F-5.2-8. Iron is identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) in three of four soil samples, with a maximum concentration of 530 mg/kg. Two of three results also exceeded the maximum background concentration of lead in soil (28 mg/kg). Lead is interpreted as being substantially above background, and no further evaluation is necessary. Lead is identified as a COPC in soil.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in soil (also 0.1 mg/kg) in two of four soil samples, with concentrations of 43 and 1.2 mg/kg. Mercury also had a DL (0.11 mg/kg) above the BV. Mercury is interpreted as being substantially above background, and no further evaluation is necessary. Mercury is identified as a COPC in soil.

Nickel was detected above the BV (15.4 mg/kg) in one of four soil samples, at a concentration of 21 mg/kg. The sample result did not exceed the maximum background concentration of nickel in soil (29 mg/kg). The box plot for nickel in soil is presented in Figure F-5.2-9. Nickel is not identified as a COPC in soil.

Silver was detected above the BV (1 mg/kg) in one of four soil samples, at a concentration of 43 mg/kg. Silver also had DLs (1.7–2.4 mg/kg) above the BV in the other three soil samples. Results were compared only to the BV because a background dataset for silver in soil is not available. Silver is identified as a COPC in soil.

Sodium was detected above the BV (915 mg/kg) in three of four soil samples, with a maximum concentration of 12000 mg/kg. Three of the four results also exceeded the maximum background concentration of sodium in soil (1800 mg/kg). The box plot for sodium in soil is presented in Figure F-5.2-10. Sodium is identified as a COPC in soil.

Thallium was not detected, but had a DL (1.4 mg/kg) above the BV (0.73 mg/kg) and above the maximum background concentration of thallium in soil (1 mg/kg) in one of four soil samples. Thallium is identified as a COPC in soil.

Zinc was detected above the BV (48.8 mg/kg) in three of four soil samples, with a maximum concentration of 240 mg/kg. One of the three results also exceeded the maximum background concentration of zinc in

soil (75.5 mg/kg). The box plot for zinc in soil is presented in Figure F-5.2-11. Zinc is identified as a COPC in soil.

F-5.2.1.2 Inorganic Chemicals in Tuff

Twenty-seven tuff samples from SWMU 32-002(a) were analyzed for TAL metals. Twenty samples were analyzed for cyanide (total), nitrate, and perchlorate.

Aluminum was detected above the BV (7340 mg/kg) in 2 of 27 tuff samples, with concentrations of 7450 and 8100 mg/kg. Neither result exceeded the maximum background concentration of aluminum in tuff (8370 mg/kg). Statistical tests were performed to determine if the site sample results for aluminum are different than background. The statistical test results are presented in Table F-5.2-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for aluminum in tuff is presented in Figure F-5.2-12. Aluminum is not identified as a COPC in tuff.

Antimony was not detected, but had DLs (0.51–12 mg/kg) above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in 14 of 27 tuff samples. Antimony is identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) in 12 of 27 tuff samples, with a maximum concentration of 140 mg/kg. Eleven of the 12 results also exceeded the maximum background concentration of barium in tuff (51.6 mg/kg). Statistical tests were performed to determine if the site sample results for barium are different than background. The statistical test results are presented in Table F-5.2-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for barium in tuff is presented in Figure F-5.2-13. Barium is identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in 1 of 27 tuff samples, at a concentration of 1.4 mg/kg. The sample result did not exceed the maximum background concentration of beryllium in tuff (1.8 mg/kg). Statistical tests were performed to determine if the site sample results for beryllium are different than background. The statistical test results are presented in Table F-5.2-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for beryllium in tuff is presented in Figure F-5.2-14. Beryllium is not identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum background concentration of calcium in tuff (2230 mg/kg) in 5 of 27 tuff samples, with a maximum concentration of 4700 mg/kg. Statistical tests were performed to determine if the site sample results for calcium are different than background. The statistical test results are presented in Table F-5.2-1. The result of the Gehan test indicates that the site sample results are statistically different than background. However, all sample concentrations are less than three times the BV. Based on EPA's Risk Assessment Guidance for Superfund, section 5.9.4, page 5-23, calcium may be eliminated as a COPC if detected infrequently above background (5 of 27 samples) and not substantially above background. The box plot for calcium in tuff is presented in Figure F-5.2-15. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 12 of 27 tuff samples, with a maximum concentration of 29.4 mg/kg. Five of the 12 results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). Chromium also had a DL (8.1 mg/kg) above the BV, but did not exceed the maximum background concentration. Statistical tests were performed to determine if the site sample results for chromium are different than background. The statistical test results are presented in Table F-5.2-1. The result of the Gehan test indicates that the site sample results are statistically

different than background. The box plot for chromium in tuff is presented in Figure F-5.2-16. Chromium is identified as a COPC in tuff.

Cobalt was detected above the BV (3.14 mg/kg) and above the maximum background concentration of cobalt in tuff (also 3.14 mg/kg) in 2 of 27 tuff samples, with concentrations of 3.3 and 4.8 mg/kg. Statistical tests were performed to determine if the site sample results for cobalt are different than background. The statistical test results are presented in Table F-5.2-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for cobalt in tuff is presented in Figure F-5.2-17. Cobalt is not identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 8 of 27 tuff samples, with a maximum concentration of 8.2 mg/kg. Four of the eight results also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). Statistical tests were performed to determine if the site sample results for copper are different than background. The statistical test results are presented in Table F-5.2-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for copper in tuff is presented in Figure F-5.2-18. Copper is identified as a COPC in tuff.

Total cyanide was not detected above the BV (0.5 mg/kg), but had DLs (0.52–0.59 mg/kg) above the BV in 8 of 20 tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 12 of 27 tuff samples, with a maximum concentration of 110 mg/kg. Ten of the 12 results also exceeded the maximum background concentration of lead in tuff (15.5 mg/kg). Statistical tests were performed to determine if the site sample results for lead are different than background. The statistical test results are presented in Table F-5.2-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for lead in tuff is presented in Figure F-5.2-19. Lead is identified as a COPC in tuff.

Magnesium was detected above the BV (1690 mg/kg) in 1 of 27 tuff samples, at a concentration of 2140 mg/kg. The sample result did not exceed the maximum background concentration of magnesium in tuff (2820 mg/kg). Statistical tests were performed to determine if the site sample results for magnesium are different than background. The statistical test results are presented in Table F-5.2-1. The result of the Gehan test indicates that the site sample results are statistically different than background. However, all sample concentrations are less than twice the BV. Based on EPA's Risk Assessment Guidance for Superfund, section 5.9.4, page 5-23, magnesium may be eliminated as a COPC if detected infrequently above background (1 of 27 samples) and not substantially above background. The box plot for magnesium in tuff is presented in Figure F-5.2-20. Magnesium is not identified as a COPC in tuff.

Manganese was detected above the BV (482 mg/kg) and above the maximum background concentration of manganese in tuff (752 mg/kg) in 1 of 27 tuff samples, at a concentration of 830 mg/kg. Statistical tests were performed to determine if the site sample results for manganese are different than background. The statistical test results are presented in Table F-5.2-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for manganese in tuff is presented in Figure F-5.2-21. Manganese is not identified as a COPC in tuff.

Mercury was detected above the BV (0.1 mg/kg) in 6 of 27 tuff samples, with a maximum concentration of 0.546 mg/kg. Mercury also had DLs (0.11–0.23 mg/kg) above the BV in four tuff samples. Results were compared only to the BV because a background dataset for mercury in tuff is not available. Mercury is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in 14 of 27 tuff samples, with a maximum concentration of 14.6 mg/kg. Ten of the 14 results also exceeded the maximum background concentration of nickel in tuff (7 mg/kg). Statistical tests were performed to determine if the site sample results for nickel are different than background. The statistical test results are presented in Table F-5.2-1. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for nickel in tuff is presented in Figure F-5.2-22. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in multiple tuff samples and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was detected above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in 4 of 27 tuff samples, with a maximum concentration of 1 mg/kg. Selenium also had DLs (0.39–0.54 mg/kg) above the BV in three tuff samples. Statistical tests were not performed because the background data of selenium in Qbt 2,3,4 tuff are all nondetects. The box plot for selenium in tuff is presented in Figure F-5.2-23. Selenium is identified as a COPC in tuff.

Silver was not detected above the BV (1 mg/kg), but had DLs (2–2.4 mg/kg) above the BV and above the maximum background concentration of silver in tuff (1.9 mg/kg) in 5 of 27 tuff samples. Statistical tests were performed to determine if the site sample results for silver are different than background. The statistical test results are presented in Table F-5.2-1. The result of the quantile test indicates that the site sample results are not statistically different than background, while the result of the slippage test indicates that the site sample results are statistically different than background. The box plot for silver in tuff is presented in Figure F-5.2-24. Silver is identified as a COPC in tuff.

Sodium was detected above the BV (2770 mg/kg) in 1 of 27 tuff samples, at a concentration of 4900 mg/kg. The sample result did not exceed the maximum background concentration of sodium in tuff (7700 mg/kg). Statistical tests were performed to determine if the site sample results for sodium are different than background. The statistical test results are presented in Table F-5.2-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for sodium in tuff is presented in Figure F-5.2-25. Sodium is not identified as a COPC in tuff.

Thallium was detected above the BV (1.1 mg/kg) in 1 of 27 tuff samples, at a concentration of 1.3 mg/kg. The sample result did not exceed the maximum background concentration of thallium in tuff (1.7 mg/kg). Statistical tests were performed to determine if the site sample results for thallium are different than background. The statistical test results are presented in Table F-5.2-1. The results of both the quantile test and the slippage test indicate that the site sample results are not statistically different than background. The box plot for thallium in tuff is presented in Figure F-5.2-26. Thallium is not identified as a COPC in tuff.

Zinc was detected above the BV (63.5 mg/kg) and above the maximum background concentration of zinc in tuff (65.6 mg/kg) in 1 of 27 tuff samples, at a concentration of 102 mg/kg. Statistical tests were performed to determine if the site sample results for zinc are different than background. The statistical test results are presented in Table F-5.2-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for zinc in tuff is presented in Figure F-5.2-27. Zinc is not identified as a COPC in tuff.

F-5.2.2 Organic Chemicals at SWMU 32-002(a)

Twenty samples were analyzed for dioxins and furans and PCBs, and 29 samples were analyzed for SVOCs and VOCs. Table 8.4-1 summarizes samples collected and the requested analyses for each sample.

Table 8.4-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 8.4-3.

F-5.2.2.1 Organic Chemicals in Soil

Three soil samples from SWMU 32-002(a) were analyzed for SVOCs and VOCs.

Thirteen organic chemicals were detected in at least one sample from soil: acetone; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; dichlorodifluoromethane; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; and pyrene. All are identified as organic COPCs in soil at SWMU 32-002(a). All are identified as organic COPCs in soil at SWMU 32-002(a).

F-5.2.2.2 Organic Chemicals in Tuff

Twenty-six tuff samples from SWMU 32-002(a) were analyzed for SVOCs and VOCs. Twenty samples were also analyzed for dioxins and furans and PCBs.

Forty-six organic chemicals were detected in at least one sample from tuff and are identified as organic COPCs in tuff: acetone; Aroclor-1260; acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; carbazole; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; methylene chloride; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; and trichlorofluoromethane.

F-5.2.3 Radionuclide at SWMU 32-002(a)

Thirty samples were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium. Twenty samples were analyzed for americium-241 and strontium-90. Table 8.4-1 summarizes samples collected and the requested analyses for each sample.

Table 8.4-4 presents the radionuclides that were detected above BVs/FVs and the radionuclides that have no BVs/FVs. The sampling locations and detected concentrations are shown on Plate 8.4-4.

F-5.2.3.1 Radionuclides in Soil

Four samples were collected from soil, and three were analyzed for radionuclides by gamma spectroscopy and for isotopic plutonium, isotopic uranium, and tritium.

Plutonium-238 was detected above the FV (0.023 pCi/g) and above the maximum background concentration of plutonium-239/240 in surface soil (0.037 pCi/g) in one of four surface soil samples, at a concentration of 0.079 pCi/g. The box plot of plutonium-238 in surface soil is presented in Figure F-5.2-28. Plutonium-238 is identified as a COPC in soil.

Plutonium-239/240 was detected above the FV (0.054 pCi/g) and above the maximum background concentration of plutonium-239/240 in surface soil (0.055 pCi/g) in one of four surface soil samples, at a concentration of 0.109 pCi/g. The box plot for plutonium-239/240 in surface soil is presented in Figure F-5.2-29. Plutonium-239/240 is identified as a COPC in soil.

Tritium was detected in one of four soil samples at a concentration of 0.0999 pCi/g, and has no soil FV. Tritium is identified as a COPC in soil.

F-5.2.3.2 Radionuclides in Tuff

Twenty-seven samples were collected from tuff. Each sample was analyzed for radionuclides by gamma spectroscopy and for isotopic plutonium and isotopic uranium. Twenty-six samples were analyzed for tritium. Twenty samples were analyzed for strontium-90.

Cesium-137 was detected in 4 of 27 tuff samples with a maximum concentration of 1.7 pCi/g, and has no tuff FV. Cesium-137 is identified as a COPC in tuff.

Plutonium-239/240 was detected in 5 of 27 tuff samples with a maximum concentration of 2.7 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in 1 of 27 tuff samples, at a concentration of 0.126 pCi/g. Results were compared only to the BV because background dataset for uranium-235/236 in tuff is not available. Uranium-235/236 is identified as a COPC in tuff.

F-5.2.4 Summary of COPCs at SWMU 32-002(a)

The inorganic COPCs are antimony, arsenic, barium, beryllium, cadmium, chromium, copper, total cyanide, iron, lead, mercury, nickel, nitrate, perchlorate, selenium, silver, sodium, thallium, and zinc.

The organic COPCs are Aroclor-1260; acetone; acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; carbazole; chrysene; dibenz(a,h)anthracene; dibenzofuran; dichlorodifluoromethane; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; methylene chloride; naphthalene; phenanthrene; pyrene; trichlorofluoromethane; and dioxins and furans (1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran;

1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans).

The radionuclide COPCs are cesium-137, plutonium-238, plutonium-239/240, tritium, and uranium-235/236.

F-5.2.5 Nature and Extent of Contamination at SWMU 32-002(a)

F-5.2.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 32-002(a) are antimony, arsenic, barium, beryllium, cadmium, chromium, copper, total cyanide, iron, lead, mercury, nickel, nitrate, perchlorate, selenium, silver, sodium, thallium, and zinc. Sample results are presented in Table 8.4-2 and are shown on Plate 8.4-2.

Substantially elevated concentrations of TAL metals were detected at location 32-06373, at the top of SWMU 32-002(a). However, lateral and vertical extent are defined by samples at nearby locations 32-06375 and 00-603580.

Antimony, arsenic, cadmium, iron, silver, sodium, and thallium were not detected above BVs at locations sampled in 2008–2009. Samples were collected during the 2008–2009 investigation near each previous sampling location along the pipeline to define the lateral and vertical extent. Therefore, the extent is defined for these COPCs.

Concentrations of barium increase with depth at several locations. It was not detected above the BV in the deepest sample at downslope location 00-603583. Therefore, the lateral extent of barium is defined, but the vertical extent is not defined.

Beryllium was detected above the BV in only one sample, at a concentration slightly above BV. Therefore, the lateral and vertical extent of beryllium are defined.

Cadmium and cyanide were not detected at the site. Therefore, the lateral and vertical extent of cadmium and cyanide are defined.

Concentrations of chromium and nickel increase with depth at multiple locations. Concentrations decrease downslope. Therefore, the lateral extent of chromium and nickel is defined, but the vertical extent of chromium and nickel is not defined.

Concentrations of copper are all less than twice the BV at the site, except for the sample at location 32-06373. Therefore, the lateral and vertical extent for copper are defined.

Concentrations of lead in samples collected in this investigation are all less than twice the maximum tuff background concentration (15.5 mg/kg). Higher concentrations were detected above BV in two historical samples at locations 32-06369 and 32-06373, but lateral and vertical extent are defined by nearby samples collected in this investigation at locations 00-603582 and 00-603580.

Concentrations of mercury decrease with depth, and generally decrease downslope. The lateral and vertical extent of mercury is defined.

Nitrate was detected in multiple samples at concentrations less than 5 mg/kg except that one sample had a concentration of 6.6 mg/kg. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected in eight samples with majority of the concentrations near EDLs. Perchlorate was not detected in samples from downslope locations. Therefore, the lateral and vertical extent of perchlorate are defined.

Selenium was detected in four samples at the site with concentrations ranging from 0.34 to 1 mg/kg. Selenium was not detected above the BV at all downslope locations from location 32-06353. The lateral and vertical extent of selenium are defined.

Zinc was detected above BV in four samples from locations 32-06373, 32-06374, 32-06375, and 00-603585. The lateral and vertical extent of zinc at locations 32-06373 and 32-06375 are defined by 2008 samples at location 00-603580. Zinc concentration decreases with depth at location 00-603585. The lateral and/or vertical extent of zinc at locations 32-06374 and 00-603585 are defined because zinc was not detected above the BV at downslope locations from location 00-603585. Therefore, the lateral and vertical extent of zinc are defined at SWMU 32-002(a).

F-5.2.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 32-002(a) are Aroclor-1260; acetone; acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; carbazole; chrysene; dibenz(a,h)anthracene; dibenzofuran; dichlorodifluoromethane; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; methylene chloride; naphthalene; phenanthrene; pyrene; trichlorofluoromethane; and dioxins and furans (1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans). Sample results are presented in Table 8.4-3 and are shown on Plate 8.4-3.

Concentrations of organic COPCs, including all the dioxins and furans, are at or below the EQLs in samples collected during the 2008–2009 investigation. Relatively high concentrations of PAHs were detected in the sample at the deeper depth at location 32-06371. However, the lateral and vertical extent are defined by the nearby location 00-603583, where samples were collected at greater depths in 2008–2009. Therefore, the lateral and vertical extent of organic COPCs are defined.

F-5.2.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs identified at SWMU 32-002(a) are cesium-137, plutonium-238, plutonium-239/240, tritium, and uranium-235/236. Sample results are presented in 8.4-4 and are shown on Plate 8.4-4.

Concentrations of cesium-137 decrease with depth and all are at low levels (< 0.5 pCi/g). Concentrations of cesium-137 decrease downslope. The lateral and vertical extent of cesium-137 are defined.

Plutonium-238, tritium, and uranium-235/236 were not detected or detected above BV in samples collected in 2008–2009. They were each detected or detected above BVs/FVs in only one previous

sample, at low concentrations. Therefore, the lateral and vertical extent of plutonium-238, tritium, and uranium-235/236 are defined.

Plutonium-239/240 was detected in only one sample collected during the 2008–2009 investigation, and concentrations decrease with depth. It was detected or detected above FV at several previous locations, but lateral and vertical extent are defined by nearby locations sampled in 2008–2009. Therefore, the lateral and vertical extent of plutonium-239/240 are defined.

F-5.2.5.4 Summary of Nature and Extent for SWMU 32-002(a)

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined at SWMU 32-002(a), with the exception of the vertical extent of barium, chromium, and nickel.

F-5.3 SWMU 32-002(b)

A total of 38 samples (9 soil and 29 tuff) were collected from 25 locations in 1996 and 2008 at SWMU 32-002(b). Table 8.5-1 lists the samples collected and the analyses requested for each sample. Plate 8.4-1 is the site map showing sampling locations.

F-5.3.1 Inorganic Chemicals at SWMU 32-002(b)

All 38 samples were analyzed for TAL metals. Twenty-two samples were also analyzed for cyanide (total), nitrate, and perchlorate. Table 8.5-1 summarizes samples collected and the requested analyses for each sample.

Table 8.5-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown on Plate 8.4-2.

F-5.3.1.1 Inorganic Chemicals in Soil

Nine soil samples from SWMU 32-002(b) were analyzed for TAL metals. One sample was also analyzed for cyanide (total), nitrate, and perchlorate.

Antimony was not detected, but had DLs (10–12 mg/kg) above the BV (0.83 mg/kg) and above the maximum background concentration of antimony in soil (1 mg/kg) in eight of nine soil samples. Antimony is identified as a COPC in soil.

Cadmium was detected above the BV (0.4 mg/kg) in three of nine soil samples, with a maximum concentration of 2.1 mg/kg. Cadmium also had DLs (0.51–0.59 mg/kg) above the BV in five soil samples. None of the results exceeded the maximum background concentration of cadmium in soil (2.6 mg/kg). The box plot for cadmium in soil is presented in Figure F-5.3-1. Cadmium is not identified as a COPC in soil.

Chromium was detected above the BV (19.3 mg/kg) in three of nine soil samples, with a maximum concentration of 84 mg/kg. Two of the three results also exceeded the maximum background concentration of chromium in soil (36.5 mg/kg). The box plot for chromium in soil is presented in Figure F-5.3-2. Chromium is identified as a COPC in soil.

Copper was detected above the BV (14.7 mg/kg) and above the maximum background concentration of copper in soil (16 mg/kg) in two of nine soil samples, with concentrations of 27 and 31 mg/kg. The box plot for copper in soil is presented in Figure F-5.3-3. Copper is identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) and above the maximum background concentration of lead in soil (28 mg/kg) in seven of nine soil samples, with a maximum concentration of 220 mg/kg. Lead is interpreted as being substantially above background, and no further evaluation is necessary. Lead is identified as a COPC in soil.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in soil (also 0.1 mg/kg) in seven of nine soil samples, with a maximum concentration of 48 mg/kg. Mercury also had a DL (0.12 mg/kg) above the BV. Mercury is interpreted as being substantially above background, and no further evaluation is necessary. Mercury is identified as a COPC in soil.

Nitrate was detected in one soil sample and has no BV. Nitrate is identified as a COPC in soil.

Silver was detected above the BV (1 mg/kg) in four of nine soil samples, with a maximum concentration of 21 mg/kg. Silver also had DLs (2–2.4 mg/kg) above the BV in four soil samples. Results were compared only to the BV because a background dataset for silver in soil is not available. Silver is identified as a COPC in soil.

Thallium was not detected, but had DLs (1.3–2.4 mg/kg) above the BV (0.73 mg/kg) and above the maximum background concentration of thallium in soil (1 mg/kg) in eight of nine soil samples. Thallium is identified as a COPC in soil.

Zinc was detected above the BV (48.8 mg/kg) in four of nine soil samples, with a maximum concentration of 190 mg/kg. Two of the four results also exceeded the maximum background concentration of zinc in soil (75.5 mg/kg). The box plot for zinc in soil is presented in Figure F-5.3-4. Zinc is identified as a COPC in soil.

F-5.3.1.2 Inorganic Chemicals in Tuff

Twenty-nine tuff samples from SWMU 32-002(b) were analyzed for TAL metals. Twenty-one samples were also analyzed for cyanide (total), nitrate, and perchlorate.

Antimony was not detected, but had DLs (0.51–12 mg/kg) above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in 16 of 29 tuff samples. Antimony is identified as a COPC in tuff.

Arsenic was detected above the BV (2.79 mg/kg) in 4 of 29 tuff samples, with a maximum concentration of 7.5 mg/kg. Two of the four results also exceeded the maximum background concentration of arsenic in tuff (5 mg/kg). Statistical tests were performed to determine if the site sample results for arsenic are different than background. The statistical test results are presented in Table F-5.3-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for arsenic in tuff is presented in Figure F-5.3-5. Arsenic is identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) in 11 of 29 tuff samples, with a maximum concentration of 220 mg/kg. Ten of the 11 results also exceeded the maximum background concentration of barium in tuff (51.6 mg/kg). Statistical tests were performed to determine if the site sample results for barium are different than background. The statistical test results are presented in Table F-5.3-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for barium in tuff is presented in Figure F-5.3-6. Barium is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum background concentration of calcium in tuff (2230 mg/kg) in 2 of 29 tuff samples, with concentrations of 4700 and 2500 mg/kg.

Statistical tests were performed to determine if the site sample results for calcium are different than background. The statistical test results are presented in Table F-5.3-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for calcium in tuff is presented in Figure F-5.3-7. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 21 of 29 tuff samples, with a maximum concentration of 60.7 mg/kg. Fourteen of the 21 results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). Chromium is interpreted as being substantially above background, and no further evaluation is necessary. Chromium is identified as a COPC in tuff.

Cobalt was detected above the BV (3.14 mg/kg) and above the maximum background concentration of cobalt in tuff (also 3.14 mg/kg) in 2 of 29 tuff samples, with both concentrations being 3.6 mg/kg. Statistical tests were performed to determine if the site sample results for cobalt are different than background. The statistical test results are presented in Table F-5.3-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for cobalt in tuff is presented in Figure F-5.3-8. Cobalt is not identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 12 of 29 tuff samples, with a maximum concentration of 8.4 mg/kg. Four of the 12 results also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). Statistical tests were performed to determine if the site sample results for copper are different than background. The statistical test results are presented in Table F-5.3-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for copper in tuff is presented in Figure F-5.3-9. Copper is identified as a COPC in tuff.

Total cyanide was not detected, but had DLs (0.51–0.59 mg/kg) above the BV (0.5 mg/kg) in five of 21 tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 16 of 29 tuff samples, with a maximum concentration of 71 mg/kg. Twelve of the 16 results also exceeded the maximum background concentration of lead in tuff (15.5 mg/kg). Lead is interpreted as being substantially above background, and no further evaluation is necessary. Lead is identified as a COPC in tuff.

Manganese was detected above the BV (482 mg/kg) and above the maximum background concentration of manganese in tuff (752 mg/kg) in 1 of 29 tuff samples, at a concentration of 830 mg/kg. Statistical tests were performed to determine if the site sample results for manganese are different than background. The statistical test results are presented in Table F-5.3-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for manganese in tuff is presented in Figure F-5.3-10. Manganese is identified as a COPC in tuff.

Mercury was detected above the BV (0.1 mg/kg) in 15 of 28 tuff samples, with a maximum concentration of 6.4 mg/kg. Mercury also had a DL (0.11 mg/kg) above the BV. Results were compared only to the BV because a background dataset for mercury in tuff is not available. Mercury is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in 14 of 29 tuff samples, with a maximum concentration of 28.5 mg/kg. Statistical tests were performed to determine if the site sample results for nickel are different than background. The statistical test results are presented in Table F-5.3-1. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for nickel in tuff is presented in Figure F-5.3-11. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in tuff samples and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was detected above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in 12 of 29 tuff samples, with a maximum concentration of 1 mg/kg. Selenium also had DLs (0.56–1 mg/kg) above the BV in five tuff samples. Statistical tests were not performed because the background data of selenium in Qbt 2,3,4 tuff are all nondetects. The box plot for selenium in tuff is presented in Figure F-5.3-12. Selenium is identified as a COPC in tuff.

Silver was detected above the BV (1 mg/kg) in 6 of 29 tuff samples, with a maximum concentration of 6.7 mg/kg. Five of the six results also exceeded the maximum background concentration of silver in tuff (1.9 mg/kg). Statistical tests were performed to determine if the site sample results for silver are different than background. The statistical test results are presented in Table F-5.3-1. The result of the quantile test indicates that the site sample results are not statistically different than background, while the result of the slippage test indicates that the site sample results are statistically different than background. The box plot for silver in tuff is presented in Figure F-5.3-13. Silver is identified as a COPC in tuff.

Thallium was detected above the BV (1.1 mg/kg) in 1 of 29 tuff samples, at a concentration of 1.3 mg/kg. The sample result did not exceed the maximum background concentration of thallium in tuff (1.7 mg/kg). Thallium also had DLs (1.3–2.1 mg/kg) above the BV in six tuff samples. Two of the six DLs exceeded the maximum background concentration. Statistical tests were performed to determine if the site sample results for thallium are different than background. The statistical test results are presented in Table F-5.3-1. The results of both the quantile test and the slippage test indicate that the site sample results are not statistically different than background. The box plot for thallium in tuff is presented in Figure F-5.3-14. Thallium is not identified as a COPC in tuff.

Zinc was detected above the BV (63.5 mg/kg) and above the maximum background concentration of zinc in tuff (65.6 mg/kg) in 3 of 29 tuff samples, with a maximum concentration of 98.7 mg/kg. Statistical tests were performed to determine if the site sample results for zinc are different than background. The statistical test results are presented in Table F-5.3-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for zinc in tuff is presented in Figure F-5.3-15. Zinc is not identified as a COPC in tuff.

F-5.3.2 Organic Chemicals at SWMU 32-002(b)

Twenty-two samples were analyzed for PCBs, 34 samples were analyzed for SVOCs, and 15 samples were analyzed for VOCs. Table 8.5-1 summarizes samples collected and the requested analyses for each sample.

Table 8.5-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 8.4-3.

F-5.3.2.1 Organic Chemicals in Soil

Nine soil samples were analyzed for organic chemicals. Eight samples were also analyzed for SVOCs. One sample was also analyzed for dioxins/furans, PCBs, and VOCs.

Twenty-eight organic chemicals were detected in one sample from soil and are identified as COPCs in soil: benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k)fluoranthene; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total

heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; and total tetrachlorodibenzofurans.

F-5.3.2.2 Organic Chemicals in Tuff

Twenty-nine tuff samples were analyzed for organic chemicals. Twenty-one samples were analyzed for dioxins/furans and PCBs. Twenty-six samples were analyzed for SVOCs. Twenty-four samples were analyzed for VOCs.

Forty-two organic chemicals were detected in at least one sample from tuff and are identified as COPCs in tuff: Aroclor-1260; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; carbazole; chrysene; di-n-butylphthalate; dibenz(a,h)anthracene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; methylene chloride; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; phenanthrene; pyrene; total pentachlorodibenzofurans; total tetrachlorodibenzofurans; tetrachloroethene; and trichlorofluoromethane.

F-5.3.3 Radionuclides at SWMU 32-002(b)

All 38 samples were analyzed for isotopic plutonium and isotopic uranium. Twenty-nine samples were also analyzed for americium-241, 31 samples for gamma-emitting radionuclides, 32 samples for tritium, and 33 samples for strontium-90. Table 8.5-1 summarizes samples collected and the requested analyses for each sample.

Table 8.5-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations are shown on Plate 8.4-4.

F-5.3.3.1 Radionuclides in Soil

Nine soil samples from SWMU 32-002(b) were analyzed for isotopic plutonium and isotopic uranium. Six samples were also analyzed for americium-241 and tritium. Four samples were also analyzed for gamma-emitting radionuclides. One sample was also analyzed for strontium-90.

Americium-241 was detected above the FV (0.013 pCi/g) and above the maximum background concentration of americium-241 in soil (also 0.013 pCi/g) in three of seven surface soil samples, with a maximum concentration of 1.07 pCi/g. The box plot for americium-241 in surface soil is presented in Figure F-5.3-16. Americium-241 is identified as a COPC in soil.

Cesium-137 was detected above the FV (1.65 pCi/g) and above the maximum background concentration of cesium-137 in soil (1.7 pCi/g) in one of four surface soil samples, at a concentration of 2.56 pCi/g. The box plot for cesium-137 in surface soil is presented in Figure F-5.3-17. Cesium-137 is identified as a COPC in soil.

Plutonium-239/240 was detected above the FV (0.054 pCi/g) and above the maximum background concentration of plutonium-239/240 in surface soil (0.055 pCi/g) in all seven surface soil samples, with a maximum concentration of 5 pCi/g. Plutonium-239/240 was also detected in the other two soil samples at depths where the FV does not apply, with concentrations of 0.134 and 0.495 pCi/g. Plutonium-239/240 is interpreted as being substantially different than background, and no further evaluation is necessary. Plutonium-239/240 is identified as a COPC in soil.

Uranium-234 was detected above the BV (2.59 pCi/g) in one of nine soil samples at a concentration of 3.55 pCi/g. Results were compared only to the BV because background dataset for uranium-234 in soil is not available. Uranium-234 is identified as a COPC in soil.

Uranium-238 was detected above the BV (2.29 pCi/g) in one of nine soil samples at a concentration of 3.04 pCi/g. Results were compared only to the BV because background dataset for uranium-238 in soil is not available. Uranium-238 is identified as a COPC in soil.

F-5.3.3.2 Radionuclides in Tuff

Twenty-nine tuff samples from SWMU 32-002(b) were analyzed for isotopic plutonium and isotopic uranium. Twenty-three samples were also analyzed for americium-241. Twenty-seven samples were also analyzed for gamma-emitting radionuclides. Twenty-six samples were also analyzed for tritium. Twenty-one samples were also analyzed for strontium-90.

Cesium-137 was detected in 4 of 27 tuff samples with a maximum concentration of 1.7 pCi/g, and has no tuff FV. Cesium-137 is identified as a COPC in tuff.

Plutonium-239/240 was detected in 9 of 29 tuff samples with a maximum concentration of 0.356 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

Strontium-90 was detected in 1 of 21 tuff sample at a concentration of 0.45 pCi/g, and has no tuff FV. Strontium-90 is identified as a COPC in tuff.

Tritium was detected in 1 of 26 tuff samples at a concentration of 0.09 pCi/g, and has no tuff FV. Tritium is identified as a COPC in tuff.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in 3 of 29 tuff samples, with a maximum concentration of 0.119 pCi/g. Results were compared only to the BV because background dataset for uranium-235/236 in tuff is not available. Uranium-235/236 is identified as a COPC in tuff.

F-5.3.4 Summary of COPCs at SWMU 32-002(b)

The inorganic COPCs are antimony, arsenic, barium, chromium, copper, total cyanide, lead, manganese, mercury, nickel, nitrate, perchlorate, selenium, silver, thallium, and zinc.

The organic COPCs are Aroclor-1260; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; carbazole; chrysene; di-n-butylphthalate;

dibenz(a,h)anthracene; fluoranthene; indeno(1,2,3-cd)pyrene; methylene chloride; phenanthrene; pyrene; tetrachloroethene; trichlorofluoromethane; and dioxins and furans (1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; total tetrachlorodibenzofurans).

The radionuclide COPCs are americium-241, cesium-137, plutonium-239/240, strontium-90, tritium, uranium-234, uranium-235/236, and uranium-238.

F-5.3.5 Nature and Extent of Contamination at SWMU 32-002(b)

F-5.3.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 32-002(b) are antimony, arsenic, barium, chromium, copper, total cyanide, lead, manganese, mercury, nickel, nitrate, perchlorate, selenium, silver, thallium, and zinc. Sample results are presented in Table 8.5-2 and are shown on Plate 8.4-2.

Antimony, cyanide, and thallium were not detected at the site. Therefore, the lateral and vertical extent of antimony, cyanide, and thallium are defined.

Concentrations of arsenic decrease with depth and downslope. Therefore, the lateral and vertical extent of arsenic are defined.

Concentrations of barium increase with depth at locations 00-603589 and 00-603595, with concentration in the deeper sample at location 00-603595 substantially higher than BV. Concentrations of barium decrease downslope. Therefore, the lateral extent of barium is defined, but the vertical extent is not defined.

Concentrations of chromium and nickel increase with depth at multiple locations. Some concentrations are more than 3 times the maximum tuff background concentration (13 mg/kg for chromium and 7 mg/kg for nickel). Therefore, the lateral and vertical extent of chromium and nickel are not defined.

Concentrations of copper, lead, and silver decrease with depth and downslope. The lateral and vertical extent of copper, lead, and silver are defined.

Manganese was detected in only one sample at a concentration less than twice the BV. Manganese was not detected above the BV at any of the downslope locations. Therefore, the lateral and vertical extent of manganese are defined.

Mercury was detected above the BV at multiple locations. Concentrations decrease or do not change substantially with depth, except at location 00-603595. Lower concentrations were detected in samples from greater depths at downslope location 00-603594. Therefore, the lateral and vertical extent of mercury are defined.

Nitrate was detected in multiple samples at concentrations less than 5 mg/kg except that one sample had a concentration of 8.5 mg/kg. Nitrate at these concentrations are likely naturally occurring and

concentrations decrease with depth at all locations. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected in three samples at low levels and was not detected in samples from downslope locations. Therefore, the lateral and vertical extent of perchlorate are defined.

Selenium was detected at concentrations slightly above BV, except for one sample at location 32-06353, where it was detected at 1 mg/kg. Lower concentrations were detected in deeper samples at downslope location 00-603593. Therefore, the lateral and vertical extent of selenium are defined.

Concentrations of zinc are all less than twice the BV, except for one sample at location 32-06313, where it was detected at 190 mg/kg. Concentrations decrease with depth at this location, and lower concentrations were detected in downslope samples. Therefore, the lateral and vertical extent of zinc are defined.

F-5.3.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 32-002(b) are Aroclor-1260; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; carbazole; chrysene; di-n-butylphthalate; dibenz(a,h)anthracene; fluoranthene; indeno(1,2,3-cd)pyrene; methylene chloride; phenanthrene; pyrene; tetrachloroethene; trichlorofluoromethane; and dioxins and furans (1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; total tetrachlorodibenzofurans). Sample results are presented in Table 8.5-3 and are shown on Plate 8.4-3.

The majority of detections, including all the dioxins and furans, are at or below the EQLs. Concentrations decrease with depth at all locations, except for bis(2-ethylhexyl)phthalate at location 00-603596 and methylene chloride at locations 00-603594 and 00-603599. The lateral and vertical extent are defined by downslope samples. Therefore, the lateral and vertical extent of all organic COPCs are defined.

F-5.3.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs identified at SWMU 32-002(b) are americium-241, cesium-137, plutonium-239/240, strontium-90, tritium, uranium-234, uranium-235/236, and uranium-238. Sample results are presented in Table 8.5-4 and are shown on Plate 8.4-4.

Amerium-241 was not detected in samples collected in 2008–2009. It was detected in historical samples collected downslope from the outfall. It was not detected at the farthest downslope location 00-603599. Therefore, the lateral and vertical extent of americium-241 are defined.

Cesium-137 was detected (0.32 pCi/g) in only one sample collected for this investigation, and decreases with depth. It was detected in historical samples on the canyon slope. However, it was not detected at the

farthest downslope location (00-603599). Therefore, the lateral and vertical extent of americium-241 are defined.

Plutonium-239/240 was detected at low levels (< 0.3 pCi/g) in samples collected during the 2008–2009 investigation, and decrease with depth. Plutonium-239/240 was detected in historical samples on the canyon slope. However, it was not detected at the farthest downslope location (00-603599). Therefore, the lateral and vertical extent of plutonium-239/240 are defined.

Stronium-90 was detected (0.45 pCi/g) in only one sample collected for this investigation and was not detected at the farthest downslope location (00-603599). Therefore, the lateral and vertical extent of strontium-90 are defined.

Tritium, uranium-234, and uranium-238 were not detected or detected above BV in this investigation. Each was detected in only one historical sample; the concentration of tritium was 0.09 pCi/g and concentrations of uranium-234 and uranium-238 are only slightly above BVs. Therefore, the lateral and vertical extent of tritium, uranium-234, and uranium-238 are defined.

Uranium-235/236 was detected above the BV in three samples, at concentrations only slightly above the BV. Therefore, the lateral and vertical extent of uranium-235/236 are defined.

F-5.3.5.4 Summary of Nature and Extent for SWMU 32-002(b)

The lateral and vertical extent of all inorganic COPCs are defined at SWMU 32-002(b), except for the vertical extent of barium and the lateral and vertical extent of chromium and nickel.

The lateral and vertical extent of all organic and radionuclide COPCs are defined at SWMU 32-002(b).

F-5.4 AOC 32-003

A total of 24 samples (4 soil and 20 tuff) were collected in 2008 from 12 locations at AOC 32-003. Table 8.6-1 lists the samples collected and the analyses requested for each sample. Figure 8.6-1 is the site map showing sampling locations.

F-5.4.1 Inorganic Chemicals at AOC 32-003

All 24 samples were analyzed for TAL metals. Table 8.6-1 summarizes samples collected and the requested analyses for each sample.

Table 8.6-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 8.6-2.

F-5.4.1.1 Inorganic Chemicals in Soil

Four soil samples from AOC 32-003 were analyzed for TAL metals.

Lead was detected above the BV (22.3 mg/kg) in one of four soil samples, at a concentration of 24.1 mg/kg. The sample result did not exceeded the maximum background concentration of lead in soil (28 mg/kg). The box plot for lead in soil is presented in Figure F-5.4-1. Lead is not identified as a COPC in soil.

Sodium was detected above the BV (915 mg/kg) and above the maximum background concentration of sodium in soil (1800 mg/kg) in one of four soil samples, at a concentration of 1970 mg/kg. The box plot for sodium in soil is presented in Figure F-5.4-2. Sodium is identified as a COPC in soil.

Zinc was detected above the BV (48.8 mg/kg) and above the maximum background concentration of zinc in soil (75.5 mg/kg) in two of four soil samples, with concentrations of 81.3 and 90.4 mg/kg. The box plot for zinc in soil is presented in Figure F-5.4-3. Zinc is identified as a COPC in soil.

F-5.4.1.2 Inorganic Chemicals in Tuff

Twenty tuff samples from AOC 32-003 were analyzed for TAL metals.

Aluminum was detected above the BV (7340 mg/kg) and above the maximum background concentration of aluminum in tuff (8370 mg/kg) in 1 of 20 tuff samples, at a concentration of 14100 mg/kg. Statistical tests were performed to determine if the site sample results for aluminum are different than background. The statistical test results are presented in Table F-5.4-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for aluminum in tuff is presented in Figure F-5.4-4. Aluminum is not identified as a COPC in tuff.

Antimony was not detected, but had DLs (0.52–1.3 mg/kg) above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in 11 of 20 tuff samples. Antimony is identified as a COPC in tuff.

Arsenic was detected above the BV (2.79 mg/kg) in 1 of 20 tuff samples, at a concentration of 4.5 mg/kg. The sample result did not exceed the maximum background concentration of arsenic in tuff (5 mg/kg). Statistical tests were performed to determine if the site sample results for arsenic are different than background. The statistical test results are presented in Table F-5.4-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for arsenic in tuff is presented in Figure F-5.4-5. Arsenic is not identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) in 3 of 20 tuff samples, with a maximum concentration of 144 mg/kg. Two of the three results also exceeded the maximum background concentration of barium in tuff (51.6 mg/kg). Statistical tests were performed to determine if the site sample results for barium are different than background. The statistical test results are presented in Table F-5.4-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for barium in tuff is presented in Figure F-5.4-6. Barium is not identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) and above the maximum background concentration of beryllium in tuff (1.8 mg/kg) in 1 of 20 tuff samples, at a concentration of 1.9 mg/kg. Statistical tests were performed to determine if the site sample results for beryllium are different than background. The statistical test results are presented in Table F-5.4-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for beryllium in tuff is presented in Figure F-5.4-7. Beryllium is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 16 of 20 tuff samples, with a maximum concentration of 65.9 mg/kg. Ten of the 16 results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). Chromium is interpreted as being substantially different than background, and no further evaluation is necessary. Chromium is identified as a COPC in tuff.

Cobalt was detected above the BV (3.14 mg/kg) and above the maximum background concentration of cobalt in tuff (also 3.14 mg/kg) in 1 of 20 tuff samples, at a concentration of 5 mg/kg. Statistical tests were performed to determine if the site sample results for cobalt are different than background. The statistical test results are presented in Table F-5.4-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for cobalt in tuff is presented in Figure F-5.4-8. Cobalt is not identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 2 of 14 tuff samples, with concentrations of 8.2 and 5.7 mg/kg. One of two results also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). Statistical tests were performed to determine if the site sample results for copper are different than background. The statistical test results are presented in Table F-5.4-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for copper in tuff is presented in Figure F-5.4-9. Copper is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 3 of 20 tuff samples, with a maximum concentration of 26.2 mg/kg. One of the three results also exceeded the maximum background concentration of lead in tuff (15.5 mg/kg). Statistical tests were performed to determine if the site sample results for lead are different than background. The statistical test results are presented in Table F-5.4-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for lead in tuff is presented in Figure F-5.4-10. Lead is not identified as a COPC in tuff.

Magnesium was detected above the BV (1690 mg/kg) in 1 of 20 tuff samples, at a concentration of 2230 mg/kg. The sample result did not exceed the maximum background concentration of magnesium in tuff (2820 mg/kg). Statistical tests were performed to determine if the site sample results for magnesium are different than background. The statistical test results are presented in Table F-5.4-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for magnesium in tuff is presented in Figure F-5.4-11. Magnesium is not identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in 16 of 20 tuff samples, with a maximum concentration of 32.5 mg/kg. Twelve of the 16 results also exceeded the maximum background concentration of nickel in tuff (7 mg/kg). Statistical tests were performed to determine if the site sample results for nickel are different than background. The statistical test results are presented in Table F-5.4-1. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for nickel in tuff is presented in Figure F-5.4-12. Nickel is identified as a COPC in tuff.

Selenium was detected above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in tuff (0.105 mg/kg) in five of 20 tuff samples, with a maximum concentration of 0.36 mg/kg. Selenium also had DLs (0.58–0.63 mg/kg) above the BV in four tuff samples. Statistical tests were not performed because the background data of selenium in Qbt 2,3,4 tuff are all nondetects. The box plot for selenium in tuff is presented in Figure F-5.4-13. Selenium is identified as a COPC in tuff.

Vanadium was detected above the BV (17.0 mg/kg) in 1 of 14 tuff samples, at a concentration of 21 mg/kg. The sample result is equal to the maximum background concentration of vanadium in tuff (21 mg/kg). Statistical tests were performed to determine if the site sample results for vanadium are different than background. The statistical test results are presented in Table F-5.4-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for vanadium in tuff is presented in Figure F-5.4-14. Vanadium is not identified as a COPC in tuff.

F-5.4.2 Organic Chemicals at AOC 32-003

All 24 samples from AOC 32-003 were analyzed for PCBs, SVOCs, and VOCs. Table 8.6-1 summarizes the samples collected and the requested analyses for each sample.

Table 8.6-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 8.6-3.

F-5.4.2.1 Organic Chemicals in Soil

Four soil samples from AOC 32-003 were analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; methylene chloride; phenanthrene; and pyrene were detected in at least one soil sample, and are identified as COPCs in soil at AOC 32-003.

F-5.4.2.2 Organic Chemicals in Tuff

Twenty tuff samples from AOC 32-003 analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1260, bis(2-ethylhexyl)phthalate, fluoranthene, methylene chloride, and pyrene were detected in at least one tuff sample, and are identified as COPCs in tuff.

F-5.4.3 Radionuclides at AOC 32-003

Radionuclides were not analyzed at AOC 32-003, in accordance with the approved work plan (LANL 2006, 091916; NMED 2006, 095460).

F-5.4.4 Summary of COPCs at AOC 32-003

The inorganic COPCs are antimony, beryllium, chromium, copper, nickel, selenium, sodium, and zinc.

The organic COPCs are Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; methylene chloride; phenanthrene; and pyrene.

F-5.4.5 Nature and Extent of Contamination at AOC 32-003

F-5.4.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at AOC 32-003 are antimony, beryllium, chromium, copper, nickel, selenium, sodium, and zinc. Sample results are presented in Table 8.6-2 and are shown on Figure 8.6-2.

Antimony was not detected above its BV at the site. Therefore, the lateral and vertical extent for antimony are defined.

Beryllium, copper, and zinc were detected above BVs in only one or two samples. All concentrations are less than twice the BVs. Therefore, the lateral and vertical extent of beryllium, copper, and zinc are defined.

Concentrations of chromium and nickel increase with depth at multiple locations. All concentrations are less than 3 times the maximum background concentration (13 mg/kg for chromium and 7 mg/kg for nickel), except for the deeper samples at locations 00-603601 and 00-603606. At the two locations with the deepest samples (00-603600 and 00-603607), concentrations of chromium and nickel decrease with depth or are below the BV in both samples. Concentrations of chromium and nickel decrease downslope. Therefore, the lateral and vertical extent of chromium and nickel are defined.

Selenium was detected above the BV in five samples at concentrations of 0.32–0.36 mg/kg. These concentrations are 20% or less above the BV. Selenium was not detected above the BV in samples from downslope locations. Therefore, the lateral and vertical extent of selenium are defined.

Sodium was detected above the BV in only one sample and the concentration decreased with depth. Sodium was not detected above the BV in any other locations at the site. Therefore, the lateral and vertical extent of sodium are defined.

F-5.4.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at AOC 32-003 are Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; methylene chloride; phenanthrene; and pyrene. Sample results are presented in Table 8.6-3 and are shown in Figure 8.6-3.

Concentrations of these COPCs decrease with depth, except for Aroclor-1260 at location 00-603608, bis(2-ethylhexyl)phthalate at location 00-603604, and methylene chloride at locations 00-603600 and 00-603611. Bis(2-ethylhexyl)phthalate and methylene chloride were detected at or below EQLs at these locations. Therefore, vertical extent is defined. Aroclor-1260 was detected at 26 mg/kg in the surface sample at location 00-603601, which is located on the east boundary of the site. Therefore, the lateral extent of Aroclor-1260 is not defined. The PAHs were mostly detected at locations 00-603601, 00-603602, and 00-603603, which are located in areas that were not previously excavated, along the site boundaries. Therefore, the lateral and vertical extent of PAHs are not defined.

F-5.4.5. Summary of Nature and Extent for AOC 32-003

The lateral and vertical extent of all inorganic COPCs are defined at AOC 32-003.

The lateral extent of Aroclor-1260 and the lateral and vertical extent of PAHs are not defined at AOC 32-003. The lateral and vertical extent of all other organic COPCs are defined.

F-5.5 AOC 32-004

A total of 12 samples (4 tuff and 8 soil) were collected in 1996 and 2008 from 8 locations at AOC 32-004. Table 8.7-1 lists the samples collected and the analyses requested for each sample. Figure 8.7-1 is the site map showing sampling locations.

F-5.5.1 Inorganic Chemicals at AOC 32-004

All 12 samples were analyzed for TAL metals. Three samples were also analyzed for cyanide (total), nitrate, and perchlorate. Table 8.7-1 summarizes samples collected and the requested analyses for each sample.

Table 8.7-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 8.7-2.

F-5.5.1.1 Inorganic Chemicals in Soil

Eight soil samples from AOC 32-004 were analyzed for TAL metals.

Antimony was not detected, but had DLs (5.8–11 mg/kg) above the BV (0.83 mg/kg) and above the maximum background concentration of antimony in soil (1 mg/kg) in all eight soil samples. Antimony is identified as a COPC in soil.

Cadmium was detected above the BV (0.4 mg/kg) in two of eight soil samples, with concentrations of 0.54 and 1.1 mg/kg. Cadmium also had DLs (0.51–0.58 mg/kg) above the BV in the other six soil samples. The sample results and the DLs are below the maximum background concentration of cadmium in soil (2.6 mg/kg). The box plot for cadmium in soil is presented in Figure F-5.5-1. Cadmium is not identified as a COPC in soil.

Chromium was detected above the BV (19.3 mg/kg) in one of eight soil samples, at a concentration of 32 mg/kg. This result was below the maximum background concentration of chromium in soil (36.5 mg/kg). The box plot for chromium in soil is presented in Figure F-5.5-2. Chromium is not identified as a COPC in soil.

Copper was detected above the BV (14.7 mg/kg) in two of eight soil samples, with concentrations of 15 and 26 mg/kg. One of the two results also exceeded the maximum background concentration of copper in soil (16 mg/kg). The box plot for copper in soil is presented in Figure F-5.5-3. Copper is identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) and above the maximum background concentration of lead in soil (28 mg/kg) in four of eight soil samples, with a maximum concentration of 200 mg/kg. The box plot for lead in soil is presented in Figure F-5.5-4. Lead is identified as a COPC in soil.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in soil (also 0.1 mg/kg) in three of eight soil samples, with a maximum concentration of 0.55 mg/kg. Mercury also had DLs (all 0.11 mg/kg) above the BV in three soil samples. The box plot for mercury in soil is presented in Figure F-5.5-5. Mercury is identified as a COPC in soil.

Silver was detected above the BV (1 mg/kg) in one of eight soil samples, at a concentration of 3.3 mg/kg. Silver also had DLs (2–2.2 mg/kg) above the BV in five soil samples. Results were compared only to the BV because a background dataset for silver in soil is not available. Silver is identified as a COPC in soil.

Thallium was not detected, but had DLs (2–2.2 mg/kg) above the BV (0.73 mg/kg) and above the maximum background concentration of thallium in soil (1 mg/kg) in six of eight soil samples. Thallium is identified as a COPC in soil.

Zinc was detected above the BV (48.8 mg/kg) in six of eight soil samples, with a maximum concentration of 150 mg/kg. Four of the six results also exceeded the maximum background concentration of zinc in soil (75.5 mg/kg). The box plot for zinc in soil is presented in Figure F-5.5-6. Zinc is identified as a COPC in soil.

F-5.5.1.2 Inorganic Chemicals in Tuff

Four tuff samples from AOC 32-004 were analyzed for TAL metals. Three tuff samples were also analyzed for cyanide (total), nitrate, and perchlorate.

Antimony was not detected, but had DLs (0.52 and 12 mg/kg) above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in tuff (0.4 mg/kg) in two of four tuff samples. Antimony is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) and above the maximum background concentration of chromium in tuff (13 mg/kg) in three of four tuff samples, with a maximum concentration of 44.6 mg/kg. The box plot for chromium in tuff is presented in Figure F-5.5-7. Chromium is identified as a COPC in tuff.

Total cyanide was not detected, but had a DL (0.55 mg/kg) above the BV (0.5 mg/kg) in one tuff sample. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Mercury was not detected, but had a DL (0.12 mg/kg) above the BV (0.1 mg/kg) in one of four tuff samples. Results were compared only to the BV because a background dataset for mercury in tuff is not available. Mercury is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in three of four tuff samples, with a maximum concentration of 24.1 mg/kg. The box plot for nickel in tuff is presented in Figure F-5.5-8. Nickel is identified as a COPC in tuff.

Nitrate was detected in one tuff sample and has no BV. Nitrate is identified as a COPC in tuff.

Selenium was detected above the BV (0.3 mg/kg) in one of four tuff samples, at a concentration of 0.31 mg/kg. Selenium also had a DL (1.2 mg/kg) above the BV. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). The box plot for selenium in tuff is presented in Figure F-5.5-9. Selenium is identified as a COPC in tuff.

Silver was not detected above the BV (1 mg/kg), but had a DL (2.4 mg/kg) above the BV and above the maximum background concentration of silver in tuff (1.9 mg/kg) in one of four tuff samples. The box plot for silver in tuff is presented in Figure F-5.5-10. Silver is identified as a COPC in tuff.

Thallium was not detected, but had a DL (2.4 mg/kg) above the BV (1.1 mg/kg) and above the maximum background concentration of thallium in tuff (1.7 mg/kg) in one of four tuff samples. Thallium is identified as a COPC in tuff.

F-5.5.2 Organic Chemicals at AOC 32-004

Three samples were analyzed for PCBs, SVOCs, and VOCs. Table 8.7-1 summarizes samples collected and the requested analyses for each sample.

Table 8.7-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 8.7-3.

F-5.5.2.1 Organic Chemicals in Soil

Eight soil samples from AOC 32-004 were analyzed for SVOCs. Two samples were also analyzed for VOCs.

Acenaphthene; acetone; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; chrysene; di-n-octylphthalate; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; naphthalene; phenanthrene; and pyrene were detected in at least one soil sample, and are identified as COPCs in soil.

F-5.5.2.2 Organic Chemicals in Tuff

Four tuff samples from AOC 32-004 were analyzed for SVOCs. Three samples were also analyzed for PCBs and VOCs.

Bis(2-ethylhexyl)phthalate was detected in two tuff samples and is identified as a COPC in tuff.

F-5.5.3 Radionuclides at AOC 32-004

Nine samples were analyzed for americium-241, 5 samples were analyzed for gamma-emitting radionuclides, 11 samples were analyzed for isotopic plutonium, isotopic uranium, and tritium, and 3 samples were analyzed for strontium-90. Table 8.7-1 summarizes samples collected and the requested analyses for each sample.

Table 8.7-4 presents the radionuclides detected above FVs. The sampling locations and detected concentrations are shown in Figure 8.7-4.

F-5.5.3.1 Radionuclides in Soil

Eight soil samples from AOC 32-004 were analyzed for radionuclides. Seven samples were analyzed for isotopic plutonium, isotopic uranium, and tritium. Five samples were analyzed for americium-241. Two samples were analyzed for gamma-emitting radionuclides.

Americium-241 was detected above the FV (0.013 pCi/g) and the maximum background concentration of americium-241 in soil (also 0.013 pCi/g) in one soil sample, at a concentration of 0.091 pCi/g. The box plot of americium-241 in soil is presented in Figure F-5.5-11. Americium-241 is identified as a COPC in soil.

F-5.5.3.2 Radionuclides in Tuff

Four tuff samples from AOC 32-004 were analyzed for radionuclides. Each sample was analyzed for americium-241, isotopic plutonium, isotopic uranium, and tritium. Three samples were analyzed for gamma-emitting radionuclides and strontium-90.

No radionuclides were detected or detected above BVs in tuff. Therefore, no radionuclide COPCs are identified for tuff.

F-5.5.4 Summary of COPCs at AOC 32-004

The inorganic COPCs are antimony, chromium, copper, total cyanide, lead, mercury, nickel, nitrate, selenium, silver, thallium, and zinc.

The organic COPCs are acenaphthene; acetone; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; chrysene; di-n-octylphthalate; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; naphthalene; phenanthrene; and pyrene.

The radionuclide COPC is americium-241.

F-5.5.5 Nature and Extent of Contamination at AOC 32-004

F-5.5.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at AOC 32-004 are antimony, chromium, copper, total cyanide, lead, mercury, nickel, nitrate, selenium, silver, thallium, and zinc. Sample results are presented in Table 8.7-2 and are shown in Figure 8.7-2.

Antimony, cyanide, and thallium were not detected above the BV. Therefore, the lateral and vertical extent of antimony, cyanide, and thallium are defined.

Concentrations of chromium and nickel decrease with depth and decrease downslope. Therefore, the lateral and vertical extent of chromium and nickel are defined.

Copper was detected only in two samples, with concentrations less than twice the BV. Concentrations decrease with depth at all locations where deeper samples were collected. Therefore, the lateral and vertical extent of copper are defined.

Lead, mercury, silver, and zinc were not detected above BVs at location 00-603612, where the deepest sample was collected, and concentrations decrease with depth at all locations where deeper samples were collected. They were not detected above BVs in the most downslope sample collected at location 32-06336. Therefore, the lateral and vertical extent of lead, mercury, silver, and zinc are defined.

Nitrate was detected in only one sample at a concentration of 0.26 mg/kg, and it was not detected in deeper samples at this location. The lateral and vertical extent of nitrate are defined.

Selenium was detected only once (0.31 mg/kg), at slightly above the BV (0.3 mg/kg). Therefore, the lateral and vertical extent of selenium are defined.

F-5.5.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at AOC 32-004 are acenaphthene; acetone; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; chrysene; di-n-octylphthalate; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; naphthalene; phenanthrene; and pyrene. Sample results are presented in Table 8.7-3 and are shown in Figure 8.7-3.

None of the COPCs were detected at location 00-603612, where the deepest sample was collected, except for bis(2-ethylhexyl)phthalate. Concentrations of bis(2-ethylhexyl)phthalate decrease with depth at

this location. The lateral extent of all organic COPCs is defined by the most downslope sample, collected at location 32-06336. Therefore, the lateral and vertical extent of all organic COPCs are defined.

F-5.5.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPC identified at AOC 32-004 is americium-241. Sample results are presented in Table 8.7-4 and are shown in Figure 8.7-4.

Americium-241 was detected only once, at 0.091 pCi/g, and concentrations decrease with depth. It was not detected at location 00-603612, where the deepest sample was collected. Therefore, the lateral and vertical extent of americium-241 are defined.

F-5.5.5.4 Summary of Nature and Extent for AOC 32-004

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined at AOC 32-004.

F-6.0 COPCs FOR THE SITE AT TA-41

F-6.1 SWMU 41-001

A total of 34 samples (31 tuff and 3 sediment) were collected in 1995 and during the 2008–2009 investigation from 16 locations at SWMU 41-001. Table 9.3-1 summarizes the samples collected and the requested analyses for each sample. Figure 9.3-1 is the site map showing sampling locations.

F-6.1.1 Inorganic Chemicals at SWMU 41-001

Twenty-nine samples (26 tuff and 3 sediment) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 9.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 9.3-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 9.3-2.

F-6.1.1.1 Inorganic Chemicals in Tuff

Twenty-six tuff (all Qbt 1g) samples from SWMU 41-001 were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Aluminum was detected above the BV (3560 mg/kg) and above the maximum background concentration of aluminum in Qbt 1g tuff (3400 mg/kg) in 4 of 26 tuff samples, with a maximum concentration of 4370 mg/kg. Statistical tests were performed to determine if the site sample results for aluminum are different than background. The statistical test results are presented in Table F-6.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for aluminum in Qbt 1g tuff is presented in Figure F-6.1-1. Aluminum is identified as a COPC in tuff.

Antimony was not detected, but had DLs (0.53 and 0.75 mg/kg) above the BV (0.5 mg/kg) and above the maximum background concentration of antimony in Qbt 1g tuff (0.2 mg/kg) in 2 of 26 tuff samples. Antimony is identified as a COPC in tuff.

Arsenic was detected above the BV (0.56 mg/kg) in 7 of 26 tuff samples, with a maximum concentration of 1.2 mg/kg. Four of the seven results also exceeded the maximum background concentration of arsenic in Qbt 1g tuff (0.7 mg/kg). Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetects. The box plot for arsenic in Qbt 1g tuff is presented in Figure F-6.1-2. Arsenic is identified as a COPC in tuff.

Barium was detected above the BV (25.7 mg/kg) and above the maximum background concentration of barium in Qbt 1g tuff (23 mg/kg) in 10 of 26 tuff samples, with a maximum concentration of 68.7 mg/kg. Statistical tests were performed to determine if the site sample results for barium are different than background. The statistical test results are presented in Table F-6.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for barium in Qbt 1g tuff is presented in Figure F-6.1-3. Barium is identified as a COPC in tuff.

Calcium was detected above the BV (1900 mg/kg) in 9 of 26 tuff samples, with a maximum concentration of 3370 mg/kg. Five of the nine results also exceeded the maximum background concentration of calcium in Qbt 1g tuff (2300 mg/kg). Statistical tests were performed to determine if the site sample results for calcium are different than background. The statistical test results are presented in Table F-6.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for calcium in Qbt 1g tuff is presented in Figure F-6.1-4. Calcium is identified as a COPC in tuff.

Chromium was detected above the BV (2.6 mg/kg) and above the maximum background concentration of chromium in Qbt 1g tuff (2.3 mg/kg) in 7 of 26 tuff samples, with a maximum concentration of 32 mg/kg. Statistical tests were performed to determine if the site sample results for chromium are different than background. The statistical test results are presented in Table F-6.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for chromium in Qbt 1g tuff is presented in Figure F-6.1-5. Chromium is identified as a COPC in tuff.

Copper was detected above the BV (3.96 mg/kg) and above the maximum background concentration of copper in Qbt 1g tuff (2.6 mg/kg) in 3 of 26 tuff samples, with a maximum concentration of 4.1 mg/kg. Statistical tests were performed to determine if the site sample results for copper are different than background. The statistical test results are presented in Table F-6.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for copper in Qbt 1g tuff is presented in Figure F-6.1-6. Copper is identified as a COPC in tuff.

Total cyanide was not detected, but had DLs (0.53–0.56 mg/kg) above the BV (0.5 mg/kg) in 7 of 26 tuff samples. Results were compared only to the BV because a background dataset for total cyanide in Qbt 1g tuff is not available. Total cyanide is identified as a COPC in tuff.

Iron was detected above the BV (3700 mg/kg) and above the maximum background concentration of iron in Qbt 1g tuff (also 3700 mg/kg) in 3 of 26 tuff samples, with a maximum concentration of 6120 mg/kg. Statistical tests were performed to determine if the site sample results for iron are different than background. The statistical test results are presented in Table F-6.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for iron in Qbt 1g tuff is presented in Figure F-6.1-7. Iron is identified as a COPC in tuff.

Lead was detected above the BV (13.5 mg/kg) in 1 of 26 tuff samples, at a concentration of 13.7 mg/kg. The sample result did not exceeded the maximum background concentration of lead in tuff (20 mg/kg). Statistical tests were performed to determine if the site sample results for lead are different than background. The statistical test results are presented in Table F-6.1-1. The result of the Gehan test

indicates that the site sample results are statistically different than background. The box plot for lead in Qbt 1g tuff is presented in Figure F-6.1-8. Lead is identified as a COPC in tuff.

Magnesium was detected above the BV (739 mg/kg) and above the maximum background concentration of magnesium in Qbt 1g tuff (690 mg/kg) in 1 of 26 tuff samples, at a concentration of 755 mg/kg. The sample result is less than twice the BV. Statistical tests were performed to determine if the site sample results for magnesium are different than background. The statistical test results are presented in Table F-6.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. However, based on EPA's Risk Assessment Guidance for Superfund, section 5.9.4, page 5-23, magnesium may be eliminated as a COPC if detected infrequently above background (1 of 26 samples) and not substantially above background. The box plot for magnesium in Qbt 1g tuff is presented in Figure F-6.1-9. Magnesium is not identified as a COPC in tuff.

Manganese was detected above the BV (189 mg/kg) in 3 of 26 tuff samples, with a maximum concentration of 278 mg/kg. Two of the three results also exceeded the maximum background concentration of manganese in Qbt 1g tuff (210 mg/kg). Statistical tests were performed to determine if the site sample results for manganese are different than background. The statistical test results are presented in Table F-6.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for manganese in Qbt 1g tuff is presented in Figure F-6.1-10. Manganese is identified as a COPC in tuff.

Nickel was detected above the BV (2 mg/kg) in 20 of 26 tuff samples, with a maximum concentration of 15.9 mg/kg. Seven of the 20 results also exceeded the maximum background concentration of nickel in Qbt 1g tuff (2.8 mg/kg). Statistical tests were performed to determine if the site sample results for nickel are different than background. The statistical test results are presented in Table F-6.1-1. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for nickel in Qbt 1g tuff is presented in Figure F-6.1-11. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in tuff samples and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was not detected above the BV (0.3 mg/kg),but had DLs (0.53–0.56 mg/kg) above the BV in 25 of 26 tuff samples. Results were compared only to the BV because a background for selenium in Qbt 1g tuff is not available. Selenium is identified as a COPC in tuff.

Vanadium was detected above the BV (4.59 mg/kg) and above the maximum background concentration of vanadium in Qbt 1g tuff (3.8 mg/kg) in 2 of 26 tuff samples, with concentrations of 7.5 and 7.1 mg/kg. Statistical tests were performed to determine if the site sample results for vanadium are different than background. The statistical test results are presented in Table F-6.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for vanadium in Qbt 1g tuff is presented in Figure F-6.1-12. Vanadium is identified as a COPC in tuff.

Zinc was detected above the BV (40.0 mg/kg) in 1 of 26 tuff samples, at a concentration of 41.8 mg/kg. The sample result did not exceed the maximum background concentration of zinc in Qbt 1g tuff (46 mg/kg). Statistical tests were performed to determine if the site sample results for zinc are different than background. The statistical test results are presented in Table F-6.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for zinc in Qbt 1g tuff is presented in Figure F-6.1-13. Zinc is identified as a COPC in tuff.

F-6.1.1.2 Inorganic Chemicals in Sediment

Three sediment samples from SWMU 41-001 were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Nitrate and perchlorate were detected in one or more sediment samples and have no BVs. Nitrate and perchlorate are identified as COPCs in sediment.

Selenium was not detected, but has DLs (0.55–0.61 mg/kg) above the BV (0.3 mg/kg) and above the maximum background concentration of selenium in sediment (0.1 mg/kg) in all three sediment samples. Selenium is identified as a COPC in sediment.

F-6.1.2 Organic Chemicals at SWMU 41-001

Thirty-four samples collected at SWMU 41-001 were analyzed for SVOCs and VOCs. Twenty-nine samples also were analyzed for PCBs. Table 9.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 9.3-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 9.3-3.

F-6.1.2.1 Organic Chemicals in Tuff

Thirty-one tuff samples were analyzed for SVOCs and VOCs. Twenty-six tuff samples also were analyzed for PCBs.

Acetone; anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzyl alcohol; bis(2-ethylhexyl)phthalate; chrysene; di-n-butylphthalate; fluoranthene; indeno(1,2,3-cd)pyrene; pyrene; and toluene were detected in one or more tuff samples, and are identified as COPCs in tuff.

F-6.1.2.2 Organic Chemicals in Sediment

Three sediment samples were analyzed for PCBs, SVOCs, and VOCs.

Benzo(b)fluoranthene, benzo(k)fluoranthene, benzyl alcohol, chrysene, fluoranthene, and pyrene were detected in one or two sediment samples, and are identified as COPCs in sediment.

F-6.1.3 Radionuclides at SWMU 41-001

Thirty-four samples from SWMU 41-001 were analyzed for tritium, isotopic plutonium, and isotopic uranium. Twenty-nine samples also were analyzed for americium-241, gamma-emitting radionuclides, and strontium-90. Table 9.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 9.3-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 9.3-4.

F-6.1.3.1 Radionuclides in Tuff

Thirty-one tuff samples were analyzed for tritium, isotopic plutonium, and isotopic uranium. Twenty-six tuff samples were also analyzed for americium-241, gamma-emitting radionuclides, and strontium-90.

Plutonium-239/240 was detected in 7 of 31 tuff samples with a maximum concentration of 0.329 pCi/g, and has no tuff FV. Plutonium-239/240 is identified as a COPC in tuff.

Tritium was detected in 7 of 31 tuff samples with a maximum concentration of 1.02 pCi/g, and has no tuff FV. Tritium is identified as a COPC in tuff.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in 2 of 31 tuff samples, with concentrations of 0.294 and 0.187 pCi/g. Results were compared only to the BV because background dataset for uranium-235/236 in tuff is not available. Uranium-235/236 is identified as a COPC in tuff.

F-6.1.3.2 Radionuclides in Sediment

Three sediment samples were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) and above the maximum background concentration of plutonium-239/240 in sediment (0.065 pCi/g) in two of three sediment samples, with concentrations of 0.368 and 0.127 pCi/g. The box plot for plutonium-239/240 in sediment is presented in Figure F-6.1-13. Plutonium-239/240 is identified as a COPC in sediment.

F-6.1.4 Summary of COPCs at SWMU 41-001

The inorganic chemicals identified as COPCs at SWMU 41-001 are aluminum, antimony, arsenic, barium, calcium, chromium, copper, total cyanide, iron, lead, manganese, nickel, nitrate, perchlorate, selenium, vanadium, and zinc.

The organic chemicals identified as COPCs at SWMU 41-001 are acetone, anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzyl alcohol, bis(2-ethylhexyl)phthalate, chrysene, di-n-butylphthalate, fluoranthene, indeno(1,2,3-cd)pyrene, pyrene, and toluene.

The radionuclides identified as COPCs at SWMU 41-001 are plutonium-239/240, tritium, and uranium-235/236.

F-6.1.5 Nature and Extent of Contamination at SWMU 41-001

F-6.1.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at SWMU 41-001 are aluminum, antimony, arsenic, barium, calcium, chromium, copper, total cyanide, iron, lead, manganese, nickel, nitrate, perchlorate, selenium, vanadium, and zinc. Sample results are presented in Table 9.3-2 and are shown in Figure 9.3-2.

Aluminum was detected above the BV at two locations. Concentrations increased slightly with depth at location 00-603725 and decreased with depth at location 00-603736. All concentrations are less than

twice the BV. Aluminum was not detected above the BV in samples from similar depths at other locations. Therefore, the lateral and vertical extent of aluminum are defined.

Antimony, total cyanide, and selenium were not detected at the site. Therefore, the lateral and vertical extent of antimony, total cyanide, and selenium are defined.

Concentrations of arsenic decrease with depth, except at location 00-603736 where concentrations remain the same, and at location 00-603735 where it was detected above BV only in the deeper sample. All concentrations of arsenic are less than or approximately twice the BV. Therefore, the lateral and vertical extent of arsenic are defined.

Concentrations of barium decrease with depth, except at location 00-603734 where concentrations increase slightly with depth, and at location 00-603735 where it was detected above BV only in the deeper sample. The majority of concentrations are slightly above the BV, and concentrations detected at location 00-603736 are less than 3 times the BV. Therefore, the lateral and vertical extent of barium are defined.

Calcium was detected above the BV at seven locations. Concentrations decrease at four locations and increase slightly at three locations. All concentrations are less then twice the BV. Therefore, the lateral and vertical extent of calcium are defined.

Concentrations of chromium increase with depth or remain essentially the same at locations 00-603725, 00-603733, and 00-603736 but decrease with depth at location 00-603726. Most concentrations are slightly above the Qbt 1g BV. At the two most downslope locations, chromium was detected slightly above the BV at 7.5 ft bgs at location 00-603736 and was not detected above the BV at location 00-603737. Therefore, the lateral and vertical extent of chromium are defined.

Copper was detected above the BV at two locations. Concentrations decrease with depth at one location and do not change with depth at the other location. Concentrations are only slightly above the BV. Therefore, the lateral and vertical extent of copper are defined.

Lead and vanadium were detected at only one location 00-603736 at the site. Concentrations decrease with depth. Therefore, the lateral and vertical extent of copper, lead, and vanadium are defined.

Concentrations of iron and manganese decrease with depth and decrease downslope. Therefore, the lateral and vertical extent of iron and manganese are defined.

Concentrations of nickel decrease or remain substantially the same with depth, and all concentrations are only slightly above the BV, except at location 00-603733, where concentrations increase from 2.3 mg/kg to 15.9 mg/kg. However, at the two most downslope locations, nickel was detected only slightly above the BV down to 7.5 ft at location 00-603736 and was not detected above the BV at location 00-603737. Therefore, the lateral and vertical extent of nickel are defined.

Nitrate was detected at concentrations that are likely naturally occurring (less than 5 mg/kg) at most locations except at locations 00-603735 and 00-603740. Concentrations decrease with depth at location 00-603735 and increase with depth at location 00-603740. Concentrations of nitrate decrease in samples from similar depths at nearby and downslope locations from these two locations. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected at three locations with concentrations decreased or remained essentially the same with depth. Perchlorate concentrations at location 00-603736 are near the EDLs. Perchlorate was

not detected in samples from similar depths at other locations. Therefore, the lateral and vertical extent of perchlorate are defined.

Zinc was detected above the BV in only one sample at a concentration less than 5% above the BV. Concentrations also decreased with depth at this location. Zinc was not detected above the BV at any other locations at the site. Therefore, the lateral and vertical extent of zinc are defined.

F-6.1.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 41-001 are acetone, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzyl alcohol, bis(2-ethylhexyl)phthalate, chrysene, di-n-butylphthalate, fluoranthene, indeno(1,2,3-cd)pyrene, pyrene, and toluene. Sample results are presented in Table 9.3-3 and are shown in Figure 9.3-3.

Acetone was detected near the EQL in only one sample. The lateral and vertical extent of acetone are defined.

Bis(2-ethylhexyl)phthalate was detected in only two samples and increases slightly with depth. It was not detected at any other locations, including locations with samples at greater depths. Therefore, the lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Di-n-butylphthalate was detected in four samples. It decreases with depth at one location, and was not detected in deeper samples at other locations. Therefore, the lateral and vertical extent of di-n-butylphthalate are defined.

Benzyl alcohol was detected in only two samples. It decreases with depth at one location, and all concentrations are near the EQL. The lateral and vertical extent of benzyl alcohol are defined.

Toluene was detected at or below the EQL in six samples and decreases with depth at one location. The lateral and vertical extent of toluene are defined.

Most concentrations of PAHs increase with depth at location 00-603725, the most upslope location sampled at the site. Most PAHs were not detected or decrease with depth at the two most downslope locations (00-603736 and 00-603737). Therefore, the lateral and vertical extent of PAHs are defined.

F-6.1.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs identified at SWMU 41-001 are plutonium-239/240, tritium, and uranium-235/236. Sample results are presented in Table 9.3-4 and Figure 9.3-4.

Concentrations of plutonium-239/240 increase with depth or remain essentially the same with depth at three locations. Plutonium-239/240 was not detected in deeper samples at the site and was not detected at downslope location 00-603736. Concentrations also decrease with depth at the other downslope location 00-603737. Therefore, the lateral and vertical extent of plutonium-239/240 are defined.

Concentrations of tritium do not change with depth at location 41-01007 but decrease with depth at all other locations. Tritium was not detected in the two most downslope locations (00-603736 and 00-603737). Therefore, the lateral and vertical extent of tritium are defined.

Concentrations of uranium-235/236 decrease with depth at both locations. Therefore, the lateral and vertical extent of uranium-235/236 are defined.

F-6.1.5.4 Summary of Nature and Extent at SWMU 41-001

The lateral and vertical extent of all inorganic, organic, radionuclide COPCs are defined at SWMU 41-001.

F-7.0 COPCs FOR SITES AT TA-43

F-7.1 AOC 43-001(b2)

Twenty-three samples (12 tuff and 11 sediment) were collected during the 2008–2009 investigation from 11 locations at AOC 43-001(b2). Table 10.3-1 summarizes the samples collected and the requested analyses for each sample. Figure 10.3-1 is the site map showing sampling locations.

F-7.1.1 Inorganic Chemicals at AOC 43-001(b2)

All 23 samples collected at AOC 43-001(b2) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 10.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 10.3-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 10.3-2.

F-7.1.1.1 Inorganic Chemicals in Tuff

Twelve tuff samples from AOC 43-001(b2) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Arsenic was detected above the BV (2.79 mg/kg) in 2 of 12 tuff samples, with concentrations of 2.9 and 2.8 mg/kg. Neither result exceeded the maximum background concentration of arsenic in tuff (5 mg/kg). Statistical tests were performed to determine if the site sample results for arsenic are different than background. The statistical test results are presented in Table F-7.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for arsenic in tuff is presented in Figure F-7.1-1. Arsenic is identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) and above the maximum background concentration of barium in tuff (51.6 mg/kg) in 1 of 12 tuff samples, at a concentration of 81.1 mg/kg. Statistical tests were performed to determine if the site sample results for barium are different than background. The statistical test results are presented in Table F-7.1-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for barium in tuff is presented in Figure F-7.1-2. Barium is not identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in 1 of 12 tuff samples, at a concentration of 1.3 mg/kg. The sample result did not exceed the maximum background concentration of beryllium in tuff (1.8 mg/kg). Statistical tests were performed to determine if the site sample results for beryllium are different than background. The statistical test results are presented in Table F-7.1-1. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for beryllium in tuff is presented in Figure F-7.1-3. Beryllium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 6 of 12 tuff samples, with a maximum concentration of 12.2 mg/kg. None of the sample results exceeded the maximum background concentration of chromium in tuff (13 mg/kg). Statistical tests were performed to determine if the site sample results for chromium are different than background. The statistical test results are presented in Table F-7.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for chromium in tuff is presented in Figure F-7.1-4. Chromium is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 3 of 12 tuff samples, with a maximum concentration of 6.4 mg/kg. One of the three results also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). Statistical tests were performed to determine if the site sample results for copper are different than background. The statistical test results are presented in Table F-7.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for copper in tuff is presented in Figure F-7.1-5. Copper is identified as a COPC in tuff.

Total cyanide was detected above the BV (0.5 mg/kg) in 2 of 12 tuff samples, with concentrations of 0.57 and 0.6 mg/kg. Total cyanide also had DLs (0.53–0.73 mg/kg) above the BV in 6 of 12 tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 4 of 12 tuff samples, with a maximum concentration of 37.6 mg/kg. Three of the four results also exceeded the maximum background concentration of lead in tuff (15.5 mg/kg). Statistical tests were performed to determine if the site sample results for lead are different than background. The statistical test results are presented in Table F-7.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for lead in tuff is presented in Figure F-7.1-6. Lead is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in 1 of 12 tuff samples, at a concentration of 7.2 mg/kg. Statistical tests were performed to determine if the site sample results for nickel are different than background. The statistical test results are presented in Table F-7.1-1. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for nickel in tuff is presented in Figure F-7.1-7. Nickel is identified as a COPC in tuff.

Nitrate was detected in 8 of 12 tuff samples and has no BV. Nitrate is identified as a COPC in tuff.

Selenium was detected above the BV (0.3 mg/kg) in 2 of 12 tuff samples, with concentrations of 0.31 and 0.32 mg/kg. Selenium also had DLs (0.6–0.73 mg/kg) above the BV in four tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). Statistical tests were not performed because the background data of selenium in Qbt 2,3,4 tuff are all nondetects. The box plot for selenium in tuff is presented in Figure F-7.1-8. Selenium is identified as a COPC in tuff.

Zinc was detected above the BV (63.5 mg/kg) in 2 of 12 tuff samples, with concentrations of 74.9 and 65.1 mg/kg. One of the two results also exceeded the maximum background concentration of zinc in tuff (65.6 mg/kg). Statistical tests were performed to determine if the site sample results for zinc are different than background. The statistical test results are presented in Table F-7.1-1. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for zinc in tuff is presented in Figure F-7.1-9. Zinc is identified as a COPC in tuff.

F-7.1.1.2 Inorganic Chemicals in Sediment

Eleven sediment samples from AOC 43-001(b2) were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Beryllium was detected above the BV (1.31 mg/kg) and above the maximum background concentration of beryllium in sediment (1.3 mg/kg) in 1 of 11 sediment samples, at a concentration of 1.5 mg/kg. Statistical tests were performed to determine if the site sample results for beryllium are different than background. The statistical test results are presented in Table F-7.1-2. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for beryllium in sediment is presented in Figure F-7.1-10. Beryllium is not identified as a COPC in sediment.

Cadmium was detected above the BV (0.4 mg/kg) and above the maximum background concentration (0.18 mg/kg) in 1 of 11 sediment samples, at a concentration of 0.47 mg/kg. Statistical tests were performed to determine if the site sample results for cadmium are different than background. The statistical test results are presented in Table F-7.1-2. The result of the quantile test indicates that the site sample results are statistically different than background. The box plot for cadmium in sediment is presented in Figure F-7.1-11. Cadmium is identified as a COPC in sediment.

Chromium was detected above the BV (10.5 mg/kg) and above the maximum background concentration of chromium in sediment (9.2 mg/kg) in 3 of 11 sediment samples, with a maximum concentration of 29.1 mg/kg. Statistical tests were performed to determine if the site sample results for chromium are different than background. The statistical test results are presented in Table F-7.1-2. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for chromium in sediment is presented in Figure F-7.1-12. Chromium is not identified as a COPC in sediment.

Total cyanide was detected above the BV (0.82 mg/kg) and above the maximum background concentration of total cyanide in sediment (0.63 mg/kg) in 5 of 11 sediment samples, with a maximum concentration of 6.9 mg/kg. Statistical tests were performed to determine if the site sample results for total cyanide are different than background. The statistical test results are presented in Table F-7.1-2. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for total cyanide in sediment is presented in Figure F-7.1-13. Total cyanide is identified as a COPC in sediment.

Lead was detected above the BV (19.7 mg/kg) in 8 of 11 sediment samples, with a maximum concentration of 117 mg/kg. Seven of the eight results also exceeded the maximum background concentration of lead in sediment (25.6 mg/kg). Statistical tests were performed to determine if the site sample results for lead are different than background. The statistical test results are presented in Table F-7.1-2. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for lead in sediment is presented in Figure F-7.1-14. Lead is identified as a COPC in sediment.

Nickel was detected above the BV (9.38 mg/kg) and above the maximum background concentration of nickel in sediment (8.9 mg/kg) in 1 of 11 sediment samples, at a concentration of 12 mg/kg. Statistical tests were performed to determine if the site sample results for nickel are different than background. The statistical test results are presented in Table F-7.1-2. The results of both the Gehan test and the quantile test indicate that the site sample results are not statistically different than background. The box plot for nickel in sediment is presented in Figure F-7.1-15. Nickel is not identified as a COPC in sediment.

Nitrate was detected in 8 of 11 sediment samples and has no BV. Nitrate is identified as a COPC in sediment.

Selenium was not detected above the BV (0.3 mg/kg), but had DLs (0.6–0.67 mg/kg) above the BV and above the maximum background concentration of selenium in sediment (0.1 mg/kg) in 4 of 11 sediment samples. Statistical tests were not performed because the background data of selenium in sediment are all nondetects. The box plot for selenium in sediment is presented in Figure F-7.1-16. Selenium is identified as a COPC in sediment.

Zinc was detected above the BV (60.2 mg/kg) and above the maximum background concentration of zinc in sediment (56.2 mg/kg) in 8 of 11 sediment samples, with a maximum concentration of 147 mg/kg. Statistical tests were performed to determine if the site sample results for zinc are different than background. The statistical test results are presented in Table F-7.1-2. The result of the Gehan test indicates that the site sample results are statistically different than background. The box plot for zinc in sediment is presented in Figure F-7.1-17. Zinc is identified as a COPC in sediment.

F-7.1.2 Organic Chemicals at AOC 43-001(b2)

All 23 samples collected at AOC 43-001(b2) were analyzed for dioxins/furans, nitrate, PCBs, SVOCs, and VOCs. Table 10.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 10.3-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 10.3-1.

F-7.1.2.1 Organic Chemicals in Tuff

Twelve tuff samples from AOC 43-001(b2) were analyzed for dioxins/furans, nitrate, PCBs, SVOCs, and VOCs.

Acenaphthene, anthracene, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, carbon disulfide, chrysene, dibenzofuran, fluoranthene, fluorene, 1,2,3,4,6,7,8-heptachlorodibenzodioxin, heptachlorodibenzodioxins (total), 1,2,3,4,6,7,8-heptachlorodibenzofuran, 1,2,3,4,7,8,9-heptachlorodibenzofuran, heptachlorodibenzofurans (total), 1,2,3,4,7,8-hexachlorodibenzodioxin, 1,2,3,6,7,8-hexachlorodibenzodioxin, 1,2,3,7,8,9-hexachlorodibenzodioxin, hexachlorodibenzodioxins (total), 1,2,3,4,7,8-hexachlorodibenzofuran, 1,2,3,6,7,8-hexachlorodibenzofuran, 1,2,3,7,8,9-hexachlorodibenzofuran, 2,3,4,6,7,8-hexachlorodibenzofuran, hexachlorodibenzofurans (total), indeno(1,2,3-cd)pyrene, methylene chloride, 2-methylnaphthalene, naphthalene, 1,2,3,4,6,7,8,9-octachlorodibenzodioxin, 1,2,3,4,6,7,8,9-octachlorodibenzofuran, 1,2,3,7,8-pentachlorodibenzodioxin, pentachlorodibenzodioxins (total), 1,2,3,7,8-pentachlorodibenzofuran, 2,3,4,7,8-pentachlorodibenzofuran, pentachlorodibenzofurans (totals), phenanthrene, pyrene, tetrachlorodibenzodioxins (total), tetrachlorodibenzofurans (totals), and 1,2,4-trimethylbenzene were detected in one or more tuff samples and are identified as COPCs in tuff.

F-7.1.2.2 Organic Chemicals in Sediment

Eleven sediment samples from AOC 43-001(b2) were analyzed for dioxins/furans, nitrate, PCBs, SVOCs, and VOCs.

Acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; chrysene; di-n-octylphthalate; dibenz(a,h)anthracene; dibenzofuran; 1,3-dichlorobenzene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; heptachlorodibenzodioxins (total); 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; heptachlorodibenzofurans (total); 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; hexachlorodibenzodioxins (total); 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; hexachlorodibenzofurans (total); indeno(1,2,3-cd)pyrene; methylene chloride; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; pentachlorodibenzodioxins (total); 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; pentachlorodibenzofurans (totals); phenanthrene; pyrene; styrene; 2,3,7,8-tetrachlorodibenzodioxin; tetrachlorodibenzodioxins (total); 2,3,7,8-tetrachlorodibenzofuran; and tetrachlorodibenzofurans (totals) were detected in one or more sediment samples and are identified as COPCs in sediment.

F-7.1.3 Radionuclides at AOC 43-001(b2)

All 23 samples collected at AOC 43-001(b2) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 10.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 10.3-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 10.3-3.

F-7.1.3.1 Radionuclides in Tuff

Twelve tuff samples from AOC 43-001(b2) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in 1 of 12 tuff samples, at a concentration of 0.216 pCi/g. Results were compared only to the BV because background dataset for uranium-235/236 in tuff is not available. Uranium-235/236 is identified as a COPC in tuff.

F-7.1.3.2 Radionuclides in Sediment

Eleven sediment samples from AOC 43-001(b2) were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) and above the maximum background concentration of plutonium-239/240 in sediment (0.065 pCi/g) in 1 of 11 sediment samples, at a concentration of 0.168 pCi/g. Statistical tests were performed to determine if the site sample results for plutonium-239/240 are different than background. The statistical test results are presented in Table F-7.1-3. The results of both the quantile test and the Slippage test indicate that the site sample results are not statistically different than background. The box plot for plutonium-239/240 in sediment is presented in Figure F-7.1-18. Plutonium-239/240 is not identified as a COPC in sediment.

Uranium-235/236 was detected above the BV (0.20 pCi/g) and above the maximum background concentration of uranium-235/236 in sediment (0.16 pCi/g) in 1 of 11 sediment samples, at a concentration of 0.211 pCi/g. Statistical tests were performed to determine if the site sample results for uranium-235/236 are different than background. The statistical test results are presented in Table F-7.1-3. The results of both the quantile test and Slippage test indicate that the site sample results are not statistically different than background. The box plot for uranium-235/236 in sediment is presented in Figure F-7.1-19. Uranium-235/236 is not identified as a COPC in sediment.

F-7.1.4 Summary of COPCs at AOC 43-001(b2)

The inorganic chemicals identified as COPCs at AOC 43-001(b2) are arsenic, cadmium, chromium, copper, total cyanide, lead, nickel, nitrate, selenium, and zinc.

The organic chemicals identified as COPCs at AOC 43-001(b2) are acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; carbon disulfide; butylbenzylphthalate; chrysene; di-n-octylphthalate; dibenz(a,h)anthracene; dibenzofuran; 1,3-dichlorobenzene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; styrene; 1,2,4-trimethylbenzene; and dioxins and furans (1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans).

The radionuclide identified as a COPC at AOC 43-001(b2) is uranium-235/236.

F-7.1.5 Nature and Extent of Contamination at AOC 43-001(b2)

F-7.1.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at AOC 43-001(b2) are arsenic, cadmium, chromium, copper, total cyanide, lead, nickel, nitrate, selenium, and zinc. Sample results are presented in Table 10.3-2 and Figure 10.3-2.

Arsenic was detected above the BV at locations 00-604266 and 00-604267. Concentrations increase with depth at these two locations, however, the concentrations in the deepest samples are less than 5% above the BV. Arsenic was not detected above the BV in any other downslope locations. Therefore, the lateral and vertical extent of arsenic are defined.

Cadmium was detected only in one sample at the site (at location 00-604272) with a concentration less than 5% above the BV. Concentrations also decreased with depth at this location. Cadmium was not detected above the BV at the downslope location 00-604273. Therefore, the lateral and vertical extent of cadmium are defined.

Chromium concentrations in tuff and sediment are slightly above the BV and below the maximum background concentration, except for one sediment sample at location 00-604272 in which the concentration is 29.7 mg/kg. Concentrations at this location decrease with depth, and concentrations decrease downslope. Therefore, the lateral and vertical extent of chromium are defined.

Copper was detected in four samples with concentrations slightly above BVs. Copper was not detected above the BV at the most downslope location 00-604273. Therefore, the lateral and vertical extent of copper are defined.

All concentrations of cyanide (total) and lead decrease with depth and decrease downslope at most locations. They were not detected above BVs at the farthest downslope location (00-604273). Therefore, the lateral and vertical extent of cyanide (total) and lead are defined.

Nickel and selenium were detected in only two samples, with concentrations only slightly above BVs. They were not detected above BVs at the farthest downslope location (00-604273). Therefore, the lateral and vertical extent of nickel and selenium are defined.

Nitrate was detected in multiple samples at concentrations of 0.12–1.8 mg/kg. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent of nitrate are defined.

Concentrations of zinc decrease with depth and decrease downslope. Therefore, the lateral and vertical extent of zinc are defined.

F-7.1.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at AOC 43-001(b2) are acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; carbon disulfide; butylbenzylphthalate; chrysene; di-n-octylphthalate; dibenz(a,h)anthracene; dibenzofuran; 1,3-dichlorobenzene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; styrene; 1,2,4-trimethylbenzene; and dioxins and furans (1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans). Sample results are presented in 10.3-3 and are shown on Plate 10.3-1.

The majority of detections, including all the dioxins and furans, are at low levels near or at the EQLs, and concentrations decrease with depth except at location 00-604269, where concentrations remain essentially the same. Concentrations of PAHs at the site were detected at the farthest upslope location (00-604276), and concentrations generally decrease downslope. Concentrations at the farthest downslope location (00-604273) are at relatively low levels or were not detected. Therefore, the lateral and vertical extent of all organic COPCs are defined.

F-7.1.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPC identified at AOC 43-001(b2) is uranium-235/236. Sample results are presented in Table 10.3-4 and Figure 10.3-3.

Uranium-235/236 was detected in two samples, with concentrations slightly above the BV in one sample and approximately twice the BV in the other sample. Concentrations of uranium-235/236 decrease downslope. Therefore, the lateral and vertical extent of uranium-235/236 are defined.

F-7.1.5.4 Summary of Nature and Extent at AOC 43-001(b2)

The lateral and vertical extent of all inorganic, organic, radionuclide COPCs are defined at AOC 43-001(b2).

F-7.2 AOC C-43-001

A total of 15 samples (7 tuff and 8 sediment) were collected during the 2008–2009 investigation from seven locations at AOC C-43-001. Table 10.4-1 summarizes the samples collected and the requested analyses for each sample. Figure 10.4-1 is the site map showing sampling locations.

F-7.2.1 Inorganic Chemicals at AOC C-43-001

All 15 samples collected at AOC C-43-001 were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total). Table 10.4-1 summarizes the samples collected and the requested analyses for each sample.

Table 10.4-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 10.4-2.

F-7.2.1.1 Inorganic Chemicals in Tuff

Seven tuff samples from AOC C-43-001 were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Arsenic was detected above the BV (2.79 mg/kg) in one of seven tuff samples, at a concentration of 3.1 mg/kg. The sample result did not exceeded the maximum background concentration of arsenic in tuff (5 mg/kg). The box plot for arsenic in tuff is presented in Figure F-7.2-1. Arsenic is not identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) in one of seven tuff samples, at a concentration of 46.1 mg/kg. The sample result did not exceeded the maximum background concentration of barium in tuff (51.6 mg/kg). The box plot for barium in tuff is presented in Figure F-7.2-2. Barium is not identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum background concentration of calcium in tuff (2230 mg/kg) in one of seven tuff samples, at a concentration of 3430 mg/kg. The sample concentration is less than twice the BV. Based on EPA's Risk Assessment Guidance for Superfund, section 5.9.4, page 5-23, calcium may be eliminated as a COPC if detected infrequently above background (one of seven samples) and not substantially above background. The box plot for calcium in tuff is presented in Figure F-7.2-3. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in four of seven tuff samples, with a maximum concentration of 22 mg/kg. Two of the four results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). The box plot for chromium in tuff is presented in Figure F-7.2-4. Chromium is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in four of seven tuff samples, with a maximum concentration of 9.3 mg/kg. One of the four results also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). The box plot for copper in tuff is presented in Figure F-7.2-5. Copper is identified as a COPC in tuff.

Total cyanide was not detected, but had DLs (0.62 and 0.54 mg/kg) above the BV (0.5 mg/kg) in two of seven tuff samples. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. Total cyanide is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in four of seven tuff samples, with a maximum concentration of 22.5 mg/kg. Two of the four results also exceeded the maximum background concentration of lead in tuff (15.5 mg/kg). The box plot for lead in tuff is presented in Figure F-7.2-6. Lead is identified as a COPC in tuff.

Mercury was detected above the BV (0.1 mg/kg) in two of seven tuff samples, with concentrations of 0.117 and 0.134 mg/kg. Results were compared only to the BV because a background dataset for mercury in tuff is not available. Mercury is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in two of seven tuff samples, with concentrations of 11.3 and 10.1 mg/kg. The box plot for nickel in tuff is presented in Figure F-7.2-7. Nickel is identified as a COPC in tuff.

Nitrate was detected in five of seven tuff samples and has no BV. Nitrate is identified as a COPC in tuff.

Selenium was detected above the BV (0.3 mg/kg) in two of seven tuff samples, both concentrations being 0.32 mg/kg. Selenium also had DLs (0.63 and 0.59 mg/kg) above the BV in two tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). The box plot for selenium in tuff is presented in Figure F-7.2-8. Selenium is identified as a COPC in tuff.

F-7.2.1.2 Inorganic chemicals in Sediment

Eight sediment samples from AOC C-43-001 were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Arsenic was detected above the BV (3.98 mg/kg) and above the maximum background concentration of arsenic in sediment (3.6 mg/kg) in one of eight sediment samples, at a concentration of 4.5 mg/kg. The sample result is less than 20% above the BV. The box plot for arsenic in sediment is presented in Figure F-7.2-9. Because arsenic is detected slightly and infrequently above background (one of eight samples), it is not identified as a COPC in sediment.

Cadmium was detected above the BV (0.4 mg/kg) and above the maximum background concentration of cadmium in sediment (0.18 mg/kg) in two of eight sediment samples, with concentrations of 0.46 and 0.41 mg/kg. The box plot for cadmium in sediment is presented in Figure F-7.2-10. Cadmium is identified as a COPC in sediment.

Calcium was detected above the BV (4420 mg/kg) and above the maximum background concentration of calcium in sediment (4240 mg/kg) in one of eight sediment samples, at a concentration of 4670 mg/kg. The sample concentration is less than twice the BV. Based on EPA's Risk Assessment Guidance for Superfund, section 5.9.4, page 5-23, calcium may be eliminated as a COPC if detected infrequently above background (one of eight samples) and not substantially above background. The box plot for calcium in sediment is presented in Figure F-7.2-11. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (10.5 mg/kg) and above the maximum background concentration of chromium in sediment (9.2 mg/kg) in three of eight sediment samples, with a maximum concentration of 43.5 mg/kg. The box plot for chromium in sediment is presented in Figure F-7.2-12. Chromium is identified as a COPC in sediment.

Cobalt was detected above the BV (4.73 mg/kg) and above the maximum background concentration of cobalt in sediment (4.2 mg/kg) in one of eight sediment samples, at a concentration of 4.9 mg/kg. The sample result is less than 20% above the BV. The box plot for cobalt in sediment is presented in Figure F-7.2-13. Because cobalt is detected slightly and infrequently above background (one of eight samples), it is not identified as a COPC in sediment.

Copper was detected above the BV (11.2 mg/kg) and above the maximum background concentration of copper in sediment (12 mg/kg) in three of eight sediment samples, with a maximum sample concentration of 52 mg/kg. The box plot for copper in sediment is presented in Figure F-7.2-14. Copper is identified as a COPC in sediment.

Total cyanide was detected above the BV (0.82 mg/kg) and above the maximum background concentration of total cyanide in sediment (0.63 mg/kg) in one of eight sediment samples, at a concentration of 1.3 mg/kg. The box plot for total cyanide in sediment is presented in Figure F-7.2-15. Total cyanide is identified as a COPC in sediment.

Lead was detected above the BV (19.7 mg/kg) in six of eight sediment samples, with a maximum concentration of 202 mg/kg. Five of the six results also exceeded the maximum background concentration of lead in sediment (25.6 mg/kg). The box plot for lead in sediment is presented in Figure F-7.2-16. Lead is identified as a COPC in sediment.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in sediment (0.03 mg/kg) in five of eight sediment samples, with a maximum concentration of 0.308 mg/kg. The box plot for mercury in sediment is presented in Figure F-7.2-17. Mercury is identified as a COPC in sediment.

Nitrate was detected in seven of eight sediment samples and has no BV. Nitrate is identified as a COPC in sediment.

Selenium was detected above the BV (0.3 mg/kg) in one of eight sediment samples, at a concentration of 0.41 mg/kg. Selenium also had DLs (0.53–0.61 mg/kg) above the BV in six sediment samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in sediment (0.1 mg/kg). The box plot for selenium in sediment is presented in Figure F-7.2-18. Selenium is identified as a COPC in sediment.

Silver was detected above the BV (1 mg/kg) in one of eight sediment samples, with a concentration of 1.1 mg/kg. The sample result is only 10% above the BV. The box plot for silver in sediment is presented in Figure F-7.2-19. Because silver is detected slightly and infrequently above background (one of eight samples), it is not identified as a COPC in sediment.

Vanadium was detected above the BV (19.7 mg/kg) and above the maximum background concentration of vanadium in sediment (20 mg/kg) in one of eight sediment samples, at a concentration of 20.4 mg/kg. The sample result is less than 20% above the BV. The box plot for vanadium in sediment is presented in Figure F-7.2-20. Because vanadium is detected slightly and infrequently above background (one of eight samples), it is not identified as a COPC in sediment.

Zinc was detected above the BV (60.2 mg/kg) and above the maximum background concentration of zinc in sediment (56.2 mg/kg) in five of eight sediment samples, with a maximum concentration of 144 mg/kg. The box plot for zinc in sediment is presented in Figure F-7.2-21. Zinc is identified as a COPC in sediment.

F-7.2.2 Organic Chemicals at AOC C-43-001

All 15 samples collected at AOC C-43-001 were analyzed for dioxins/furans, PCBs, SVOCs, and VOCs. Table 10.4-1 summarizes the samples collected and the requested analyses for each sample.

Table 10.4-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 10.4-1.

F-7.2.2.1 Organic chemicals in Tuff

Seven tuff samples from AOC C-43-001 were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Acenaphthene; acenaphthylene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; bromomethane; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; heptachlorodibenzodioxins (total); 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; heptachlorodibenzofurans (total); 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; hexachlorodibenzodioxins (total); 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; hexachlorodibenzofurans (total); indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; pentachlorodibenzodioxins (total); 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; pentachlorodibenzofurans (totals); phenanthrene; pyrene; tetrachlorodibenzodioxins (total); and tetrachlorodibenzofurans (totals) were detected in one or more tuff samples and are identified as COPCs in tuff.

F-7.2.2.2 Organic chemicals in Sediment

Eight sediment samples from AOC C-43-001 were analyzed for nitrate, TAL metals, perchlorate, and cyanide (total).

Acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; bromomethane; butylbenzylphthalate; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; heptachlorodibenzodioxins (total); 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; heptachlorodibenzofurans (total); 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin;

1,2,3,7,8,9-hexachlorodibenzodioxin; hexachlorodibenzodioxins (total); 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; hexachlorodibenzofurans (total); indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; pentachlorodibenzodioxins (total); 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; pentachlorodibenzofurans (totals); phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; tetrachlorodibenzodioxins (total); 2,3,7,8-tetrachlorodibenzofuran; tetrachlorodibenzofurans (totals); and toluene were detected in one or more sediment samples and are identified as COPCs in sediment.

F-7.2.3 Radionuclides at AOC C-43-001

All 15 samples collected at AOC C-43-001 were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Table 10.4-1 summarizes the samples collected and the requested analyses for each sample.

Table 10.4-4 presents the radionuclides detected above BVs/FVs, detected radionuclides that have no BVs/FVs, and detected radionuclides for which FVs do not apply. The sampling locations and detected concentrations are shown in Figure 10.4-3.

F-7.2.3.1 Radionuclides in Tuff

Seven tuff samples from AOC C-43-001 were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Tritium was detected in one of seven tuff samples at a concentration of 1.71 pCi/g, and has no tuff FV. Tritium is identified as a COPC in tuff.

F-7.2.3.2 Radionuclides in Sediment

Eight sediment samples from AOC C-43-001 were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

No radionuclides were detected or detected above BVs/FVs in the sediment samples. Therefore, no radionuclides are identified as COPCs in sediment.

F-7.2.4 Summary of COPCs at AOC C-43-001

The inorganic chemicals identified as COPCs at AOC C-43-001 are cadmium, chromium, copper, total cyanide, lead, mercury, nickel, nitrate, selenium, and zinc.

The organic chemicals identified as COPCs at AOC C-43-001 are acenaphthene; acenaphthylene, acetone, anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; bromomethane; butylbenzylphthalate; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; toluene; and dioxins and furans (1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran;

1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans;
1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin;
1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins;
1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran;
1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans;
1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran;
1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran;
2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans).

The only radionuclide identified as a COPC at AOC C-43-001 is tritium.

F-7.2.5 Nature and Extent of Contamination at AOC C-43-001

F-7.2.5.1 Nature and Extent of Inorganic COPCs

The inorganic COPCs identified at AOC C-43-001 are cadmium, chromium, copper, total cyanide, lead, mercury, nickel, nitrate, selenium, and zinc. Sample results are presented in Table 10.4-2 and are shown in Figure 10.4-2.

Cadmium, cyanide, and nickel were detected above BVs in one or two samples. Concentrations of these COPCs are only slightly above BVs and decrease with depth at most locations. Therefore, the lateral and vertical extent of cadmium, cyanide, and nickel are defined.

All chromium concentrations in tuff are less than twice the maximum tuff background concentration (13 mg/kg). Chromium was not detected above BV in surface sediment samples, except at two downslope locations 00-604846 and 00-604847. Concentrations decrease with depth at these two locations. Chromium was not detected above BVs at the third downslope location 00-604848. The vertical extent of chromium is defined, but the lateral extent of chromium is not defined.

Concentrations of copper decrease with depth at most locations. Concentrations are slightly above the BV at two downslope locations 00-604846 and 00-604847 and are below BVs at the third downslope location 00-604848. Therefore, the vertical extent of copper is defined. The lateral extent of copper is not defined because concentrations do not show a clear decreasing trend downslope.

Concentrations of lead decrease with depth at all locations. Lead was detected at 90.7 mg/kg and 202 mg/kg in surface sediment samples at the two downslope locations 00-604846 and 00-604847; these concentrations are higher than those in surface samples upslope. Therefore, the lateral extent of lead is not defined.

Concentrations of mercury decrease with depth except at 00-604277. However, the concentration in the deeper sample at this location are only slightly above the BV. All concentrations are less than 3 times the BV. Therefore, the lateral and vertical extent of mercury are defined.

Nitrate was detected in multiple samples at concentrations of 0.1–1.6 mg/kg. Nitrate at these concentrations are likely naturally occurring. Therefore, the lateral and vertical extent of nitrate are defined.

Selenium was detected above the BV in only three samples. All concentrations are only slightly above BV. Concentrations of selenium decrease downslope. Therefore, the lateral and vertical extent of selenium are defined.

Concentrations of zinc decrease with depth at all locations. Therefore, the vertical extent of zinc is defined. The lateral extent of zinc is not defined because concentrations do not show a clear decreasing trend downslope.

F-7.2.5.2 Nature and Extent of Organic COPCs

The organic COPCs identified at AOC C-43-001 are acenaphthene; acenapthylene, acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; bromomethane; butylbenzylphthalate; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; toluene; and dioxins and furans (1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans). Sample results are presented in Table 10.4-3 and are shown on Plate 10.4-1.

The majority of detections for COPCs including all the dioxins and furans, other than of PAHs, are at or below the EQLs. Aroclor-1254 and Aroclor-1260 decrease with depth at all but one location, and most concentrations are near EQLs. The lateral and vertical extent of dioxins and furans, and Aroclor-1254 and Aroclor-1260 are defined.

VOCs (acetone, bromomethane, 4-isopropyltoluene, and toluene) were detected infrequently (one to three samples), and their concentrations are near or below EQLs. The lateral and vertical extent of VOCs are defined.

Most PAHs were at concentrations between 1 and 3 mg/kg in surface sediment samples, and concentrations decrease with depth except at location 00-604279. Lower concentrations were detected at the three downslope locations (00-604846, 00-604847, and 00-604248), where vertical extent is defined and few COPCs were detected in the deeper depth sample at location 00-604248. Therefore, the lateral and vertical extent of PAHs are defined.

F-7.2.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPC identified at AOC C-43-001 is tritium. Sample results are presented in Table 10.4-4 and Figure 10.4-3.

Tritium was detected in only one sample at 1.71 pCi/g and was not detected in downslope samples. Therefore, the lateral and vertical extent of tritium are defined.

F-7.2.5.4 Summary of Nature and Extent for AOC C-43-001

The lateral and vertical extent for all inorganic, organic, radionuclide COPCs are defined at AOC C-43-001, except for the lateral extent of chromium, copper, lead, and zinc.

F-8.0 COPCs FOR THE SITE AT TA-61

F-8.1 SWMU 61-007

A total of 22 samples (18 fill and 4 tuff) were collected during the 2008–2009 investigation from six locations at SWMU 61-007. The samples were analyzed for organic chemicals only. Table 11.3-1 summarizes the samples collected and the requested analyses for each sample. Figure 11.3-1 is the site map showing sampling locations.

F-8.1.1 Organic Chemicals at SWMU 61-007

All 22 samples collected at SWMU 61-007 were analyzed for PCBs, SVOCs, and VOCs. Table 11.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 11.3-2 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 11.3-2.

F-8.1.1.1 Organic Chemicals in Soil

Eighteen fill samples from SWMU 61-007 were analyzed for PCBs, SVOCs, and VOCs.

Acenaphthene; acetone; anthracene; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzyl alcohol; bis(2-ethylhexyl)phthalate; 2-butanone; chrysene; dibenzofuran; 1,2-dichlorobenzene; fluoranthene; fluorene; hexachlorobenzene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; tetrachloroethene; and toluene were detected in one or more fill samples, and are identified as COPCs in soil.

F-8.1.1.2 Organic Chemicals in Tuff

Four tuff samples from SWMU 61-007 were analyzed for PCBs, SVOCs, and VOCs.

Aroclor-1260, benzyl alcohol, and 1,2,4-trichlorobenzene were detected in one or more tuff samples, and are identified as COPCs in tuff.

F-8.1.2 Summary of COPCs at SWMU 61-007

The organic chemicals identified as COPCs at SWMU 61-007 are acenaphthene; acetone; anthracene; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzyl alcohol; bis(2-ethylhexyl)phthalate; 2-butanone; chrysene; dibenzofuran; 1,2-dichlorobenzene; fluoranthene; fluorene; hexachlorobenzene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; tetrachloroethene; toluene; and 1,2,4-trichlorobenzene.

F-8.1.3 Nature and Extent of Contamination at SWMU 61-007

F-8.1.3.1 Nature and Extent of Organic COPCs

The organic COPCs identified at SWMU 61-007 are acenaphthene; acetone; anthracene; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene;

benzyl alcohol; bis(2-ethylhexyl)phthalate; 2-butanone; chrysene; dibenzofuran; 1,2-dichlorobenzene; fluoranthene; fluorene; hexachlorobenzene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; tetrachloroethene; toluene; and 1,2,4-trichlorobenzene. Sample results are presented in Table 11.3-2 and Figure 11.3-2.

Acetone, 2-butanone, dibenzofuran, 1,2-dichlorobenzene, tetrachloroethene, toluene, and 1,2,4-trichlorobenzene were detected infrequently (1–4 samples) and near or below EQLs. The lateral and vertical extent of these COPCs are defined.

Aroclor-1260 was detected in 21 samples. Concentrations decrease with depth at all locations, but are above the soil screening level (1.12 mg/kg) in the deepest samples at three locations (00-604287, 00-604289, and 00-604291). Concentrations decrease downslope (to the east-southeast) and to the north and south of the center of the site, but are still elevated. Therefore, the lateral and vertical extent of Aroclor-1260 are not defined.

Concentrations of most other organic COPCs decrease with depth at all locations. The majority of the concentrations are at or below EQLs. Concentrations decrease downslope (to the east-southeast), except for benzyl alcohol and bis(2-ethylhexyl)phthalate, which do not change substantially downslope but are below EQLs. The lateral and vertical extent of PAHs is defined.

F-8.1.3.2 Summary of Nature and Extent for SWMU 61-007

The lateral and vertical extent of all organic COPCs are defined at SWMU 61-007, except for Aroclor-1260. The vertical extent of Aroclor-1260 is not defined. Furthermore, although there is a decreasing trend of Aroclor-1260 laterally, its concentrations are still elevated and, therefore, the lateral extent is not adequately defined.

F-9.0 REFERENCES

The following list includes all documents cited in this appendix. 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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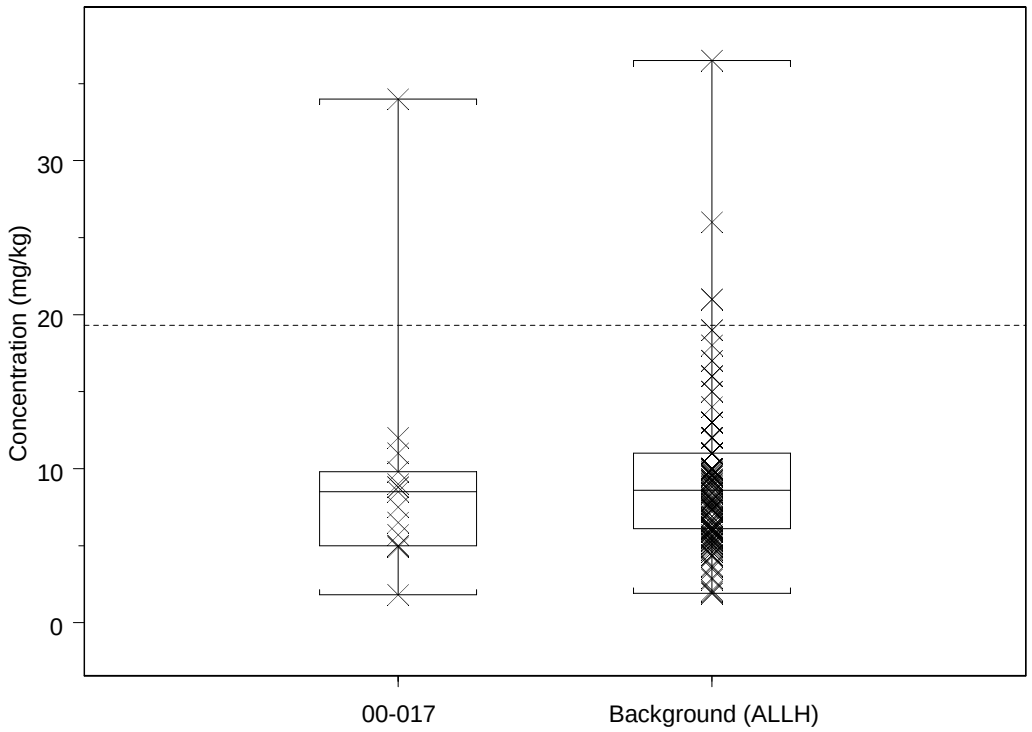


Figure F-2.1-1 Site concentrations of chromium in soil at SWMU 00-017 compared to background

(× = detect, ○ = nondetect)

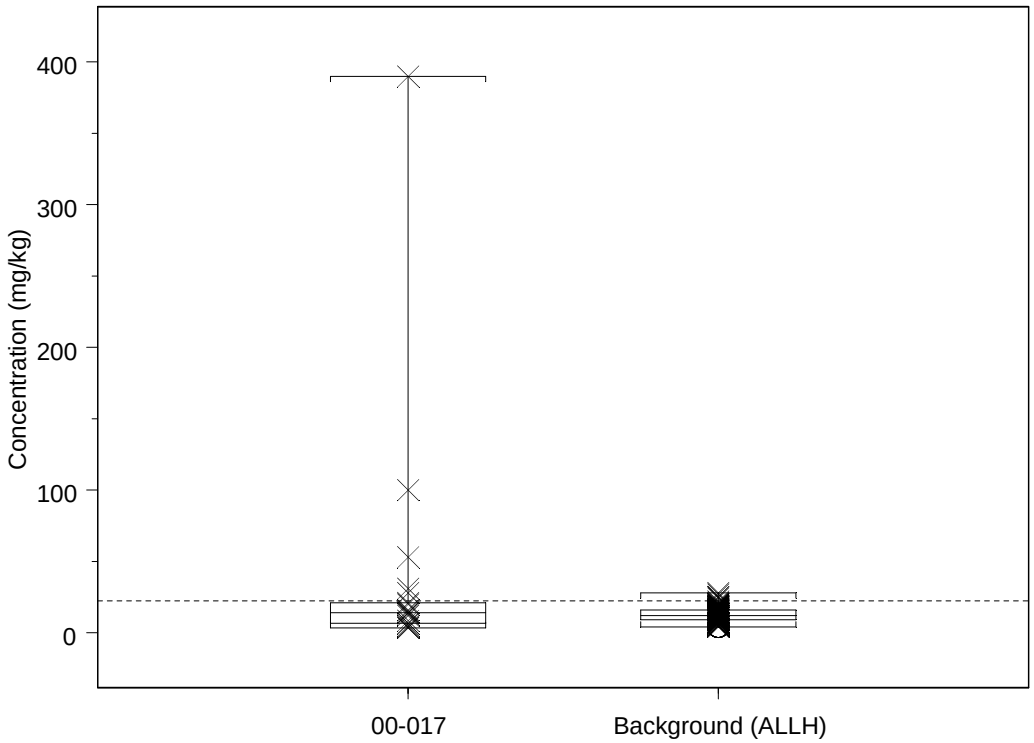


Figure F-2.1-2 Site concentrations of lead in soil at SWMU 00-017 compared to background

(× = detect, ○ = nondetect)

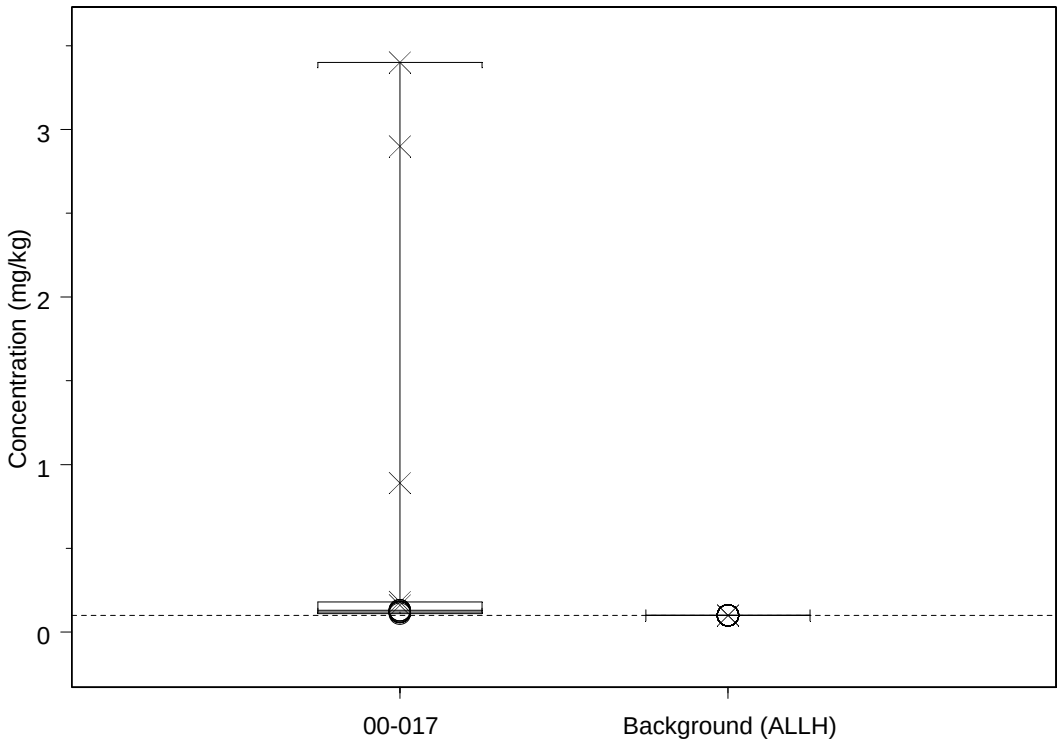


Figure F-2.1-3 Site concentrations of mercury in soil at SWMU 00-017 compared to background
(× = detect, ○ = nondetect)

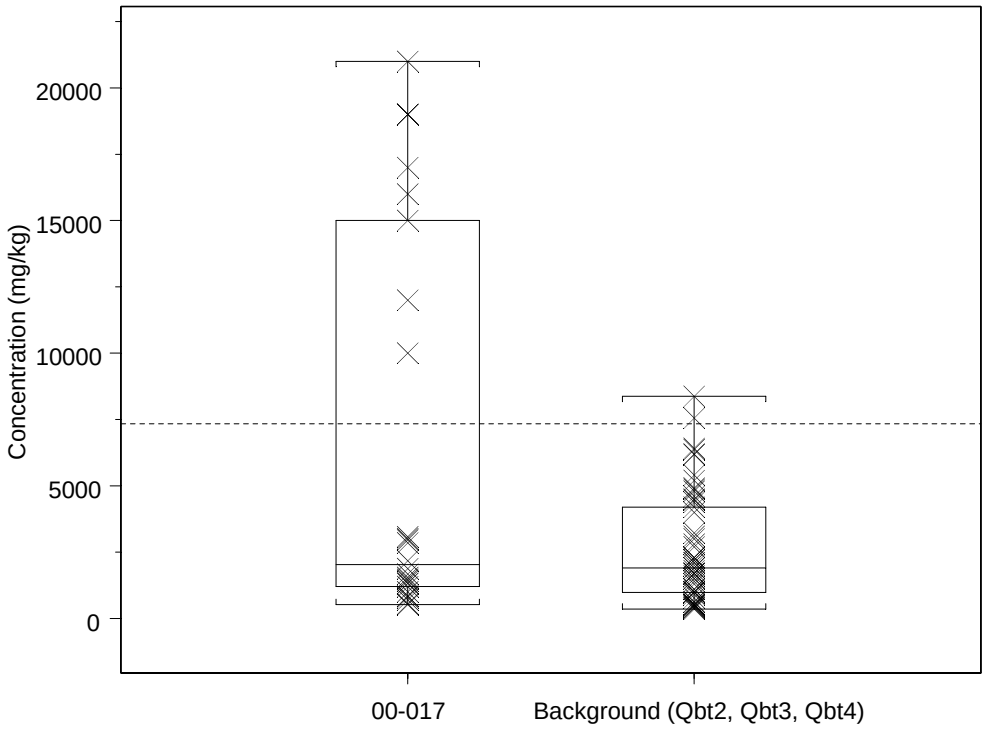


Figure F-2.1-4 Site concentrations of aluminum in tuff at SWMU 00-017 compared to background
(× = detect, ○ = nondetect)

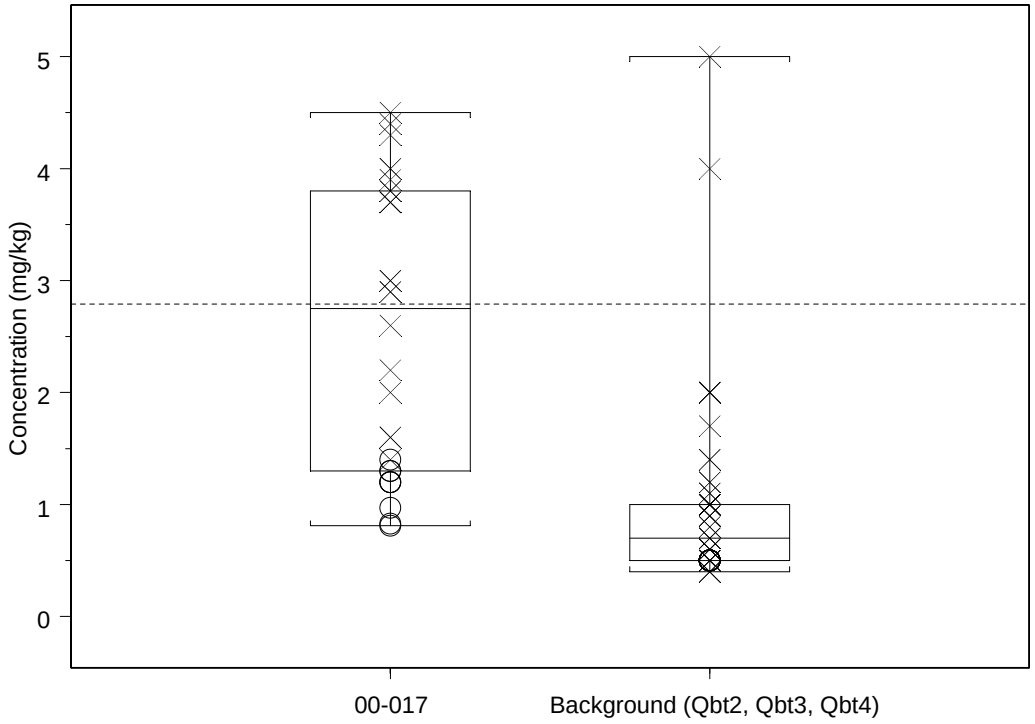


Figure F-2.1-5 Site concentrations of arsenic in tuff at SWMU 00-017 compared to background
(× = detect, ○ = nondetect)

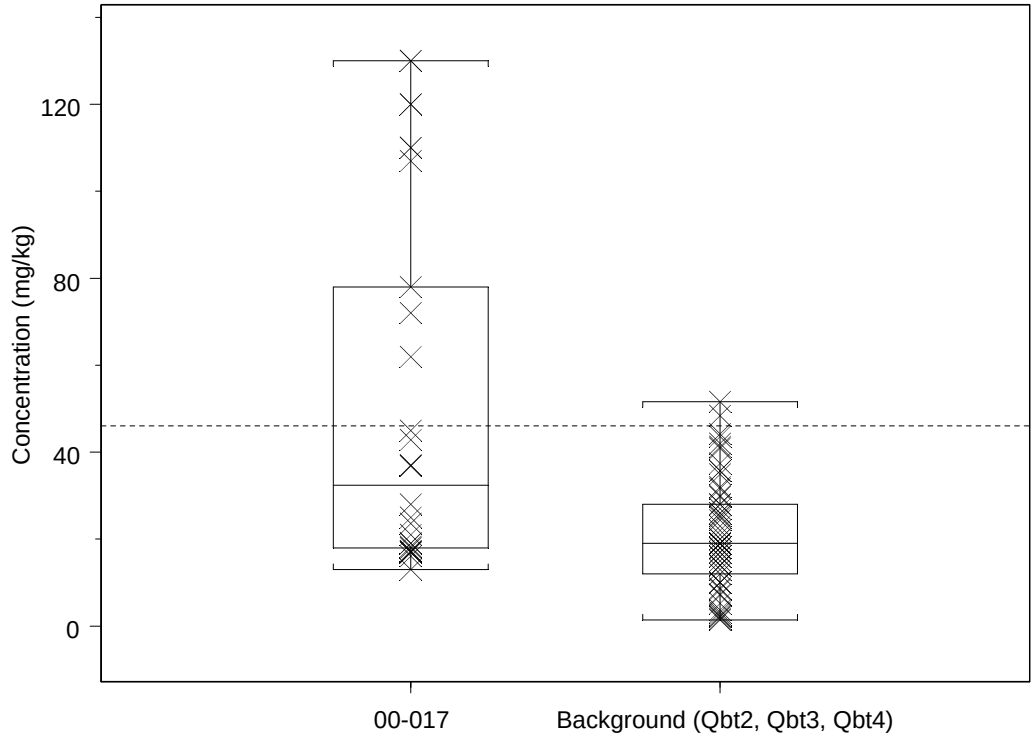


Figure F-2.1-6 Site concentrations of barium in tuff at SWMU 00-017 compared to background
(× = detect, ○ = nondetect)

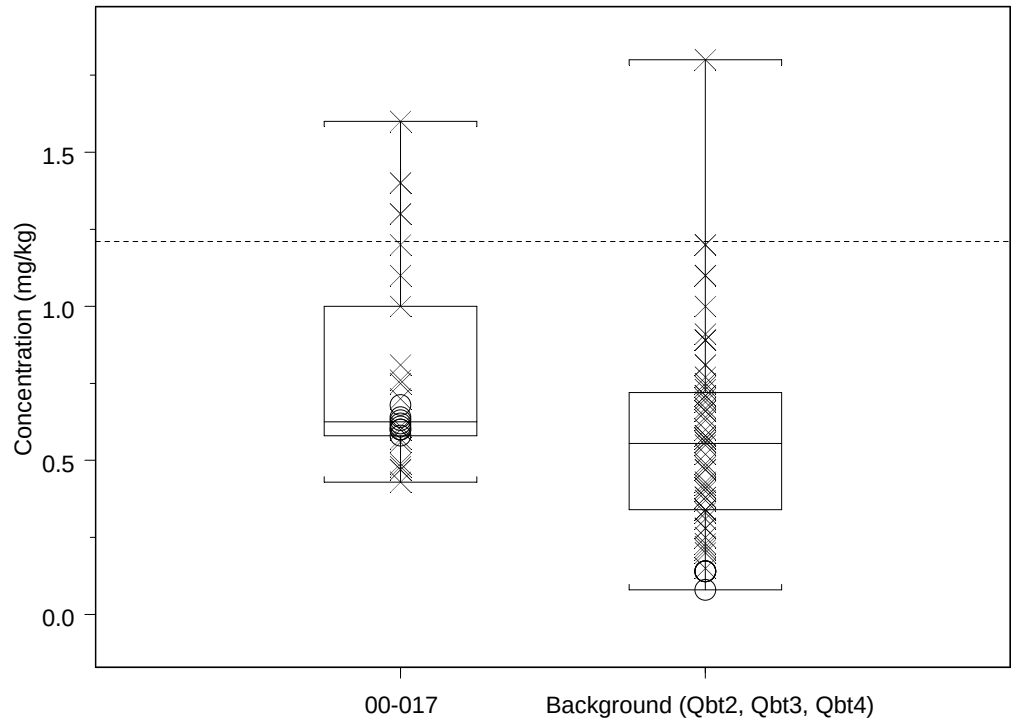


Figure F-2.1-7 Site concentrations of beryllium in tuff at SWMU 00-017 compared to background
(× = detect, ○ = nondetect)

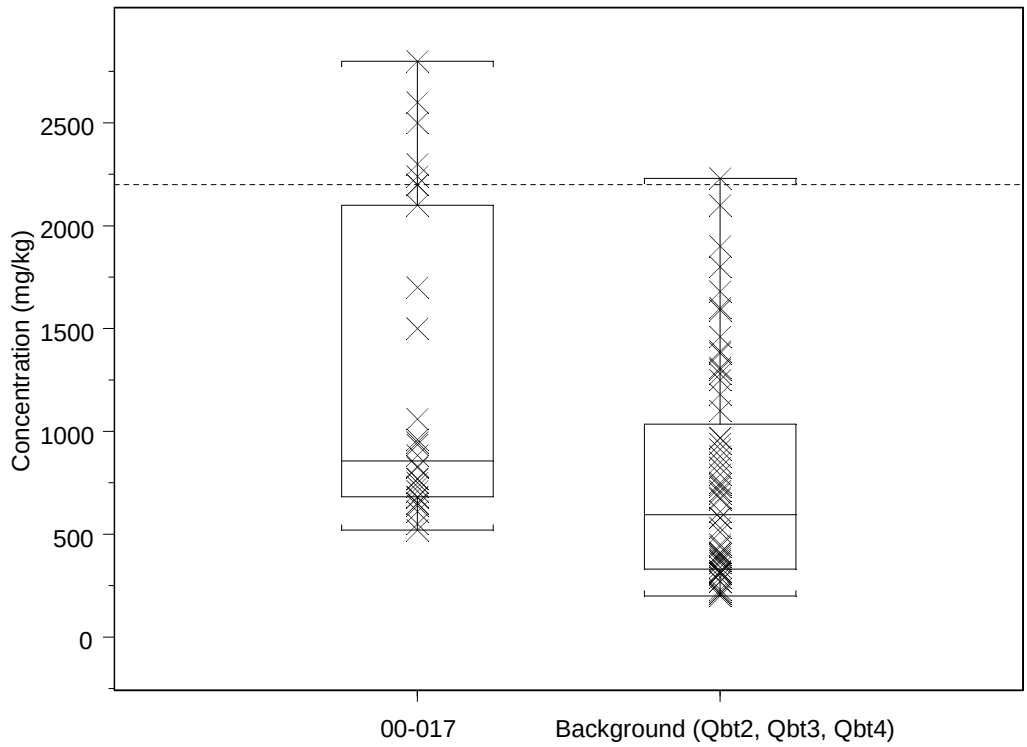


Figure F-2.1-8 Site concentrations of calcium in tuff at SWMU 00-017 compared to background
(× = detect, ○ = nondetect)

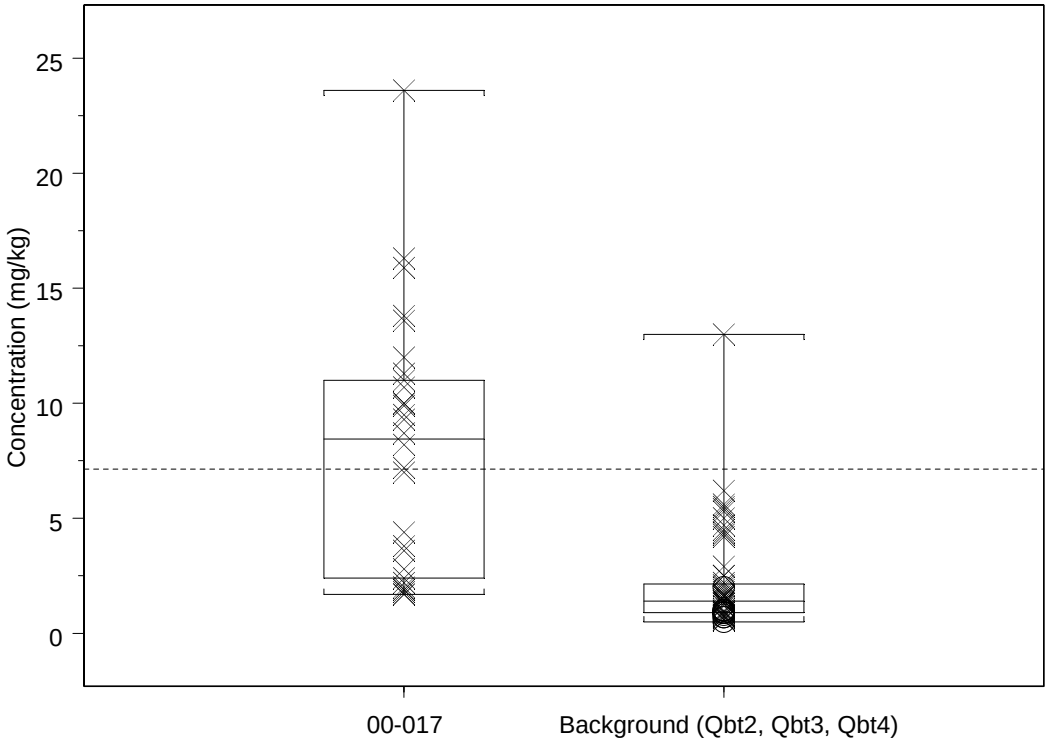


Figure F-2.1-9 Site concentrations of chromium in tuff at SWMU 00-017 compared to background

(× = detect, ○ = nondetect)

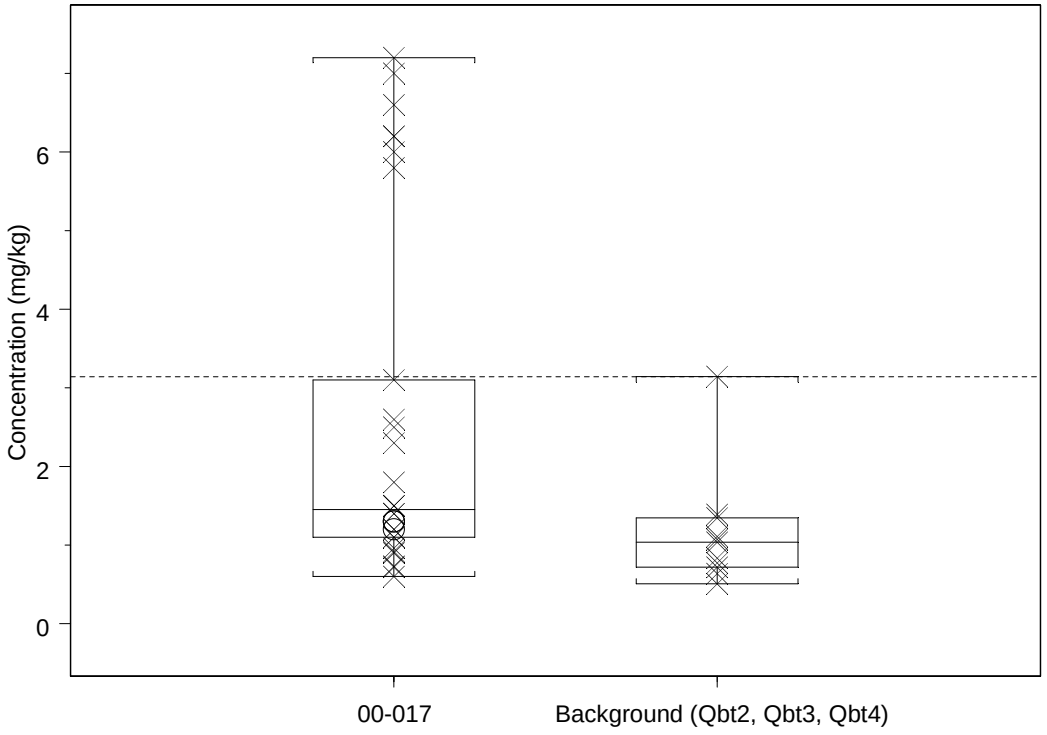


Figure F-2.1-10 Site concentrations of cobalt in tuff at SWMU 00-017 compared to background

(× = detect, ○ = nondetect)

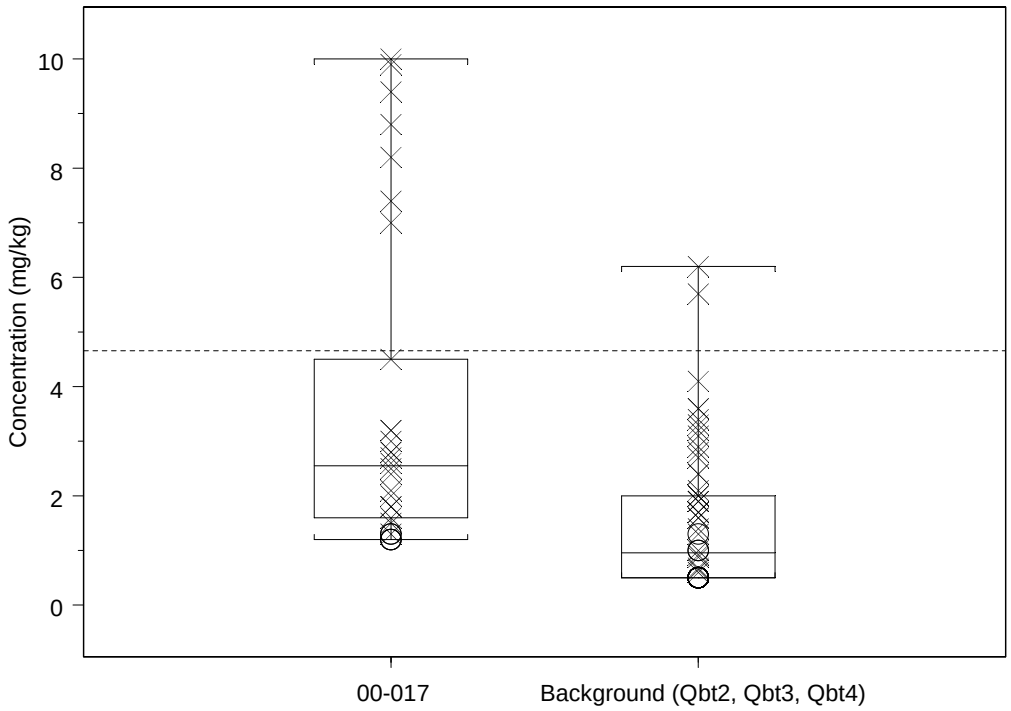


Figure F-2.1-11 Site concentrations of copper in tuff at SWMU 00-017 compared to background
(× = detect, ○ = nondetect)

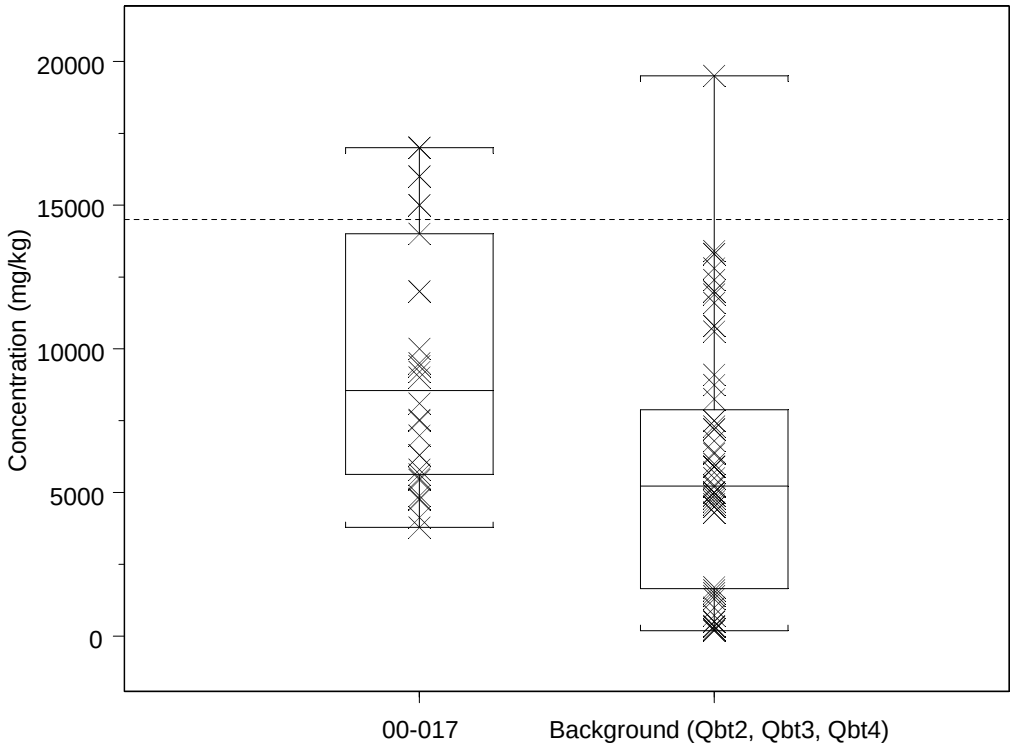


Figure F-2.1-12 Site concentrations of iron in tuff at SWMU 00-017 compared to background
(× = detect, ○ = nondetect)

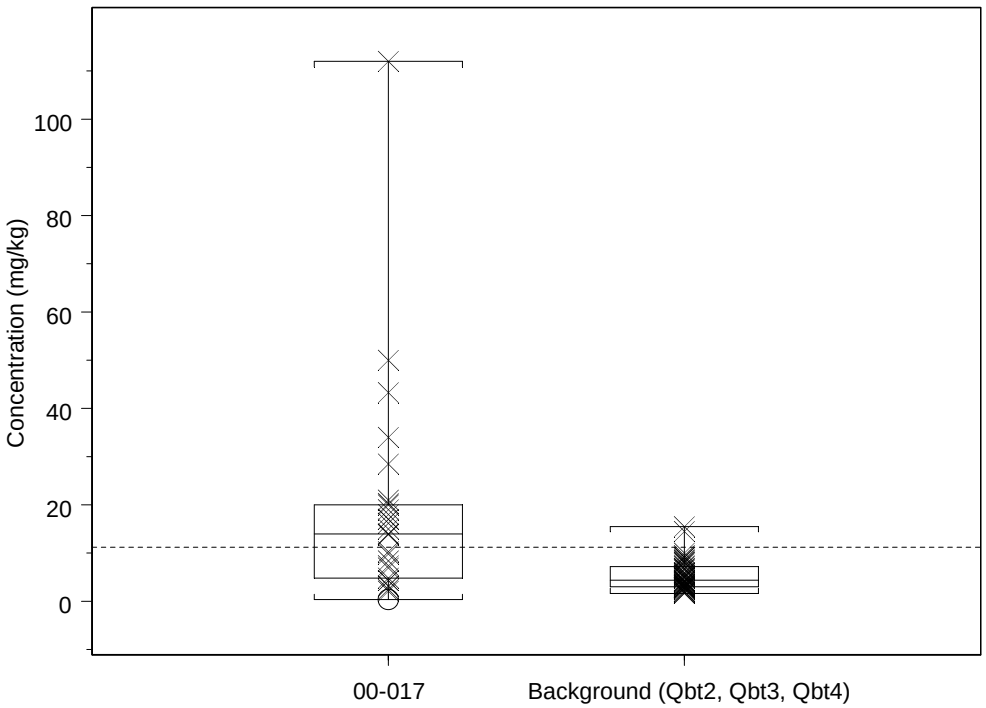


Figure F-2.1-13 Site concentrations of lead in tuff at SWMU 00-017 compared to background
(× = detect, ○ = nondetect)

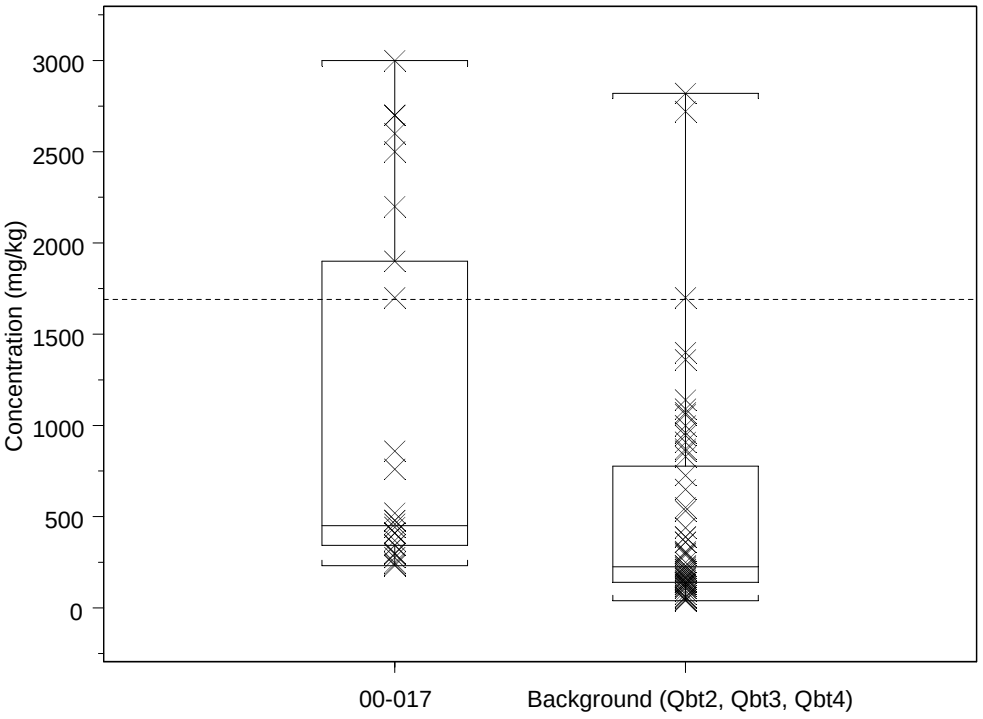


Figure F-2.1-14 Site concentrations of magnesium in tuff at SWMU 00-017 compared to background
(× = detect, ○ = nondetect)

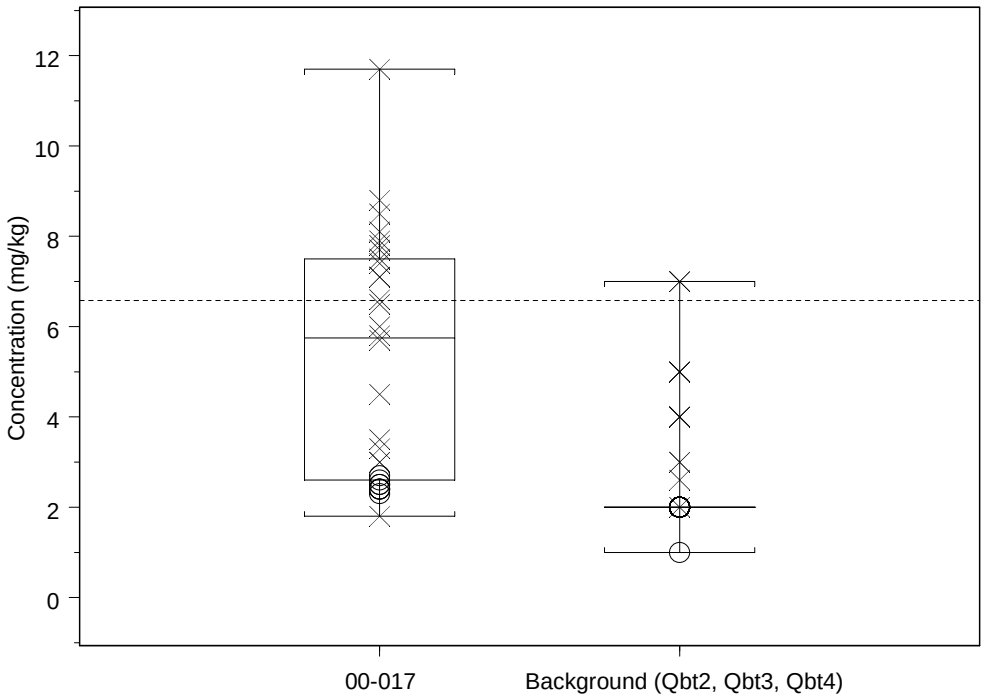


Figure F-2.1-15 Site concentrations of nickel in tuff at SWMU 00-017 compared to background
(× = detect, ○ = nondetect)

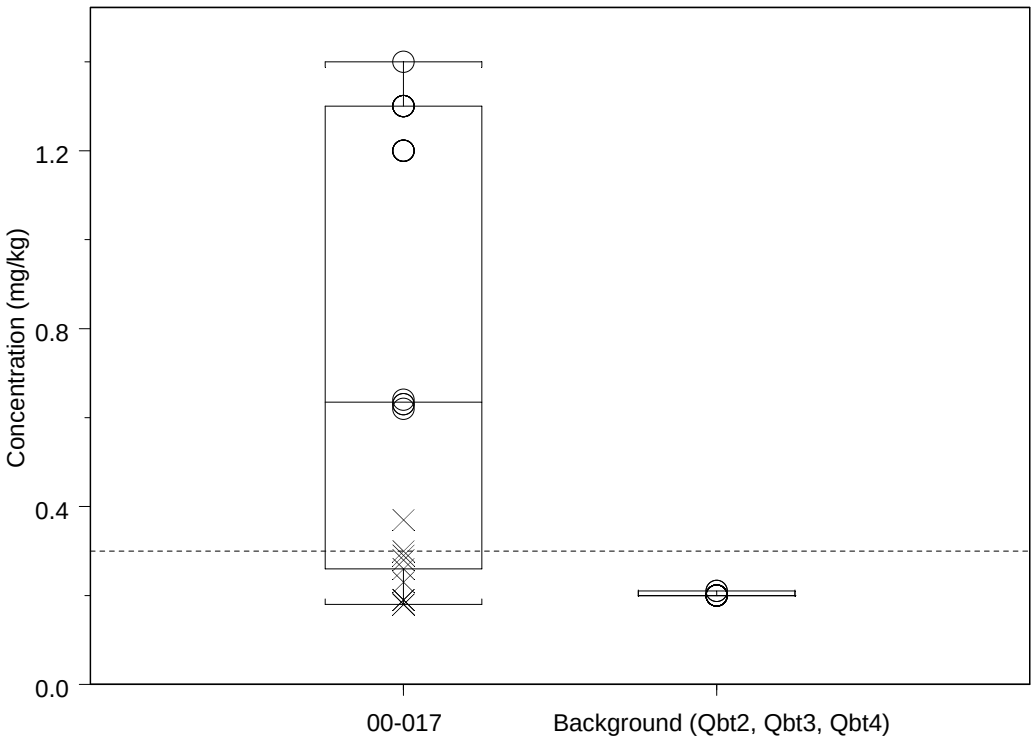


Figure F-2.1-16 Site concentrations of selenium in tuff at SWMU 00-017 compared to background
(× = detect, ○ = nondetect)

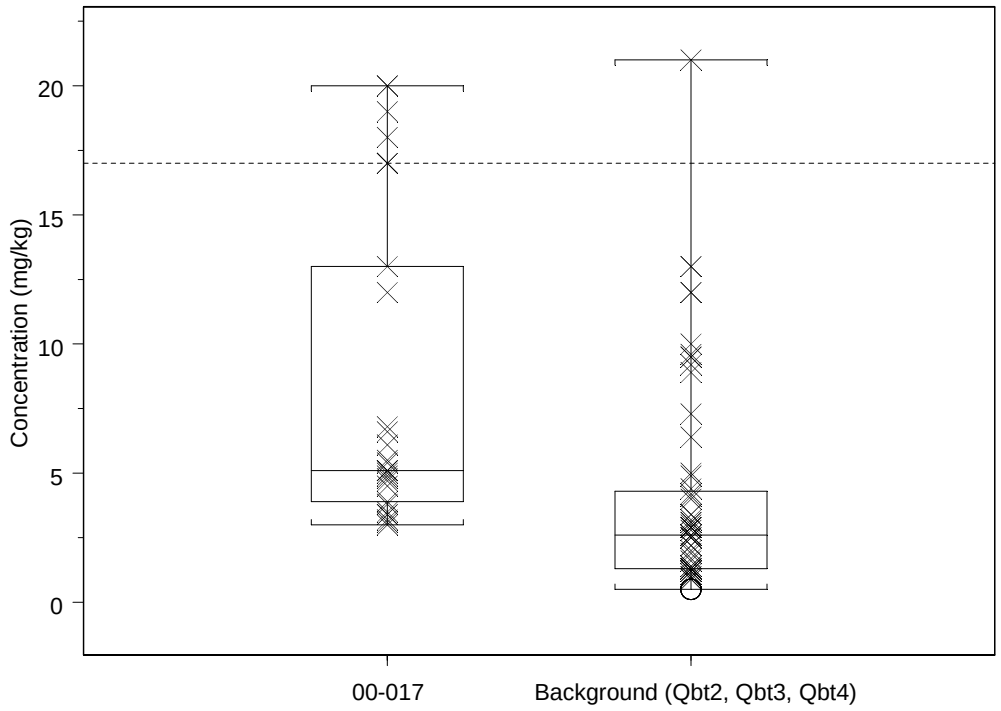


Figure F-2.1-17 Site concentrations of vanadium in tuff at SWMU 00-017 compared to background

(× = detect, ○ = nondetect)

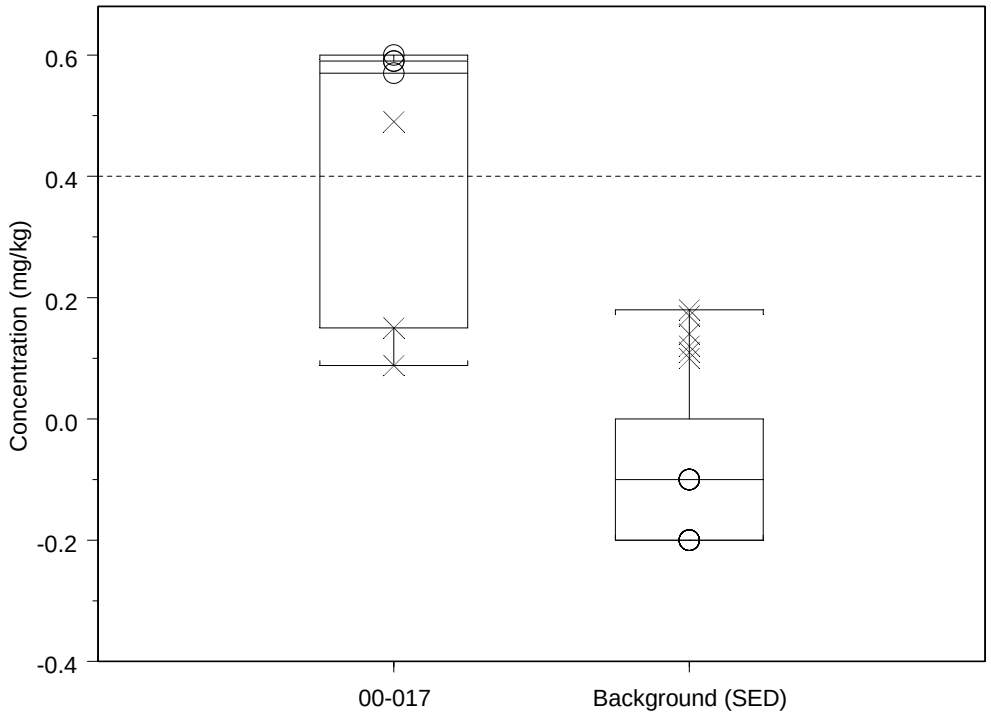


Figure F-2.1-18 Site concentrations of cadmium in sediment at SWMU 00-017 compared to background

(× = detect, ○ = nondetect)



Figure F-2.1-19 Site concentrations of lead in sediment at SWMU 00-017 compared to background

(× = detect, ○ = nondetect)

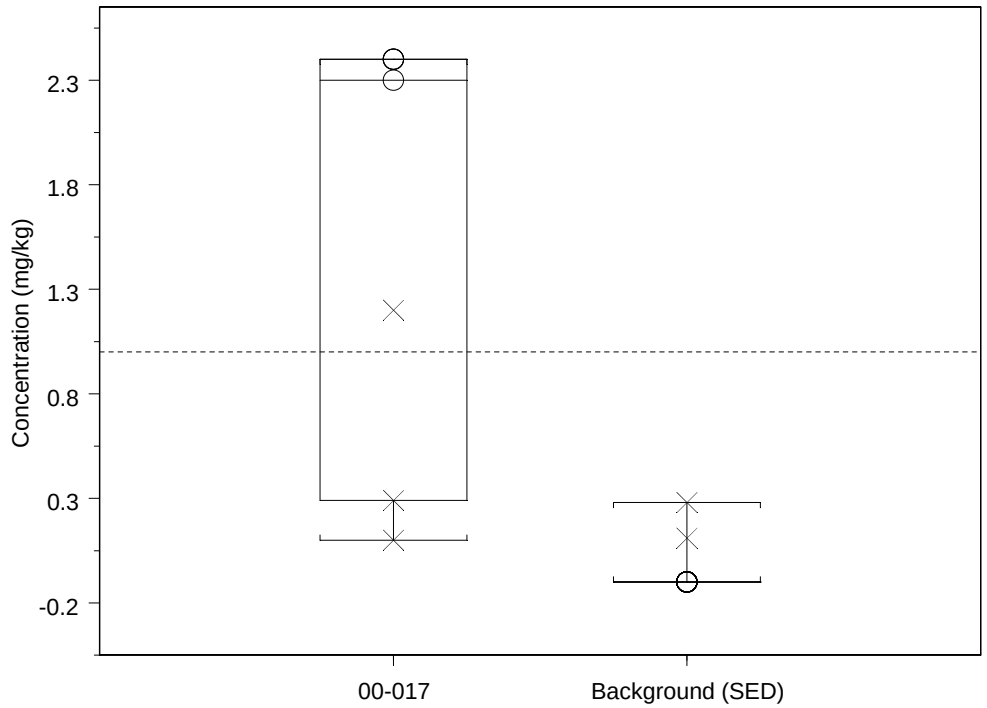


Figure F-2.1-20 Site concentrations of silver in sediment at SWMU 00-017 compared to background

(× = detect, ○ = nondetect)

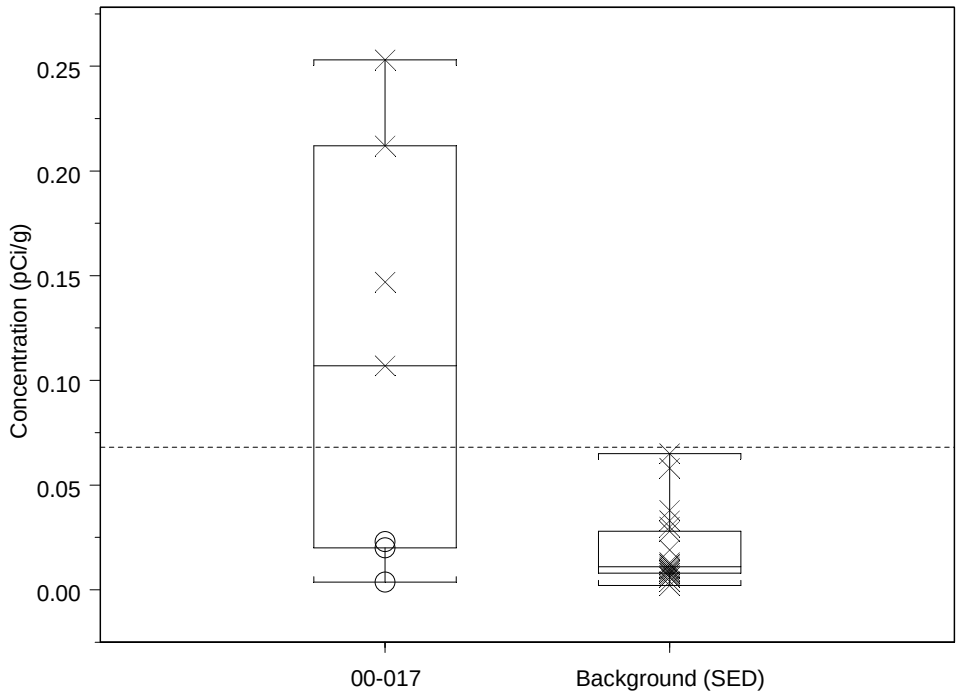


Figure F-2.1-21 Site concentrations of plutonium-239/240 in sediment at SWMU 00-017 compared to background

(× = detect, ○ = nondetect)

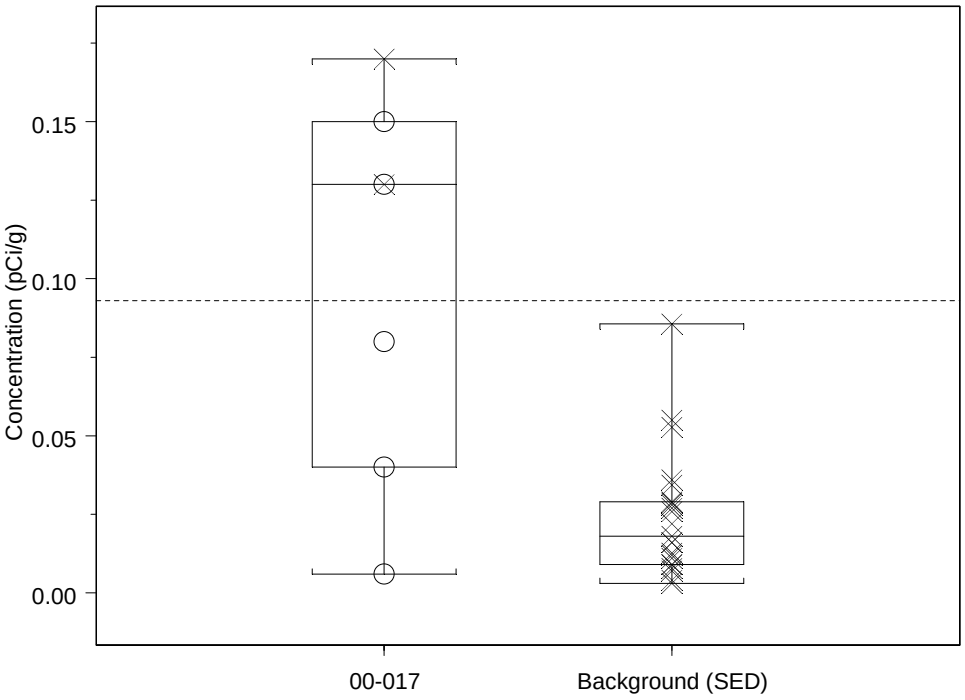


Figure F-2.1-22 Site concentrations of tritium in sediment at SWMU 00-017 compared to background

(× = detect, ○ = nondetect)

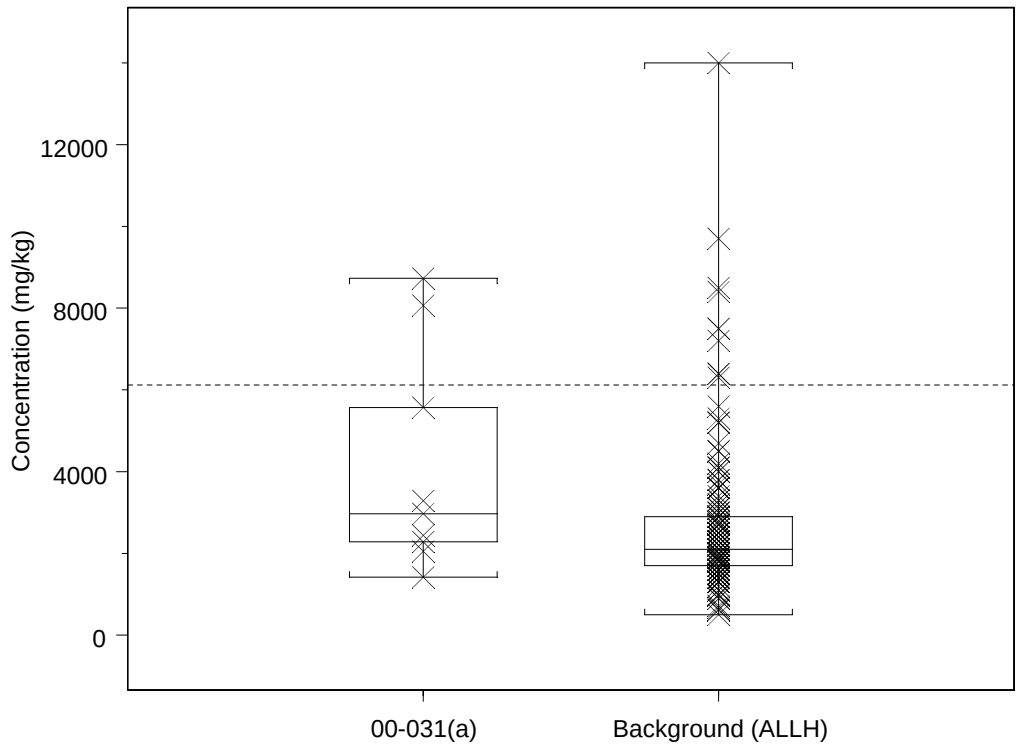


Figure F-2.2-1 Site concentrations of calcium in soil at AOC C-00-031(a) compared to background

(× = detect, ○ = nondetect)

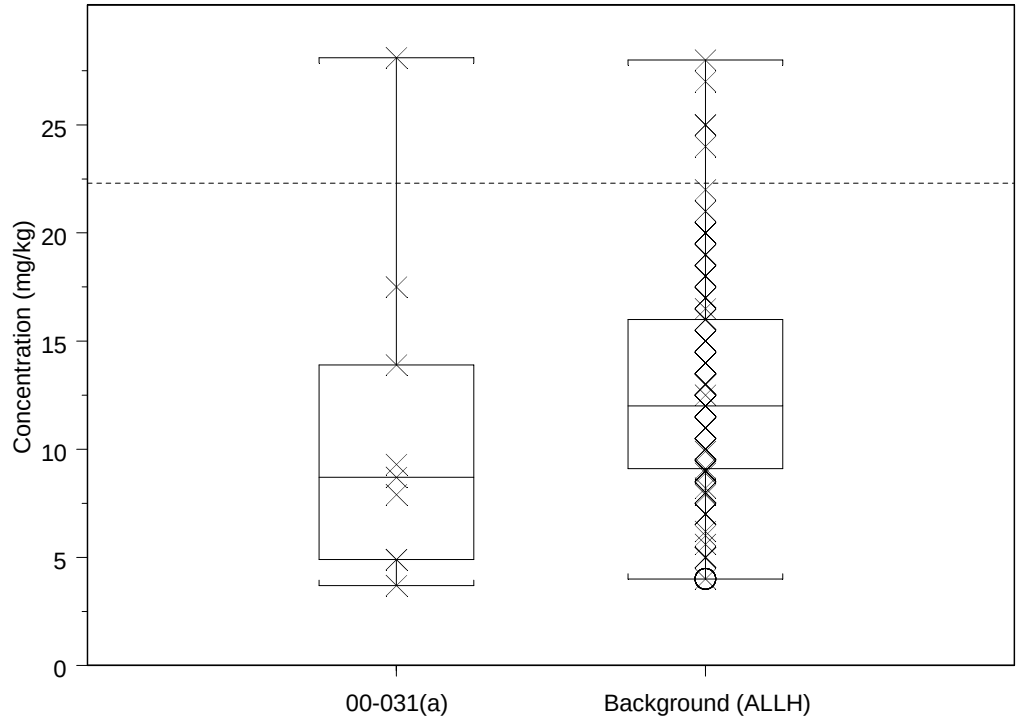


Figure F-2.2-2 Site concentrations of lead in soil at AOC C-00-031(a) compared to background

(× = detect, ○ = nondetect)

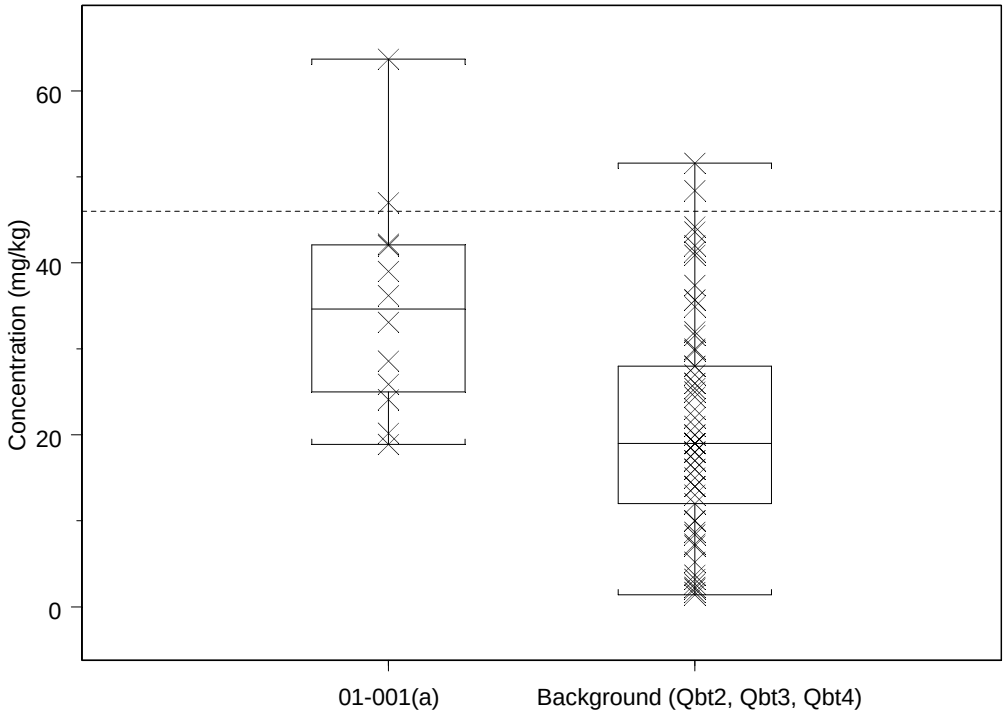


Figure F-3.1-1 Site concentrations of barium in tuff at SWMU 01-001(a) compared to background
(× = detect, ○ = nondetect)

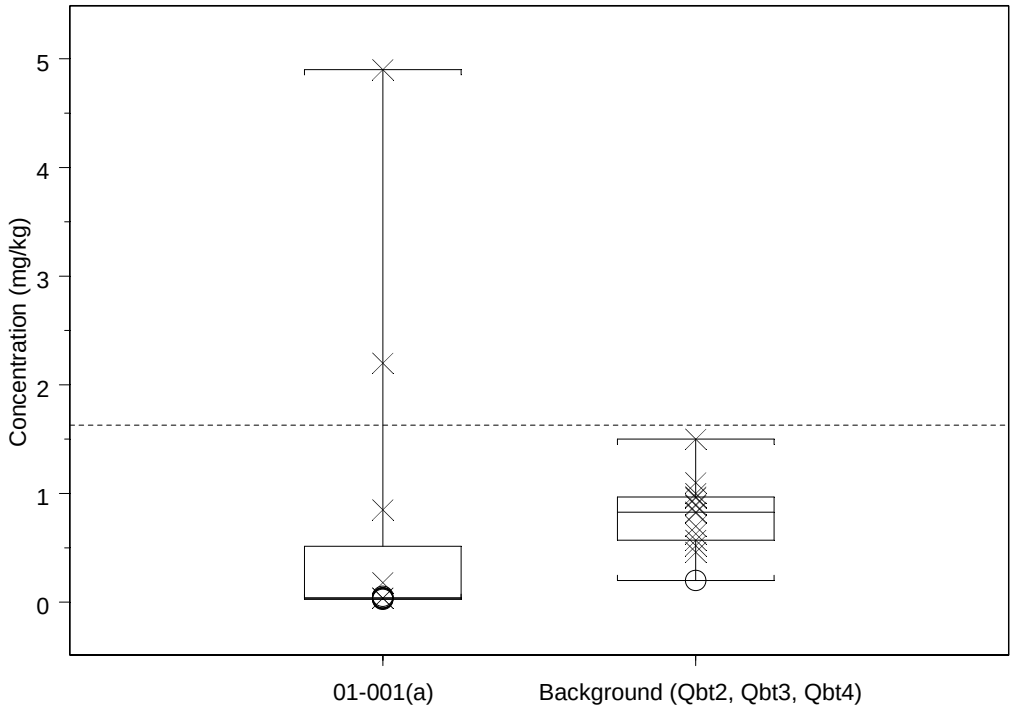


Figure F-3.1-2 Site concentrations of cadmium in tuff at SWMU 01-001(a) compared to background
(× = detect, ○ = nondetect)

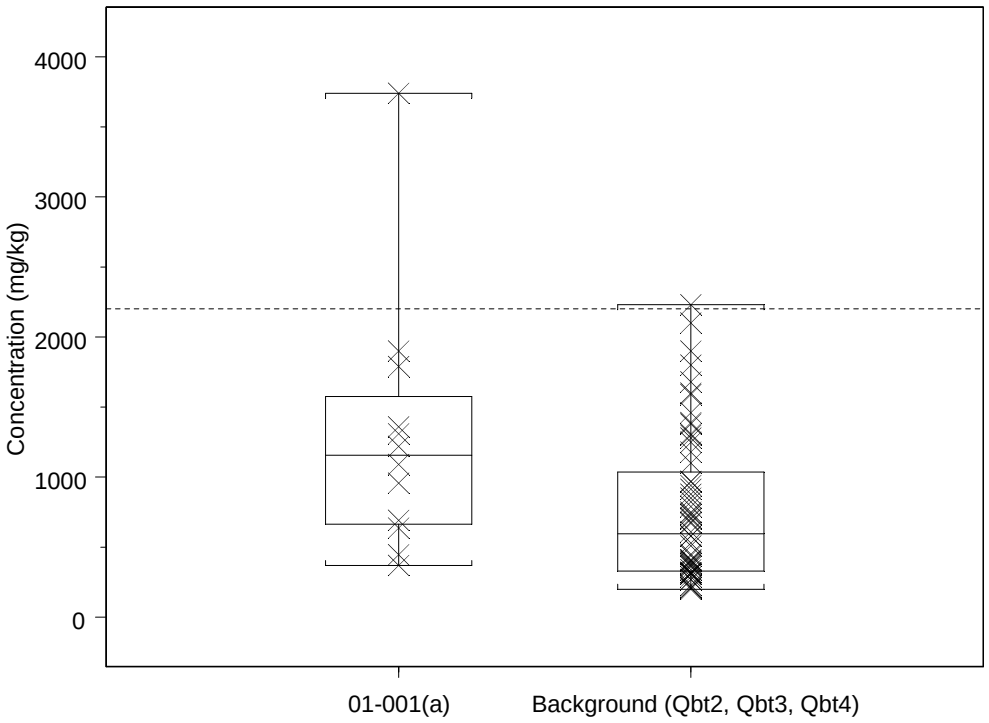


Figure F-3.1-3 Site concentrations of calcium in tuff at SWMU 01-001(a) compared to background

(× = detect, ○ = nondetect)

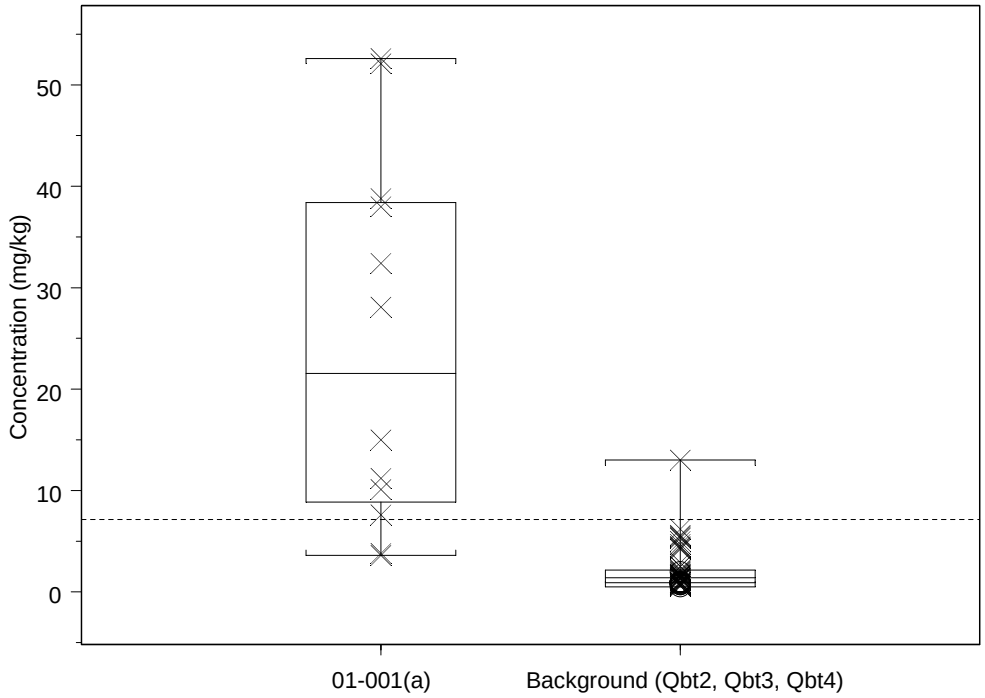


Figure F-3.1-4 Site concentrations of chromium in tuff at SWMU 01-001(a) compared to background

(× = detect, ○ = nondetect)

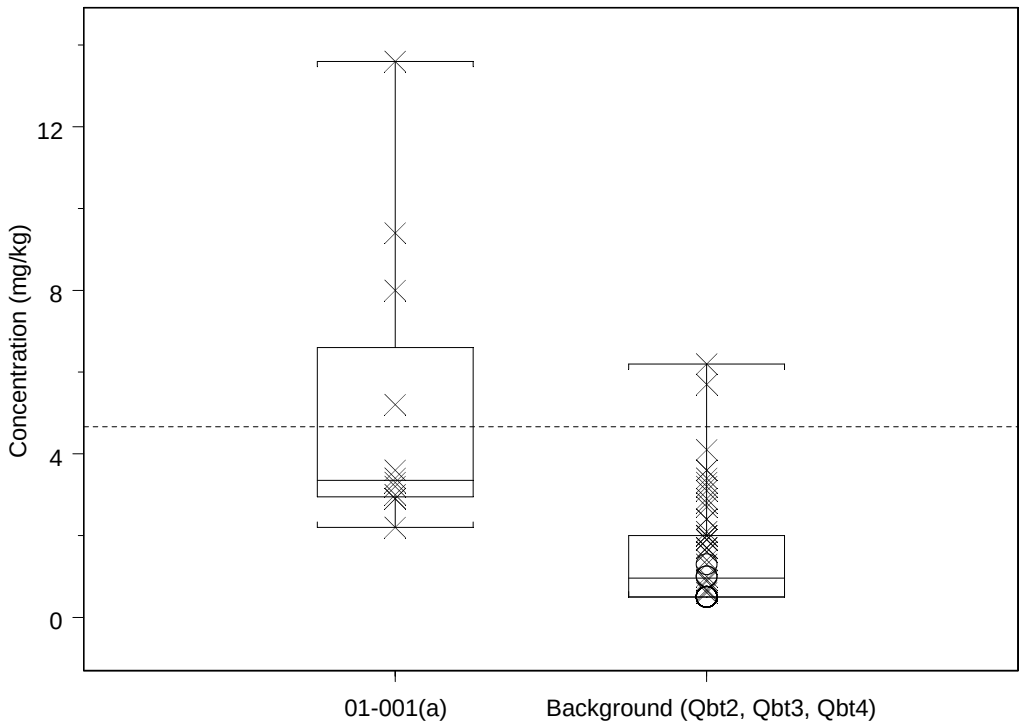


Figure F-3.1-5 Site concentrations of copper in tuff at SWMU 01-001(a) compared to background
(× = detect, ○ = nondetect)

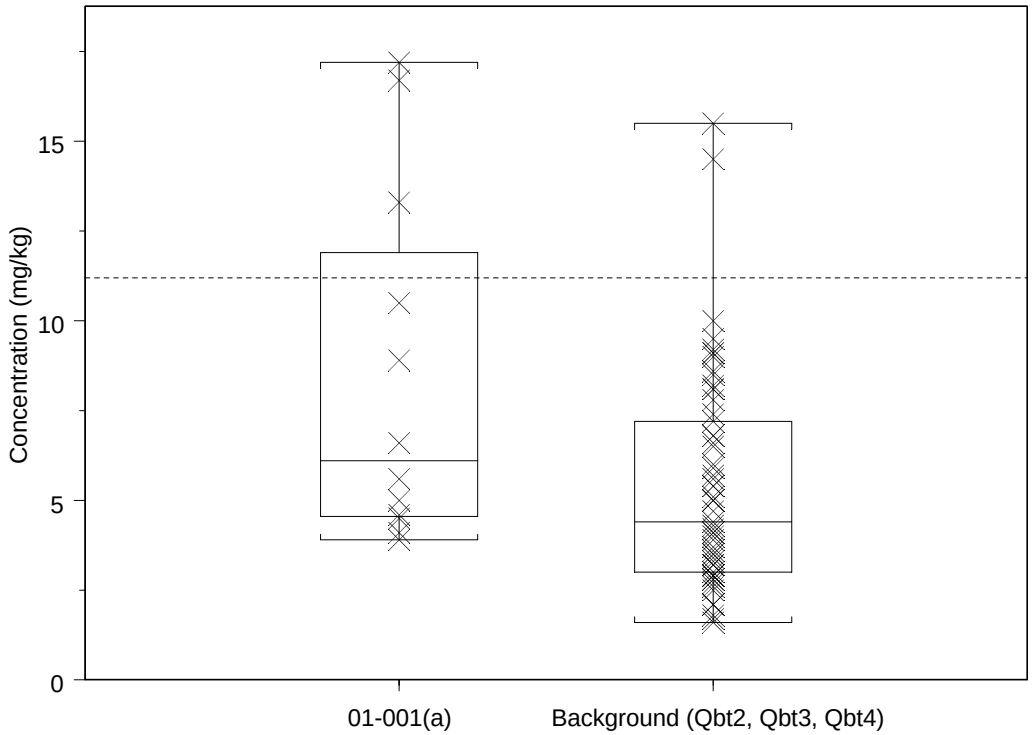


Figure F-3.1-6 Site concentrations of lead in tuff at SWMU 01-001(a) compared to background
(× = detect, ○ = nondetect)

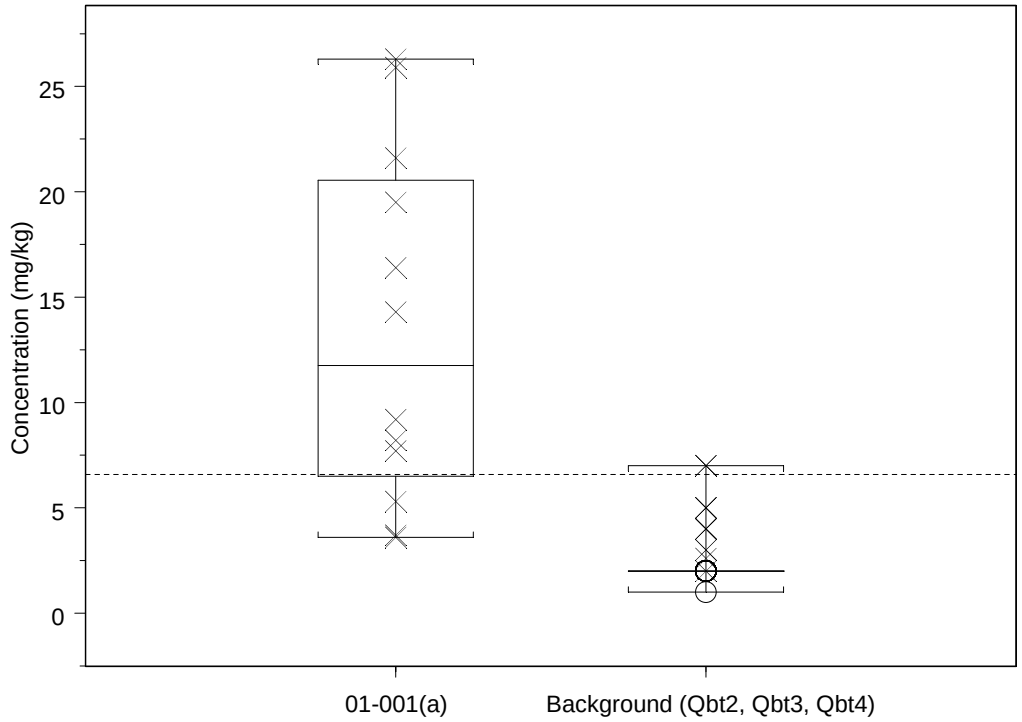


Figure F-3.1-7 Site concentrations of nickel in tuff at SWMU 01-001(a) compared to background
(× = detect, ○ = nondetect)

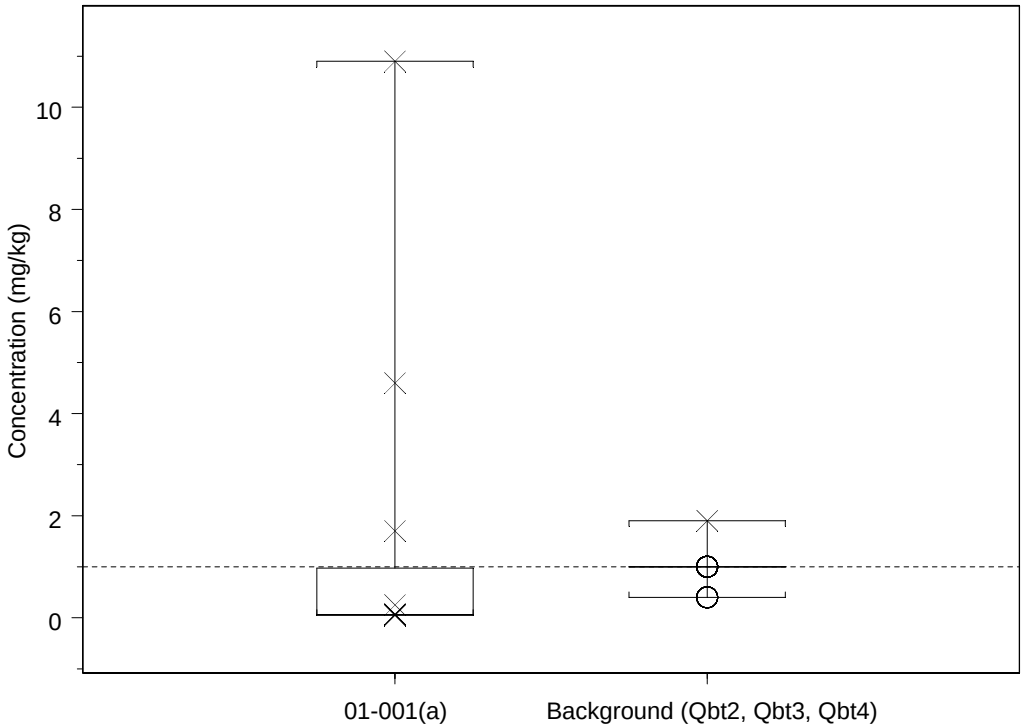


Figure F-3.1-8 Site concentrations of silver in tuff at SWMU 01-001(a) compared to background
(× = detect, ○ = nondetect)

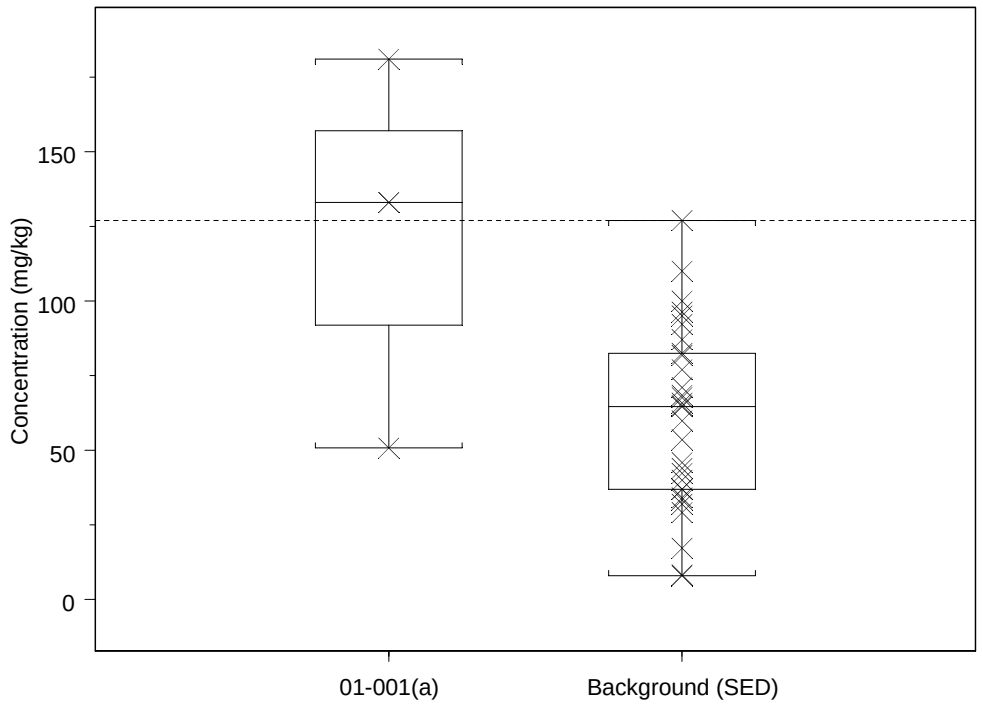


Figure F-3.1-9 Site concentrations of barium in sediment at SWMU 01-001(a) compared to background

(× = detect, ○ = nondetect)

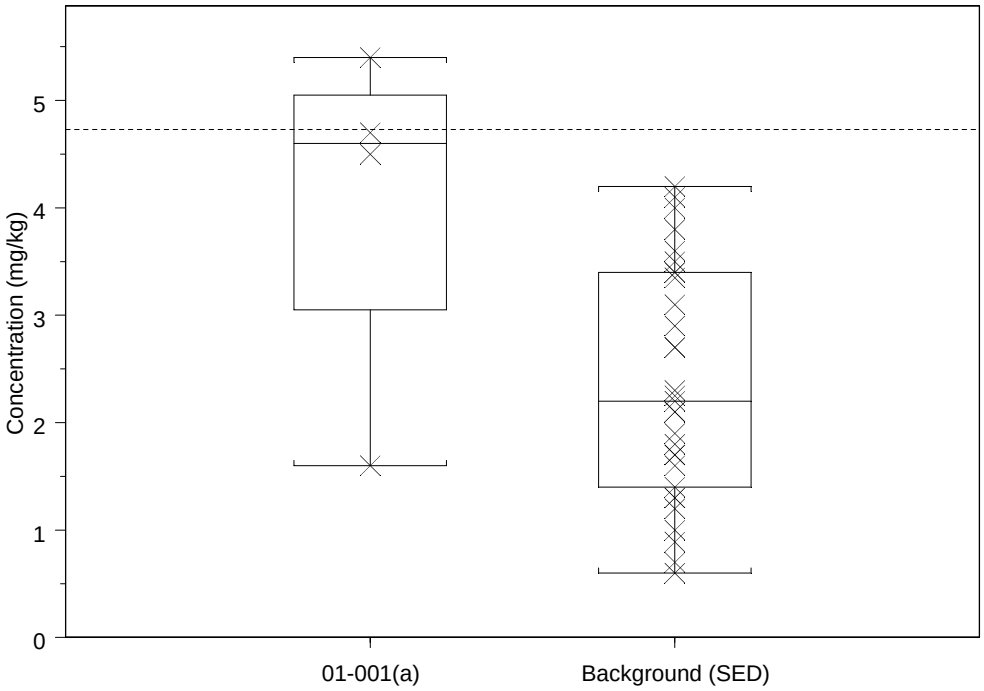


Figure F-3.1-10 Site concentrations of cobalt in sediment at SWMU 01-001(a) compared to background

(× = detect, ○ = nondetect)

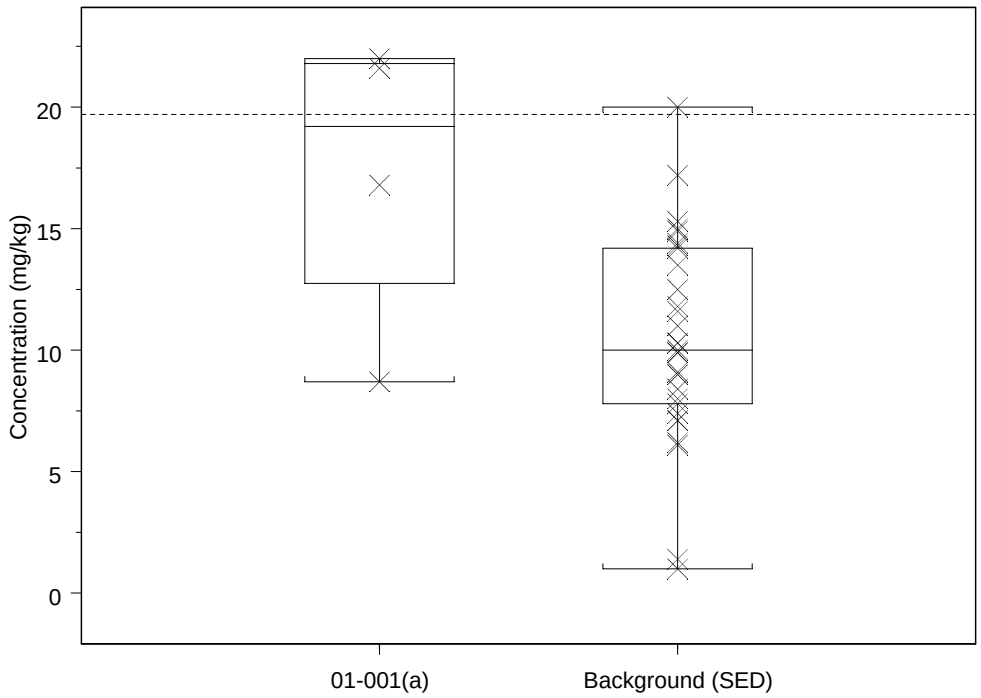


Figure F-3.1-11 Site concentrations of vanadium in sediment at SWMU 01-001(a) compared to background

(× = detect, ○ = nondetect)

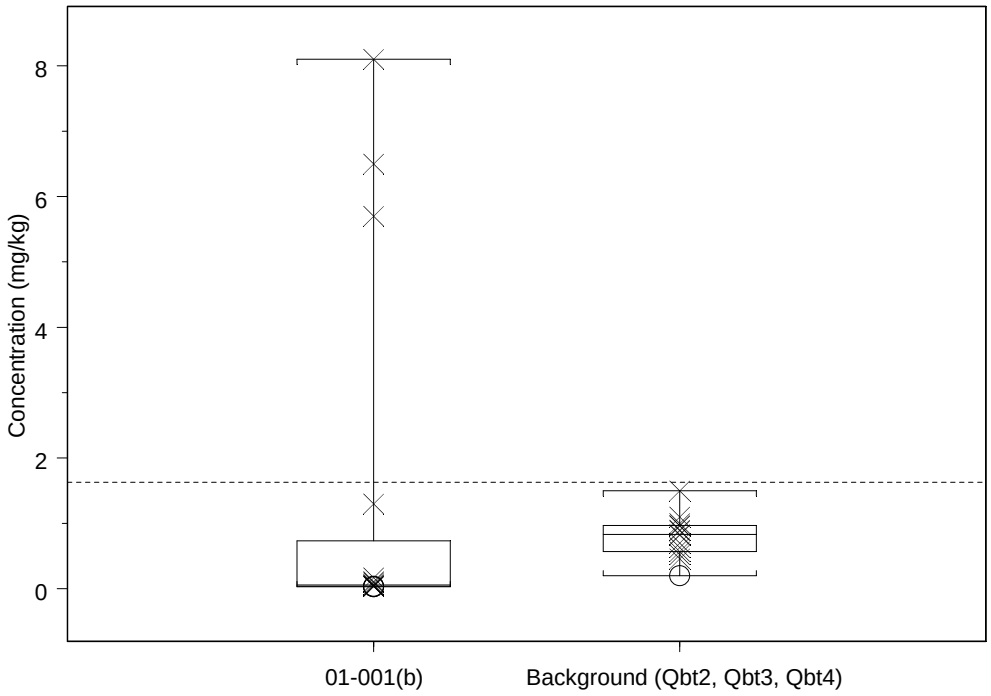


Figure F-3.2-1 Site concentrations of cadmium in tuff at SWMU 01-001(b) compared to background

(× = detect, ○ = nondetect)

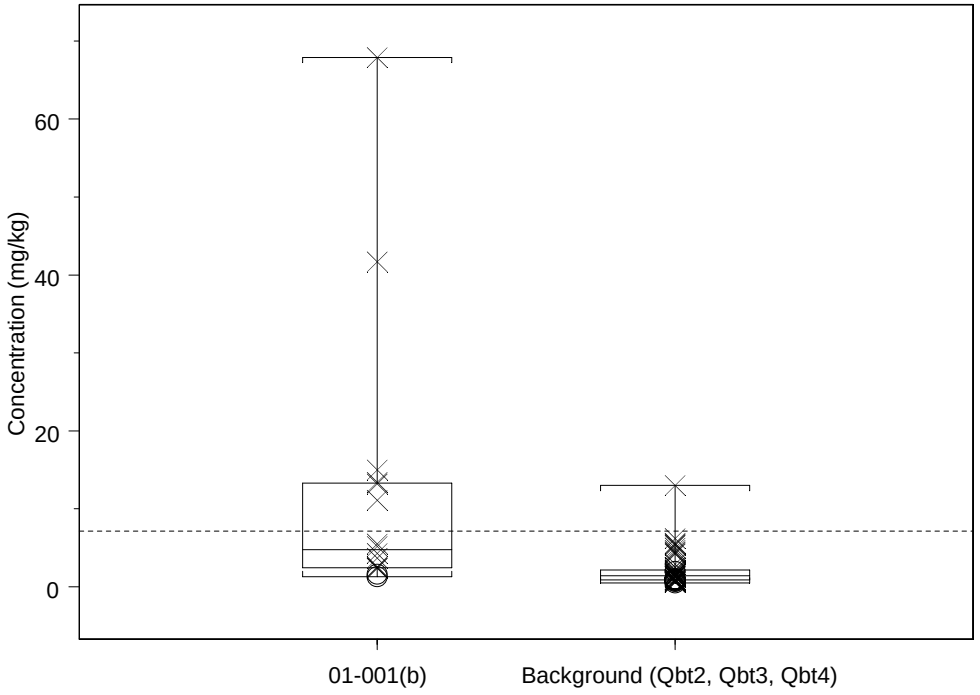


Figure F-3.2-2 Site concentrations of chromium in tuff at SWMU 01-001(b) compared to background

(× = detect, ○ = nondetect)

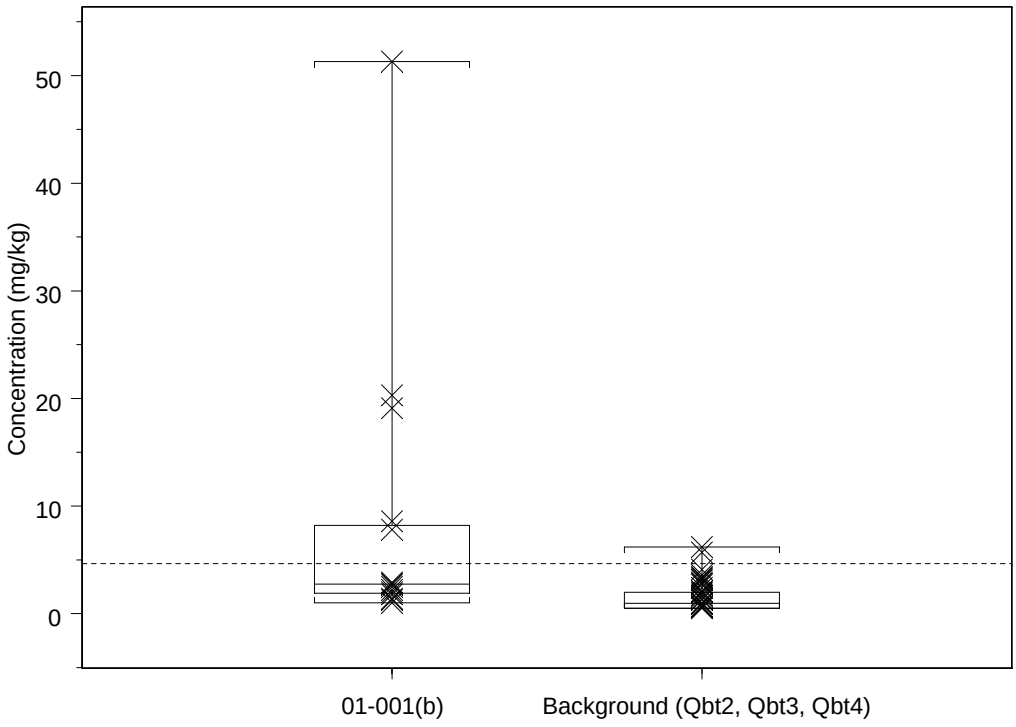


Figure F-3.2-3 Site concentrations of copper in tuff at SWMU 01-001(b) compared to background

(× = detect, ○ = nondetect)

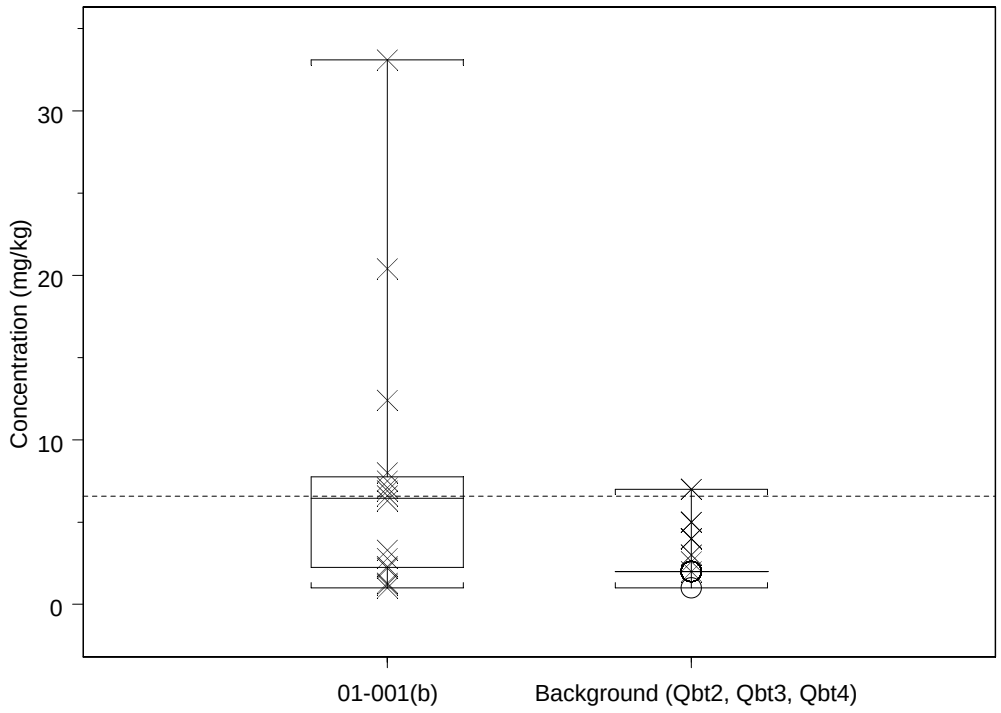


Figure F-3.2-4 Site concentrations of nickel in tuff at SWMU 01-001(b) compared to background

(× = detect, ○ = nondetect)

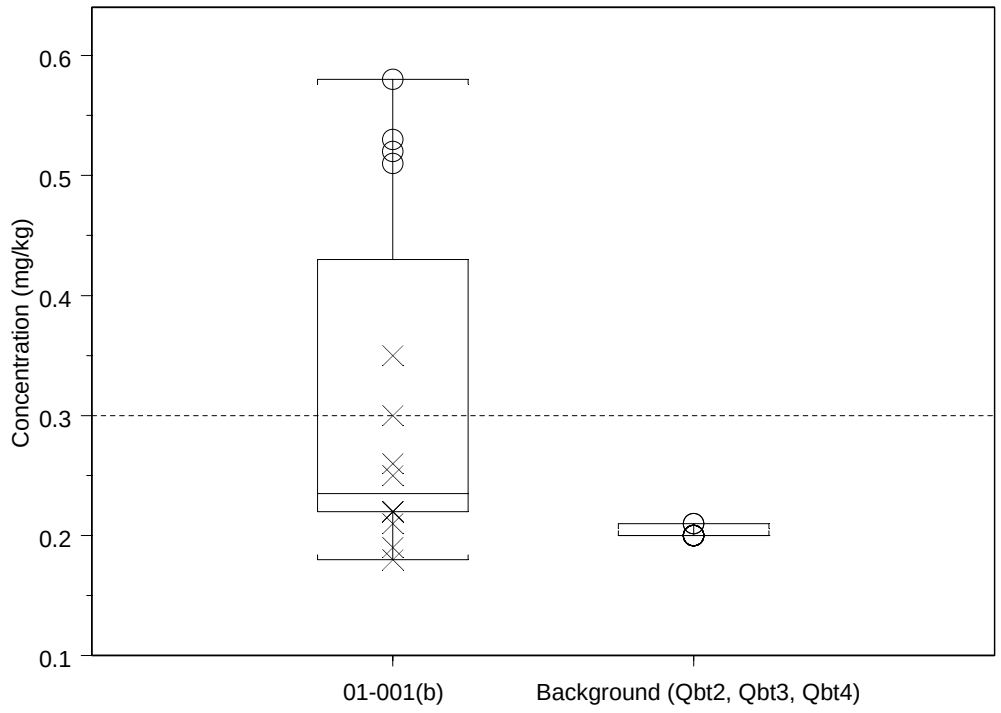


Figure F-3.2-5 Site concentrations of selenium in tuff at SWMU 01-001(b) compared to background

(× = detect, ○ = nondetect)

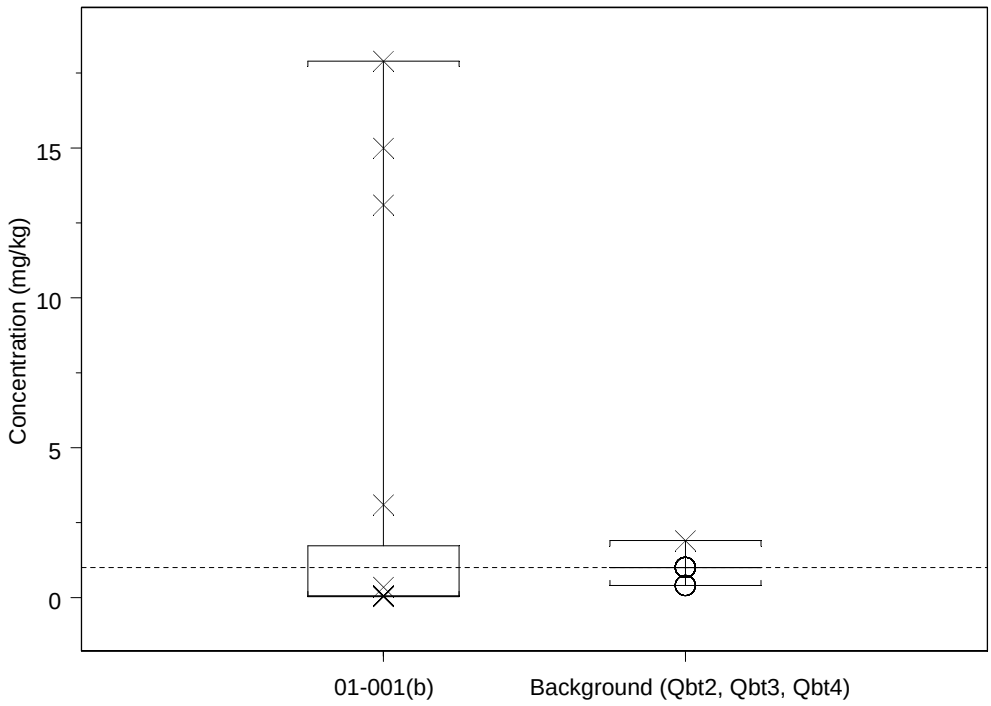


Figure F-3.2-6 Site concentrations of silver in tuff at SWMU 01-001(b) compared to background
(× = detect, ○ = nondetect)

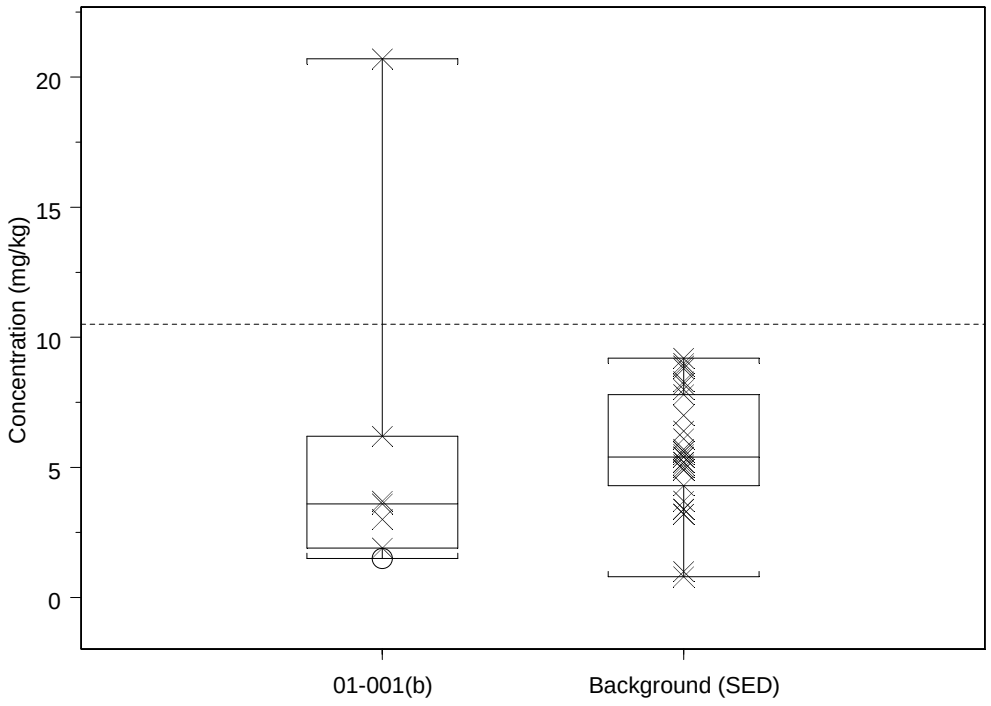


Figure F-3.2-7 Site concentrations of chromium in sediment at SWMU 01-001(b) compared to background

(× = detect, ○ = nondetect)

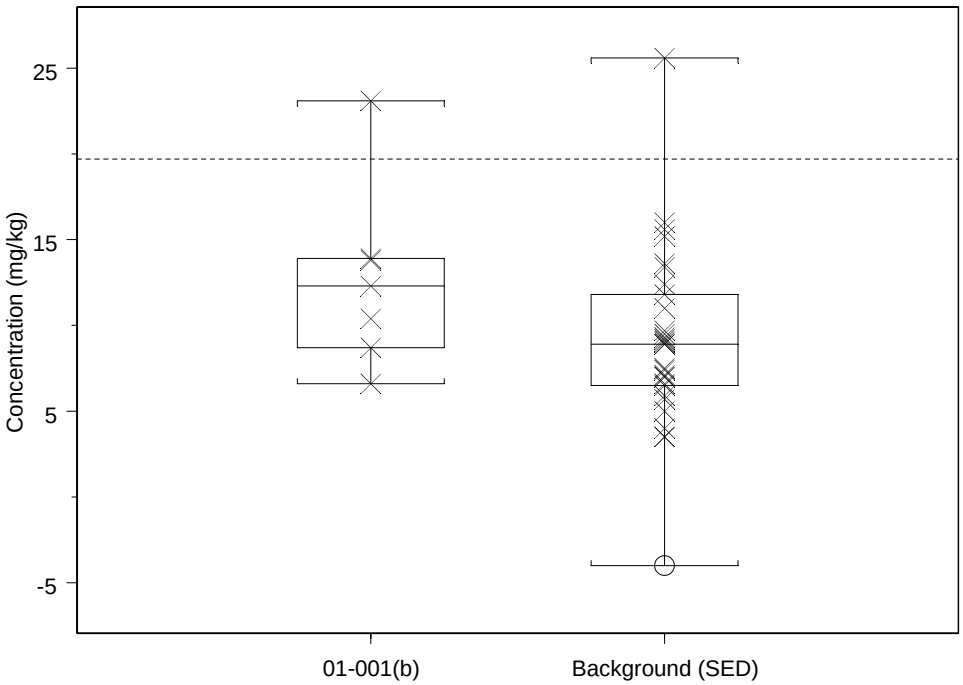


Figure F-3.2-8 Site concentrations of lead in sediment at SWMU 01-001(b) compared to background

(× = detect, ○ = nondetect)

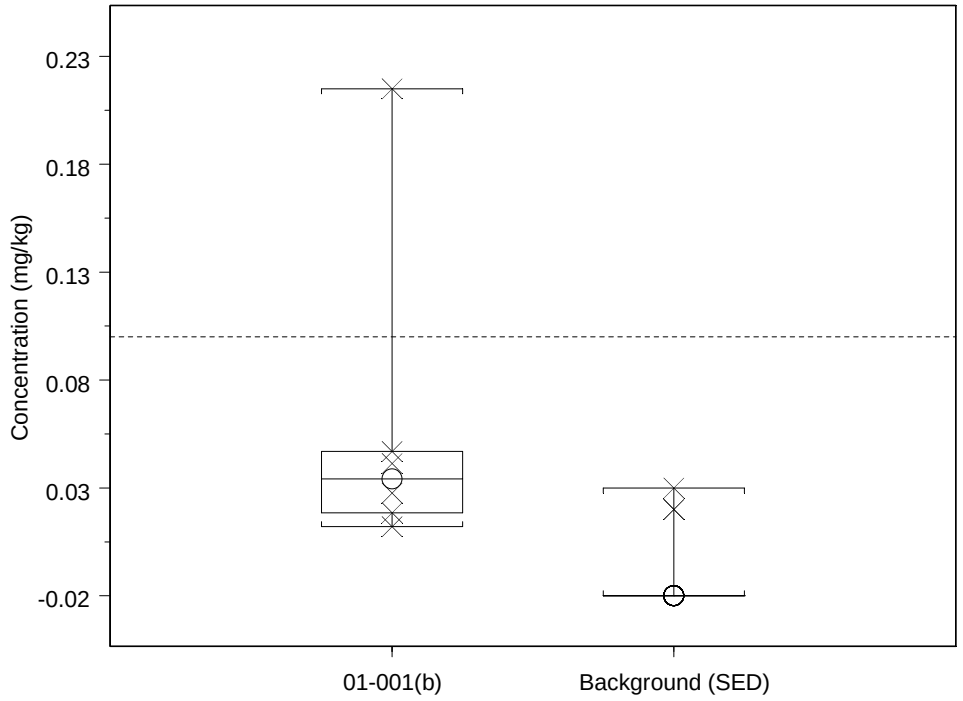


Figure F-3.2-9 Site concentrations of mercury in sediment at SWMU 01-001(b) compared to background

(× = detect, ○ = nondetect)

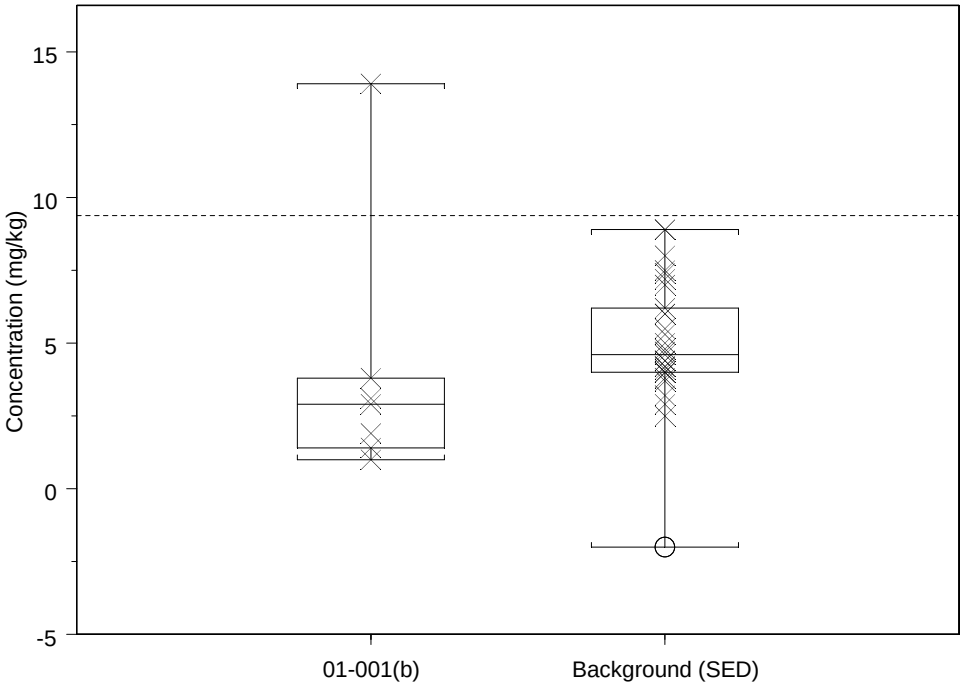


Figure F-3.2-10 Site concentrations of nickel in sediment at SWMU 01-001(b) compared to background

(× = detect, ○ = nondetect)

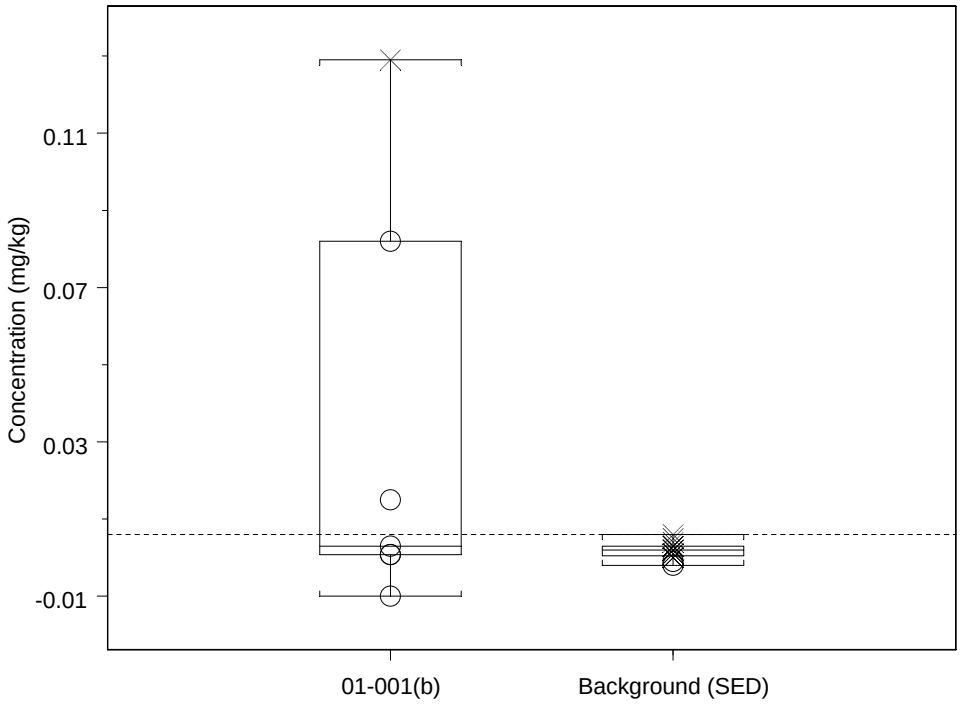


Figure F-3.2-11 Site concentrations of plutonium-238 in sediment at SWMU 01-001(b) compared to background

(× = detect, ○ = nondetect)

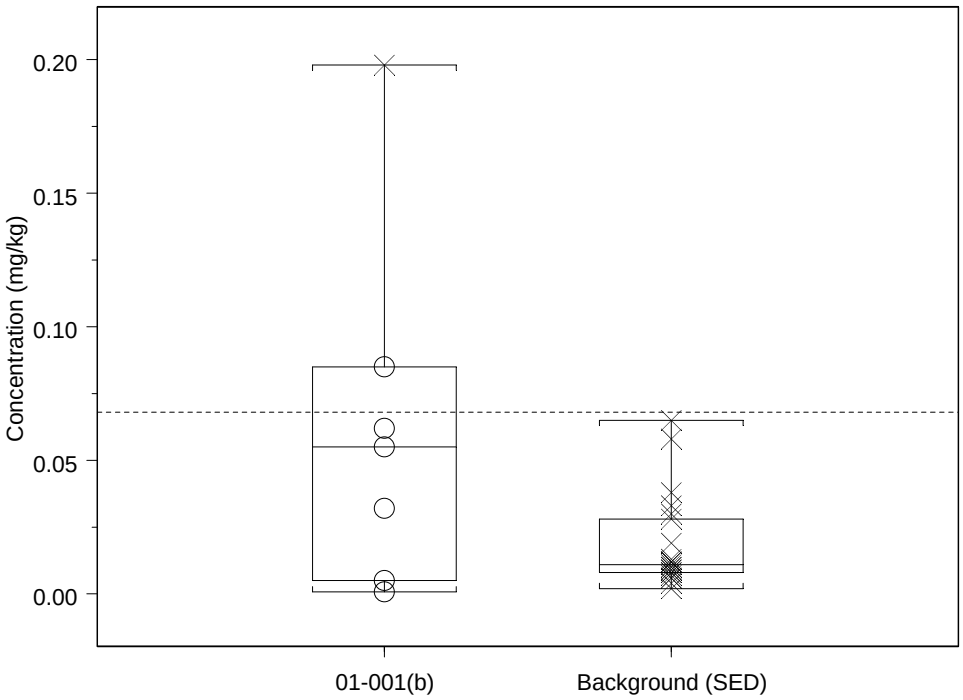


Figure F-3.2-12 Site concentrations of plutonium-239/240 in sediment at SWMU 01-001(b) compared to background

(× = detect, ○ = nondetect)

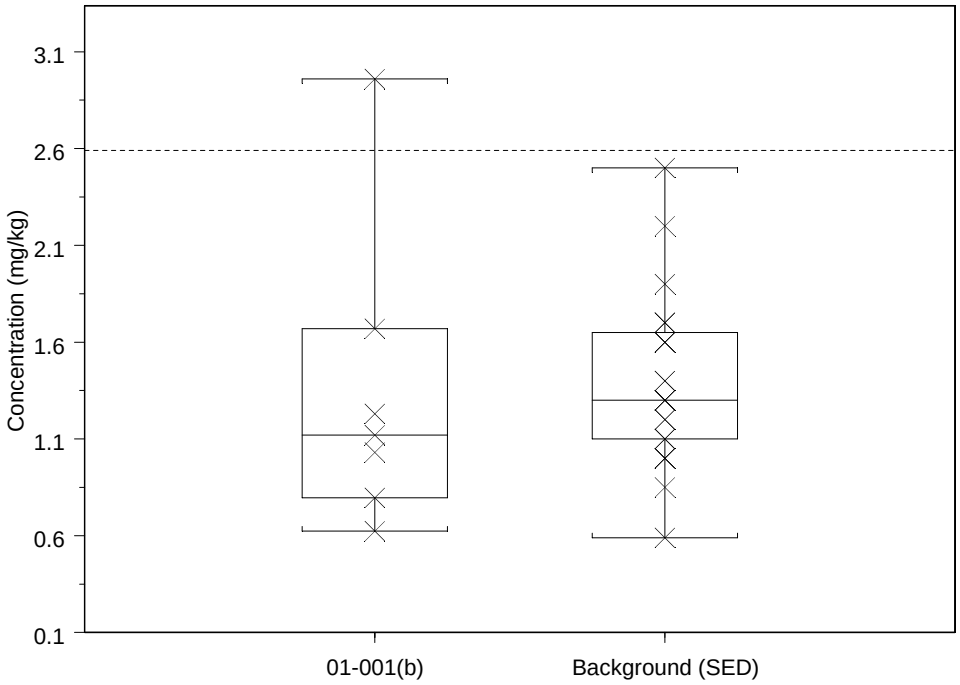


Figure F-3.2-13 Site concentrations of uranium-234 in sediment at SWMU 01-001(b) compared to background

(× = detect, ○ = nondetect)

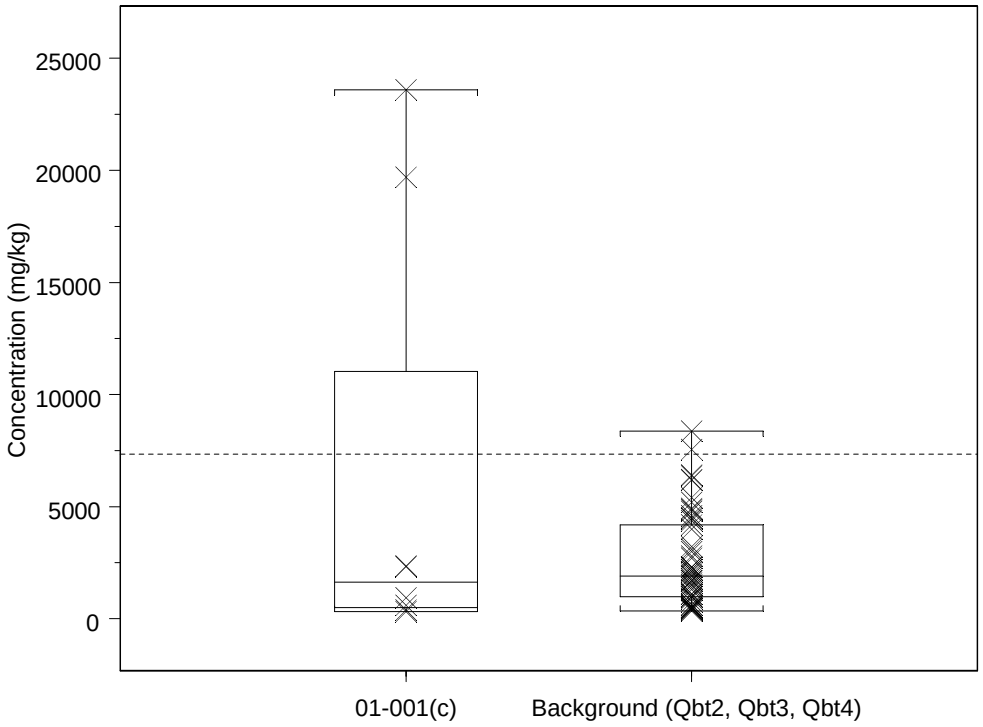


Figure F-3.3-1 Site concentrations of aluminum in tuff at SWMU 01-001(c) compared to background

(× = detect, ○ = nondetect)

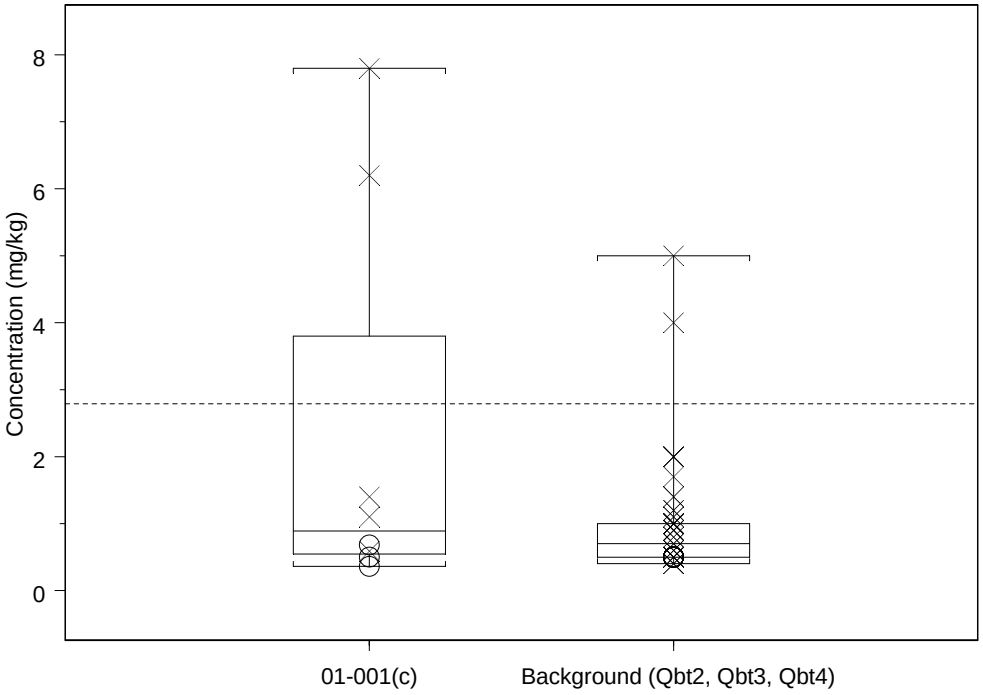


Figure F-3.3-2 Site concentrations of arsenic in tuff at SWMU 01-001(c) compared to background

(× = detect, ○ = nondetect)

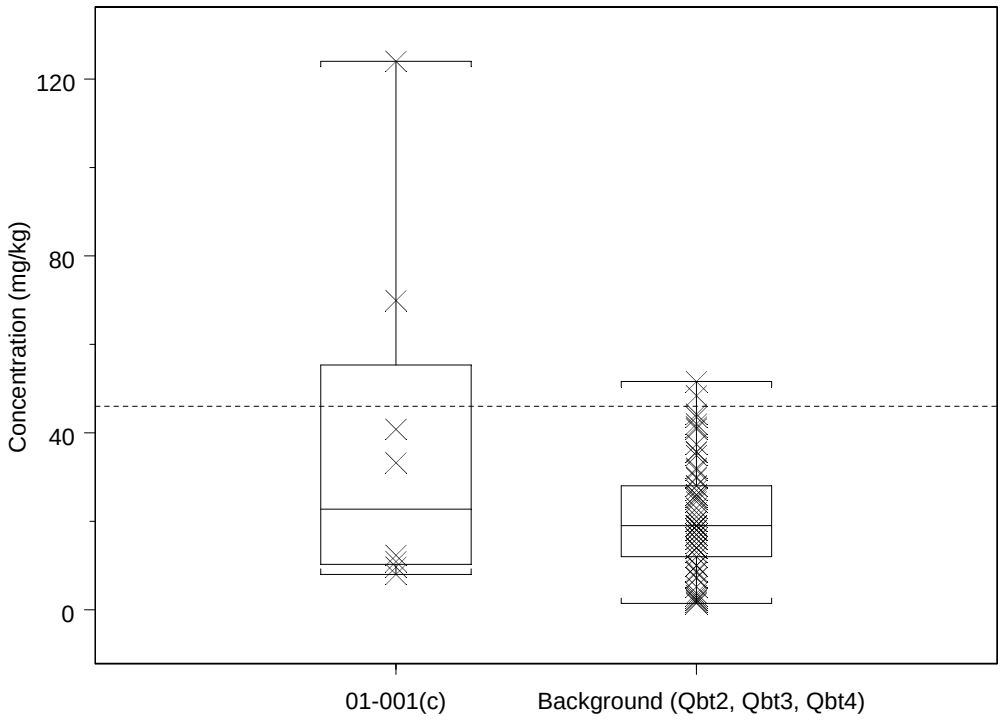


Figure F-3.3-3 Site concentrations of barium in tuff at SWMU 01-001(c) compared to background
(× = detect, ○ = nondetect)

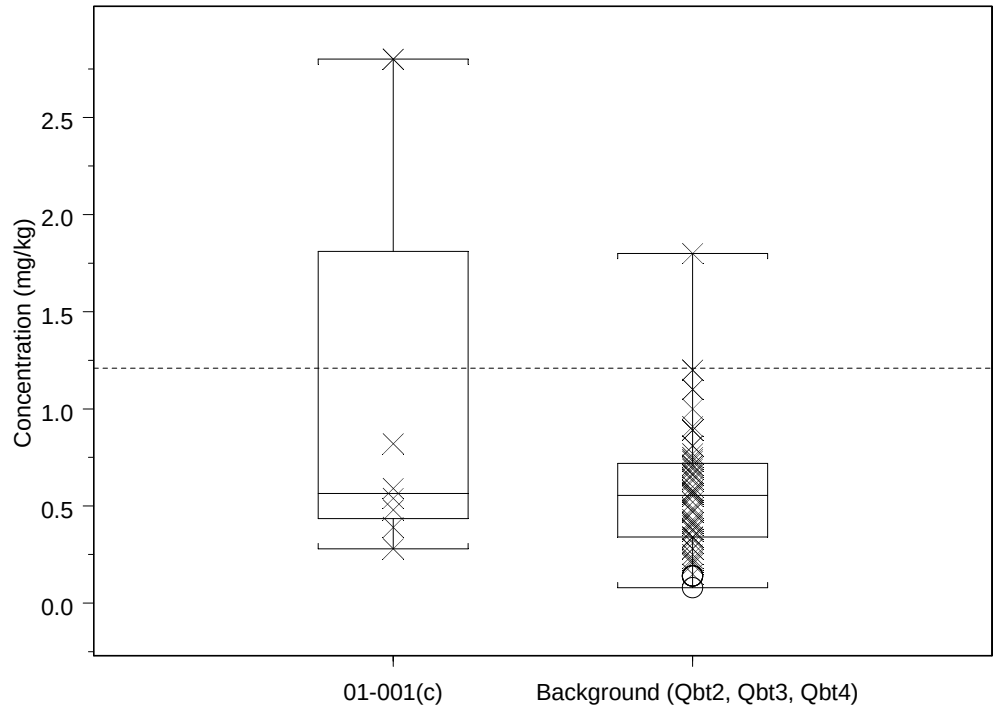


Figure F-3.3-4 Site concentrations of beryllium in tuff at SWMU 01-001(c) compared to background
(× = detect, ○ = nondetect)

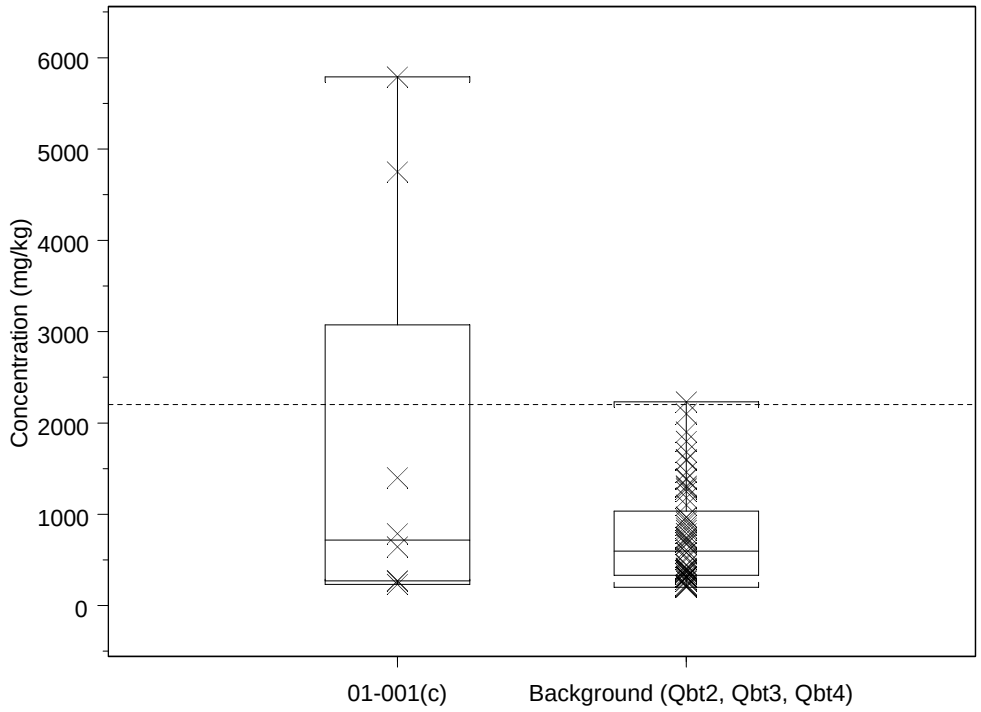


Figure F-3.3-5 Site concentrations of calcium in tuff at SWMU 01-001(c) compared to background

(× = detect, ○ = nondetect)

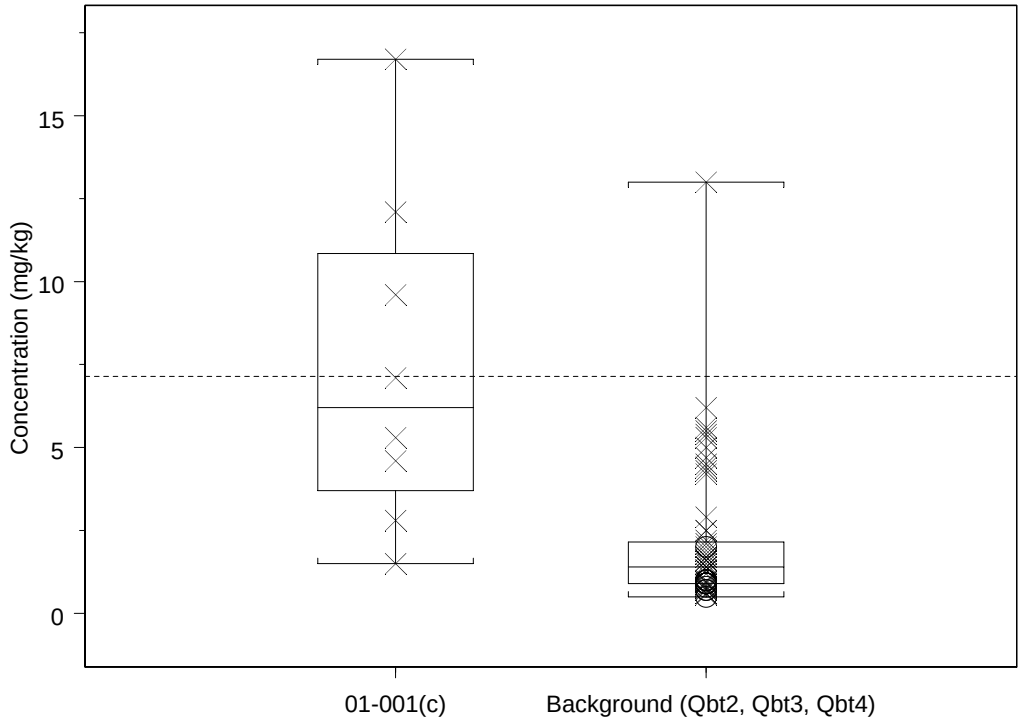


Figure F-3.3-6 Site concentrations of chromium in tuff at SWMU 01-001(c) compared to background

(× = detect, ○ = nondetect)

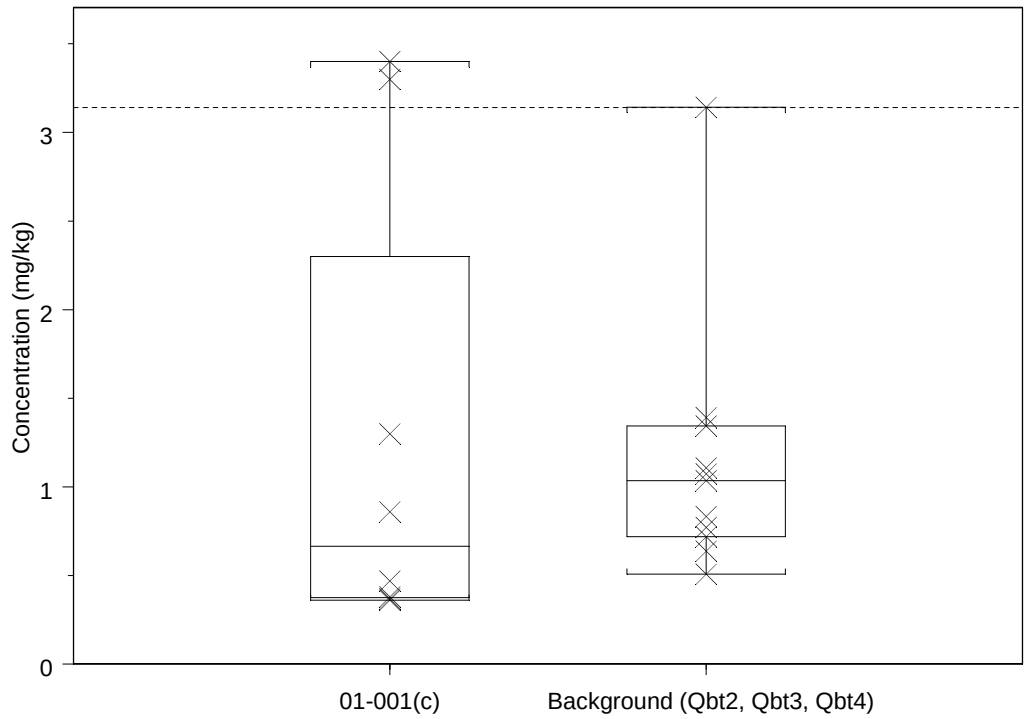


Figure F-3.3-7 Site concentrations of cobalt in tuff at SWMU 01-001(c) compared to background
(× = detect, ○ = nondetect)

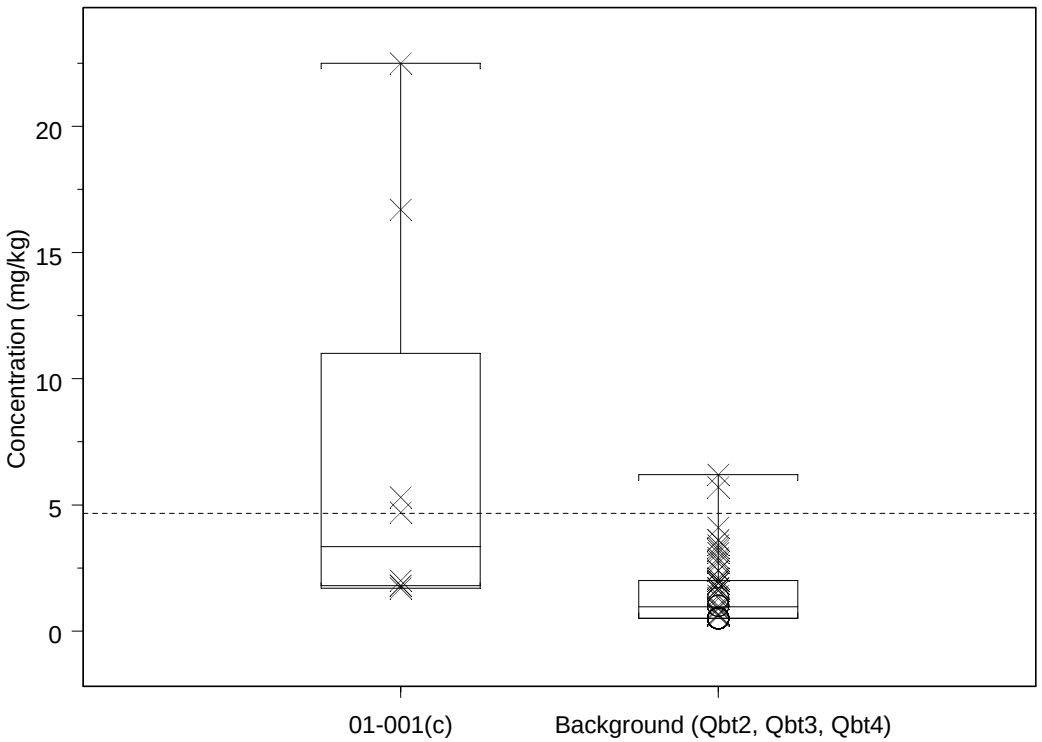


Figure F-3.3-8 Site concentrations of copper in tuff at SWMU 01-001(c) compared to background
(× = detect, ○ = nondetect)

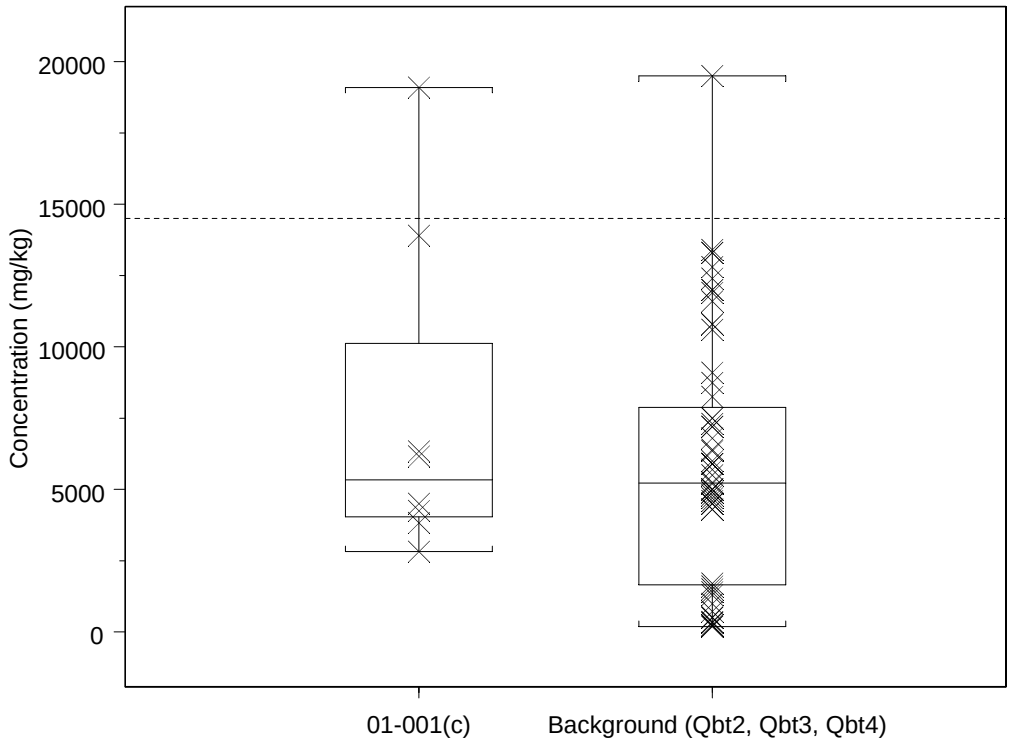


Figure F-3.3-9 Site concentrations of iron in tuff at SWMU 01-001(c) compared to background
(× = detect, ○ = nondetect)

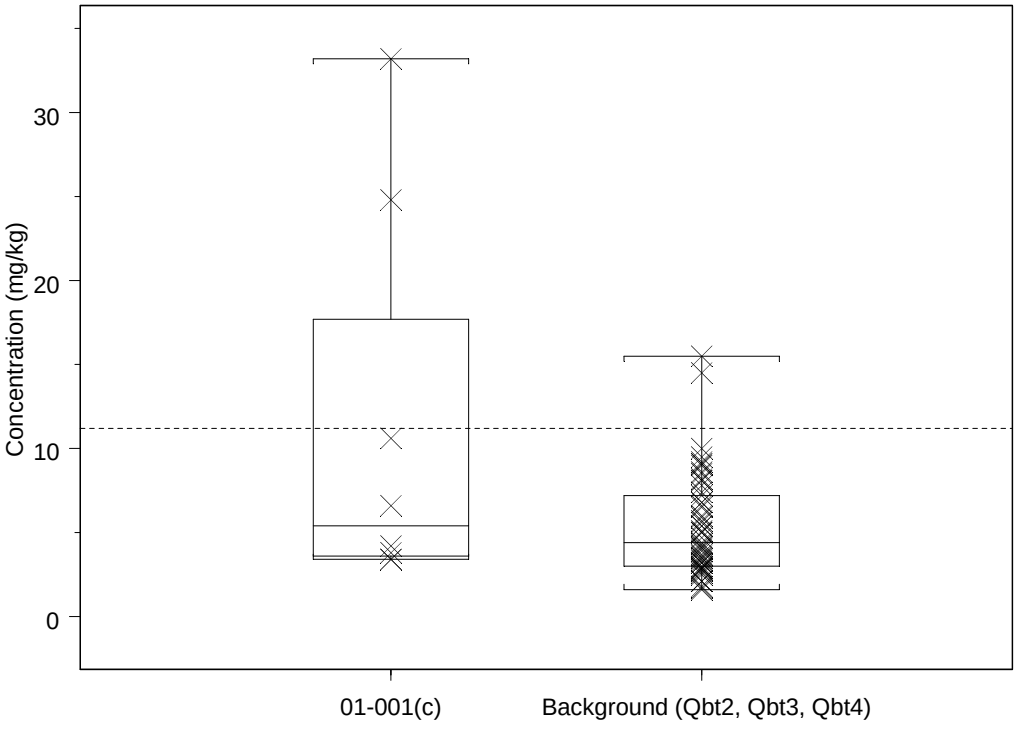


Figure F-3.3-10 Site concentrations of lead in tuff at SWMU 01-001(c) compared to background
(× = detect, ○ = nondetect)

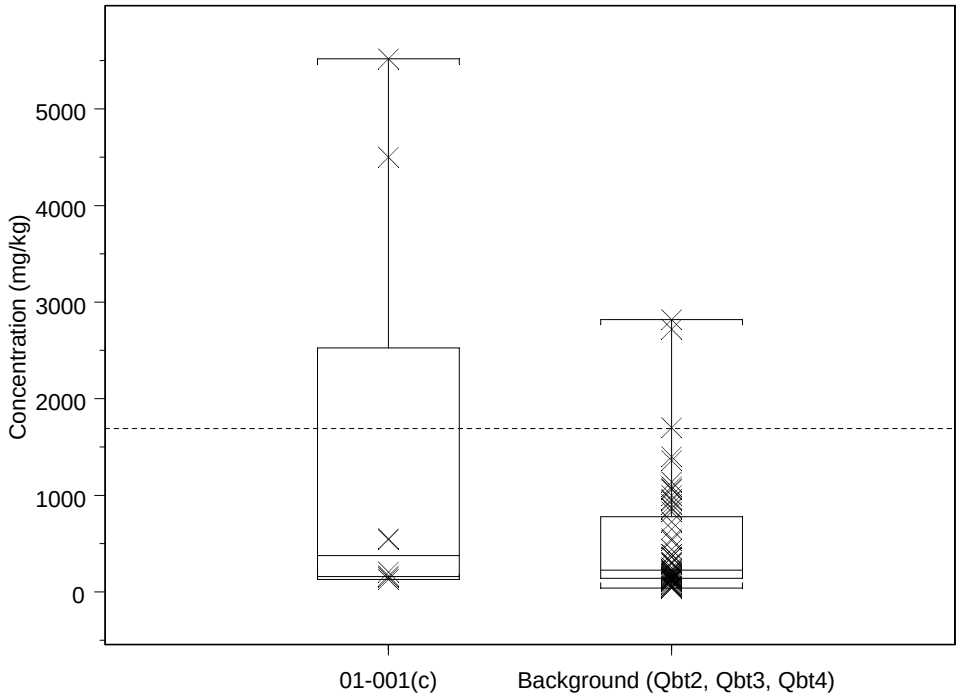


Figure F-3.3-11 Site concentrations of magnesium in tuff at SWMU 01-001(c) compared to background

(× = detect, ○ = nondetect)

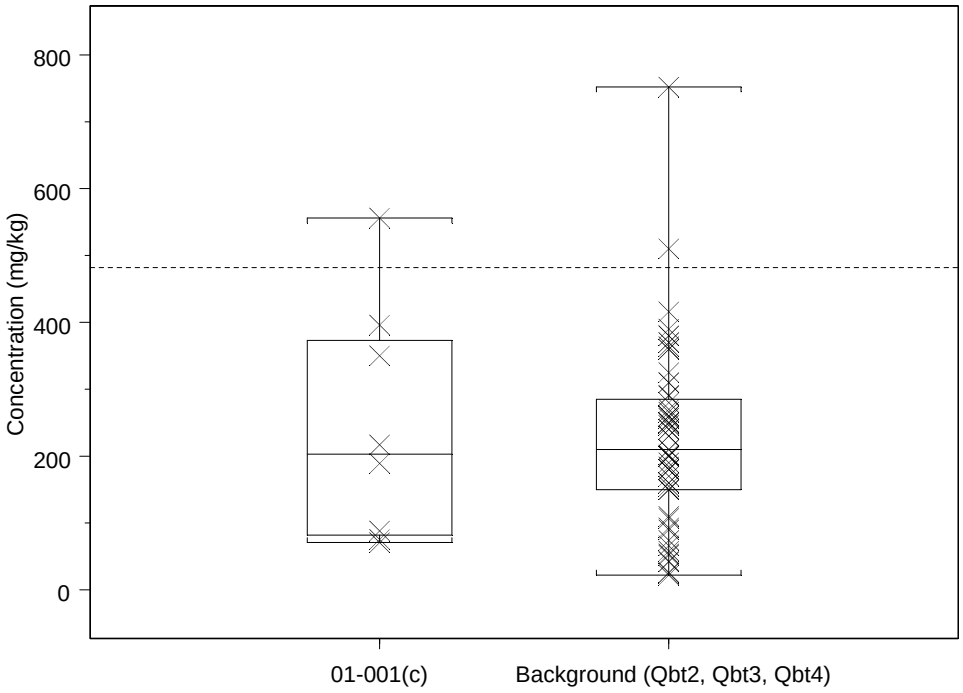


Figure F-3.3-12 Site concentrations of manganese in tuff at SWMU 01-001(c) compared to background

(× = detect, ○ = nondetect)

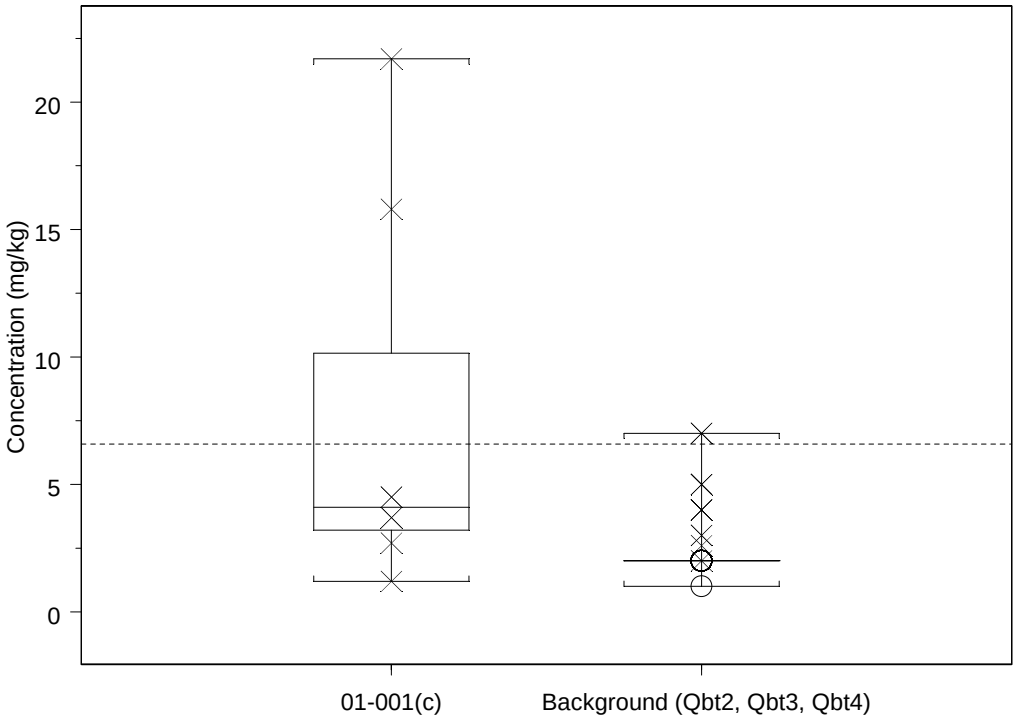


Figure F-3.3-13 Site concentrations of nickel in tuff at SWMU 01-001(c) compared to background
(× = detect, ○ = nondetect)

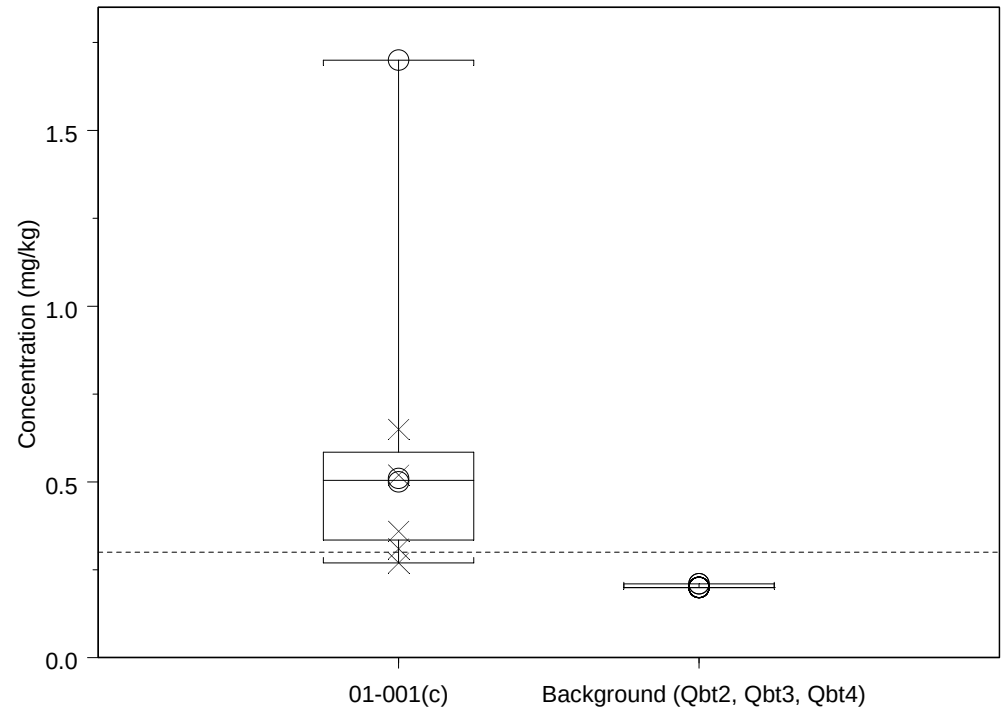


Figure F-3.3-14 Site concentrations of selenium in tuff at SWMU 01-001(c) compared to background
(× = detect, ○ = nondetect)

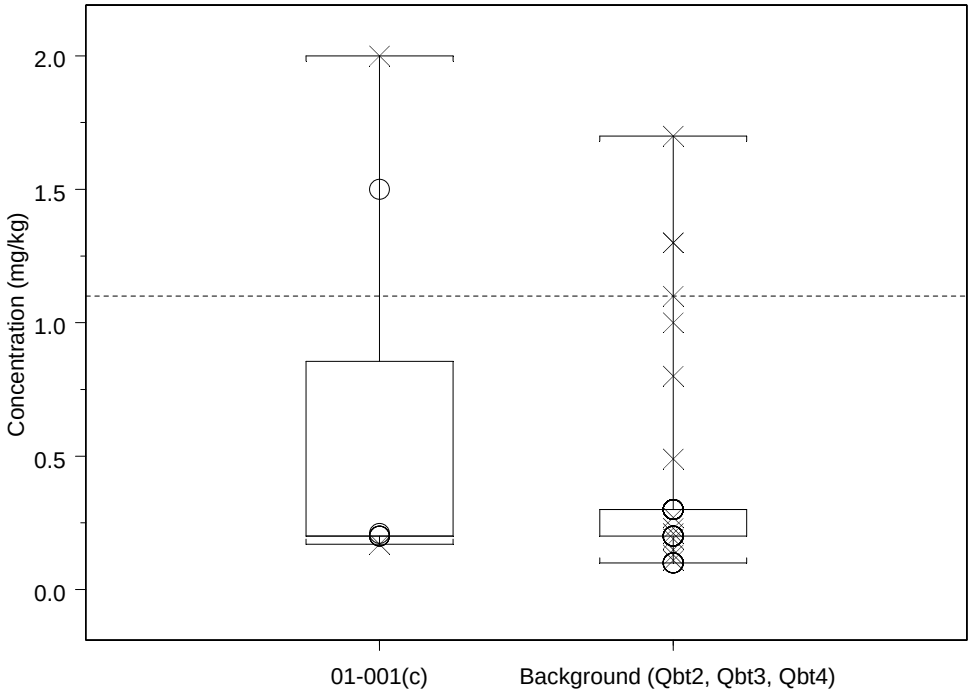


Figure F-3.3-15 Site concentrations of thallium in tuff at SWMU 01-001(c) compared to background

(× = detect, ○ = nondetect)

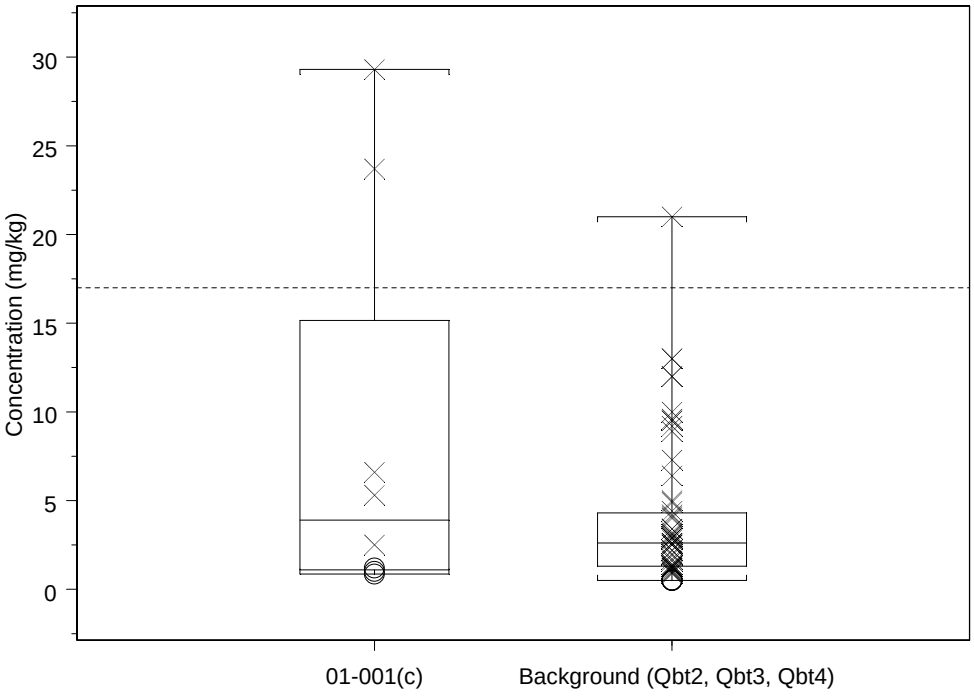


Figure F-3.3-16 Site concentrations of vanadium in tuff at SWMU 01-001(c) compared to background

(× = detect, ○ = nondetect)

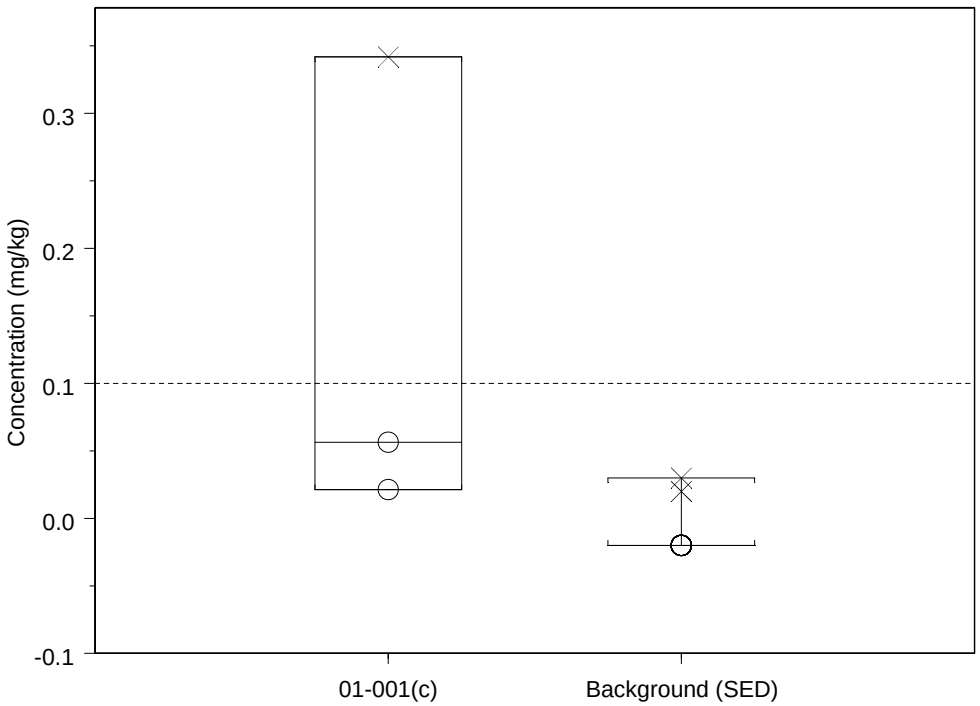


Figure F-3.3-17 Site concentrations of mercury in sediment at SWMU 01-001(c) compared to background

(× = detect, ○ = nondetect)

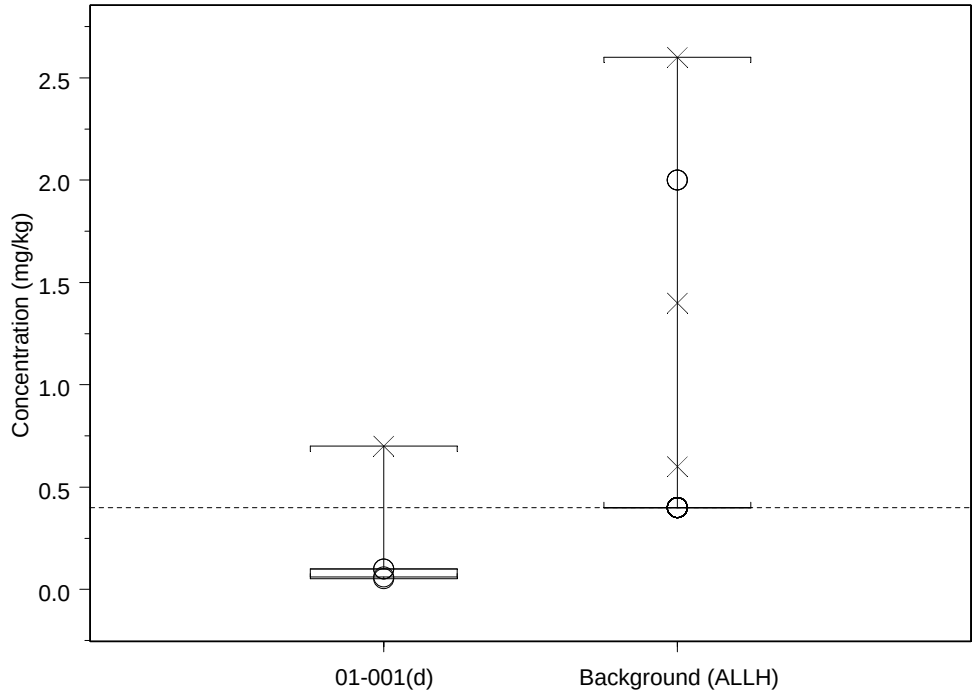


Figure F-3.4-1 Site concentrations of cadmium in soil at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

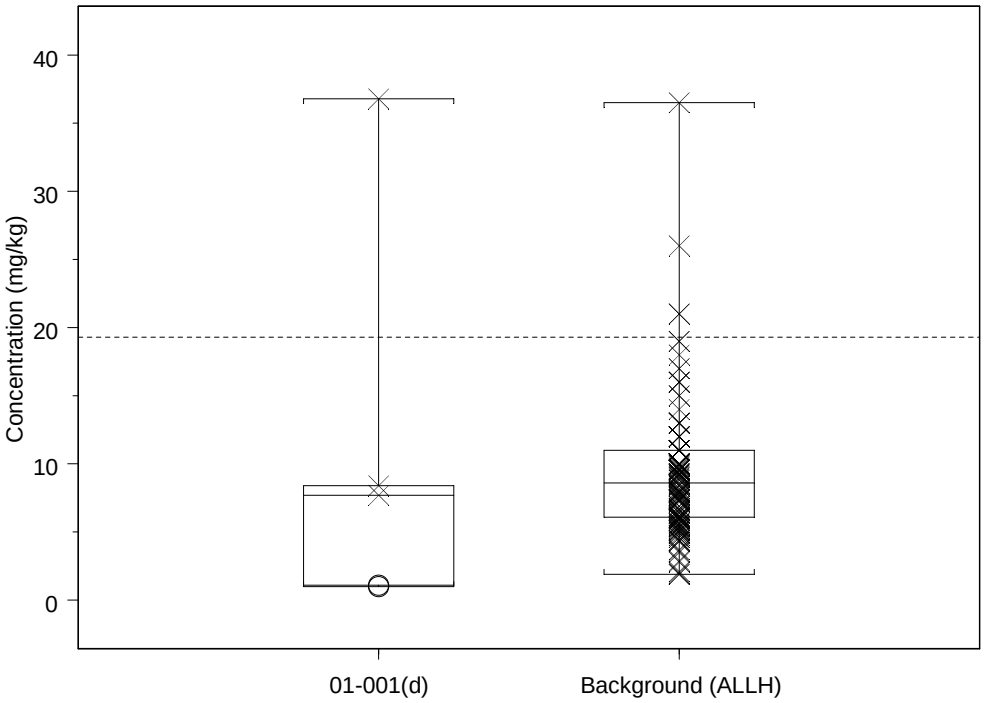


Figure F-3.4-2 Site concentrations of chromium in soil at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

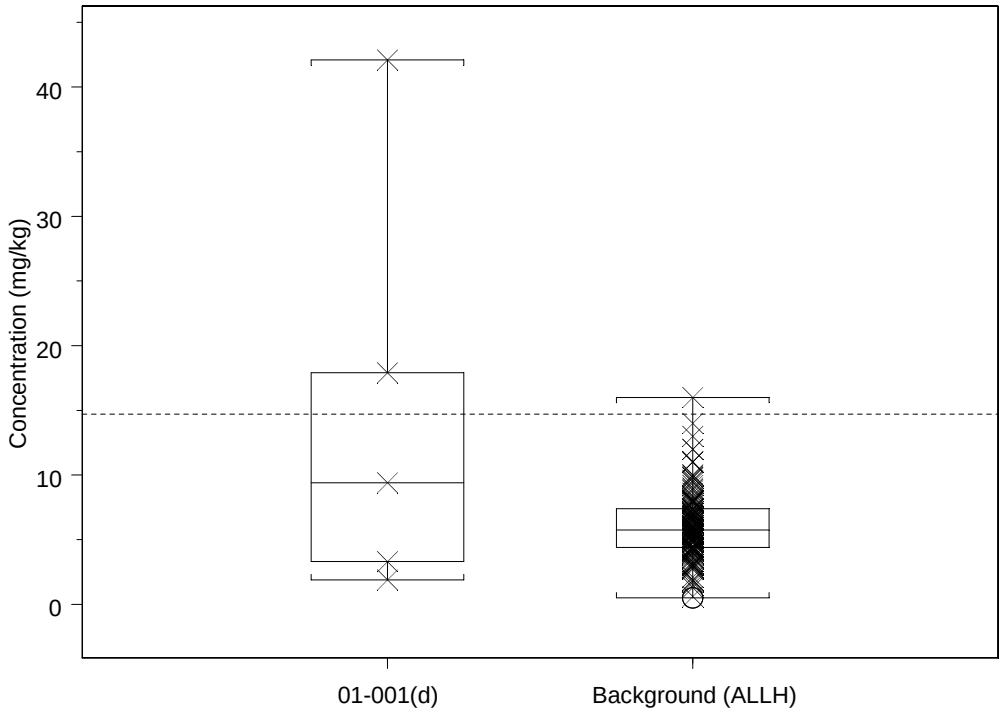


Figure F-3.4-3 Site concentrations of copper in soil at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

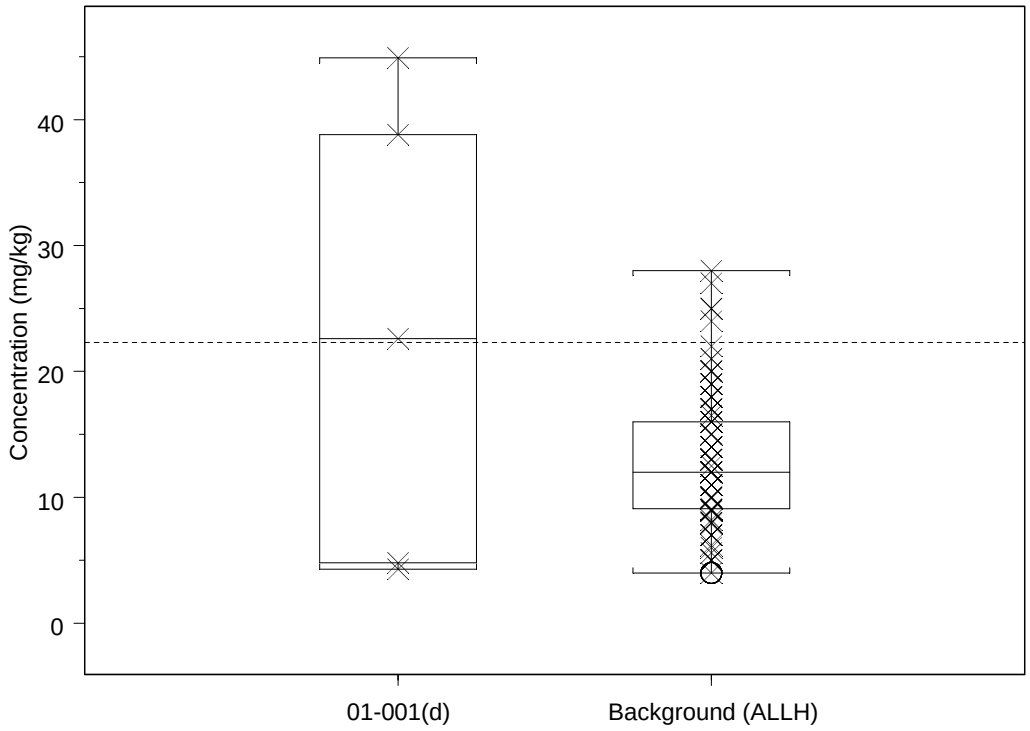


Figure F-3.4-4 Site concentrations of lead in soil at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

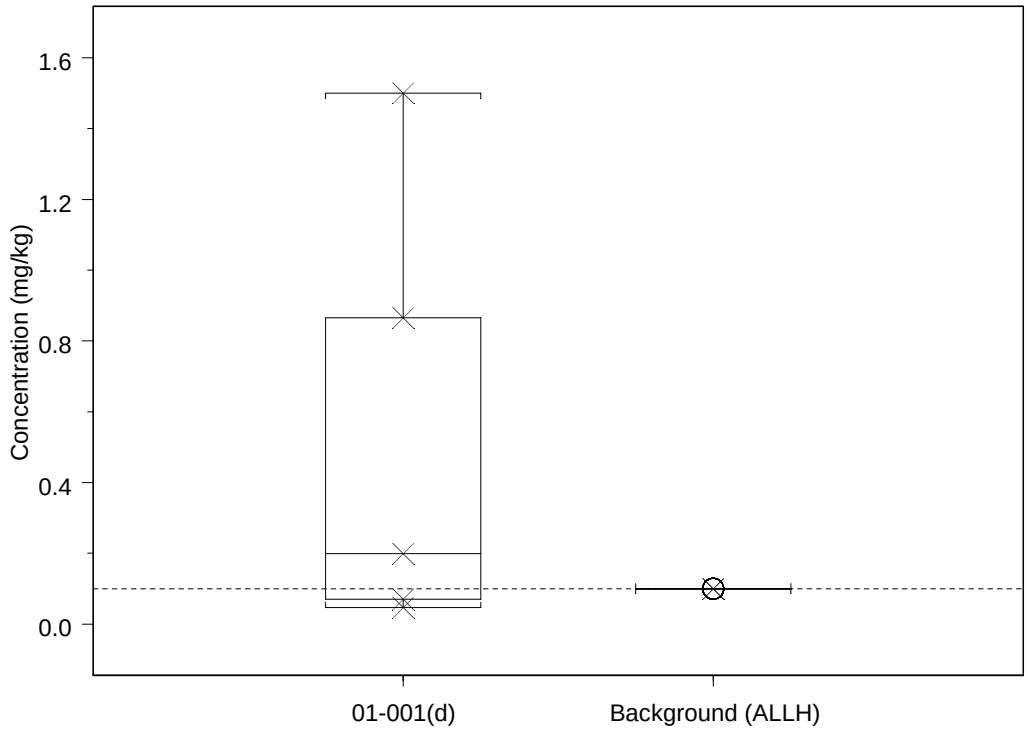


Figure F-3.4-5 Site concentrations of mercury in soil at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

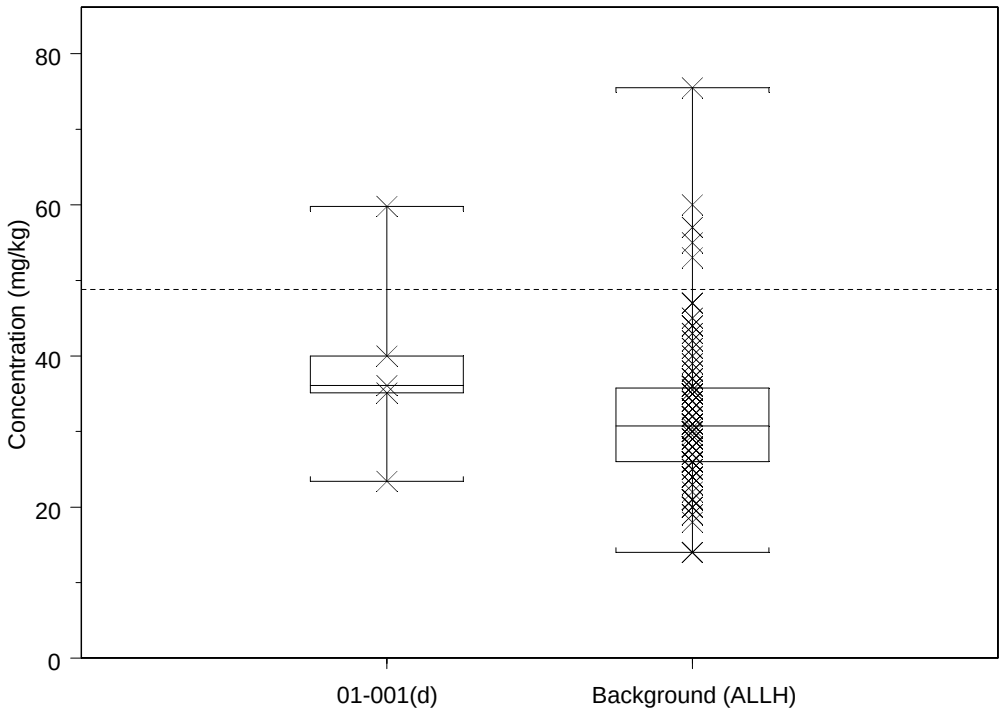


Figure F-3.4-6 Site concentrations of zinc in soil at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

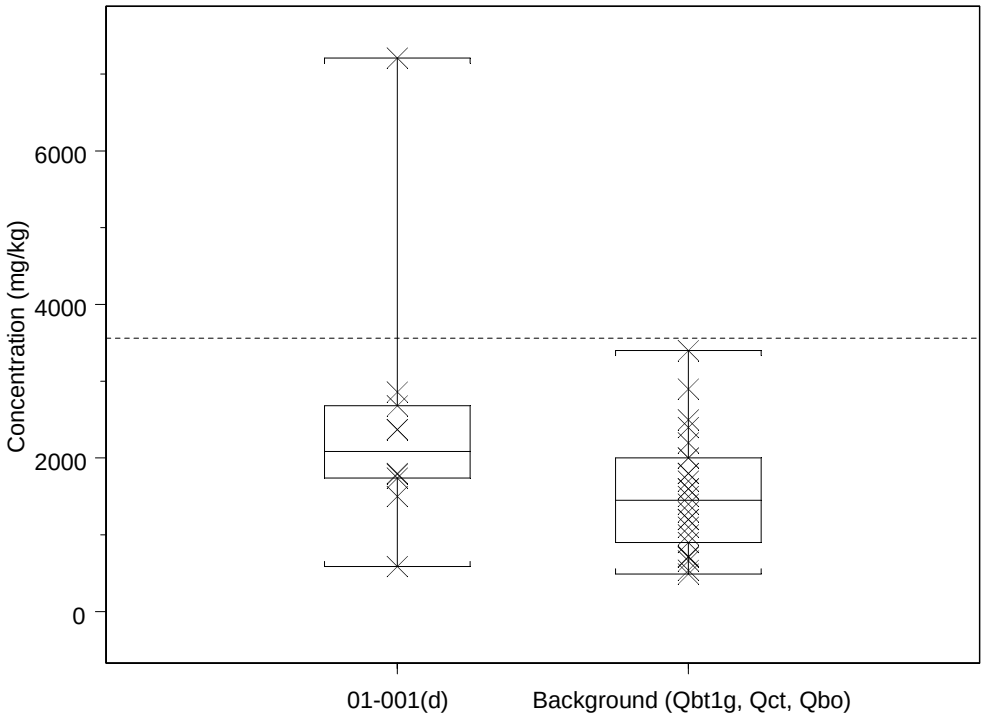


Figure F-3.4-7 Site concentrations of aluminum in Qbt1g at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

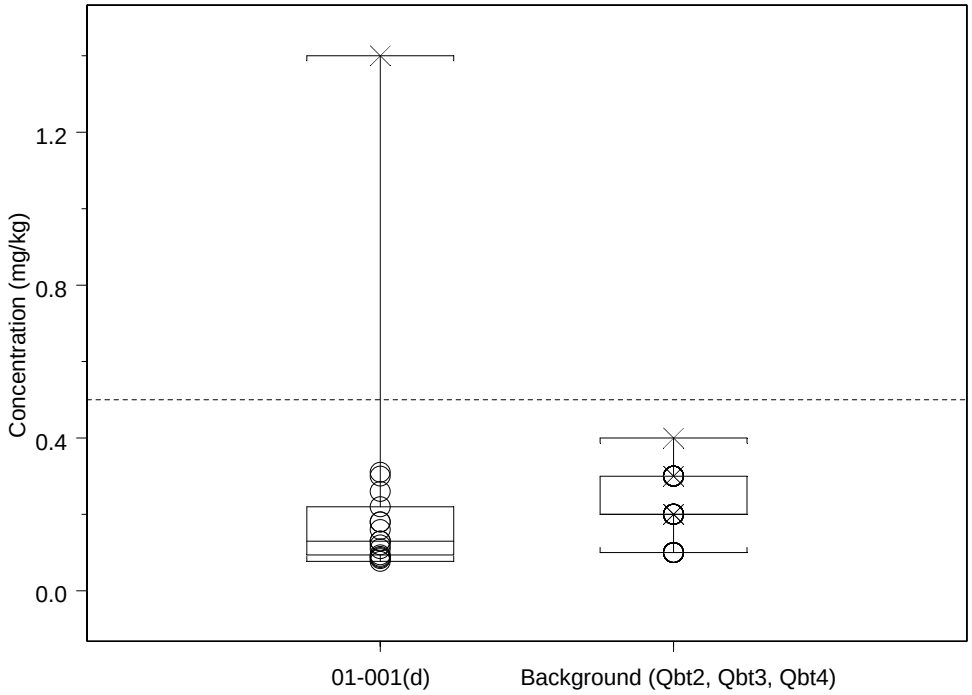


Figure F-3.4-8 Site concentrations of antimony in tuff at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

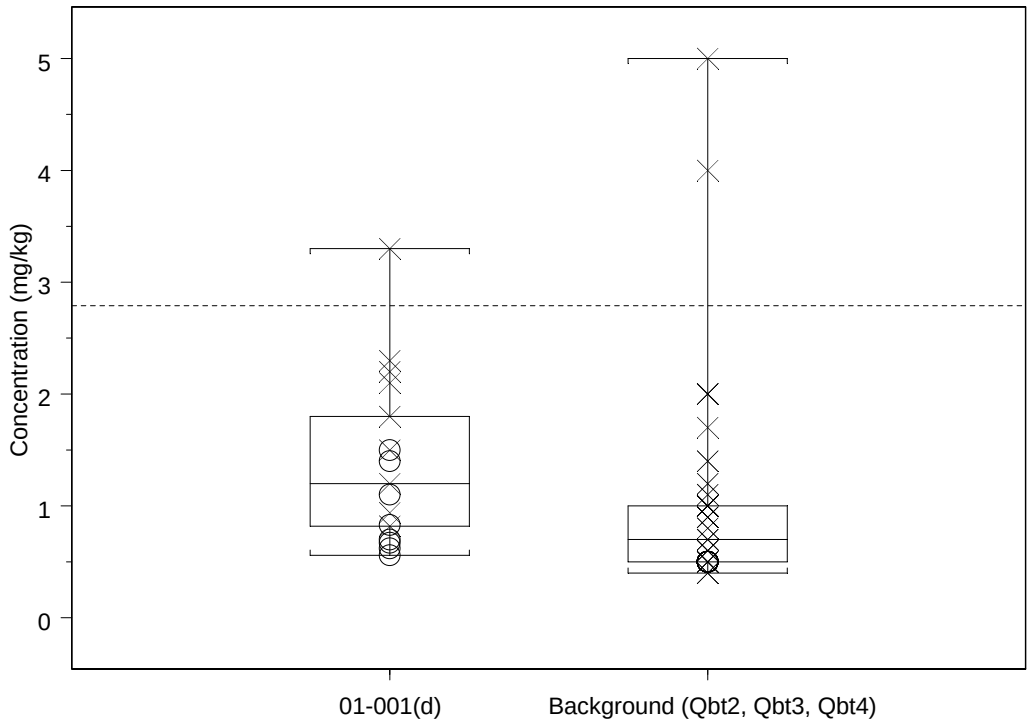


Figure F-3.4-9 Site concentrations of arsenic in tuff at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

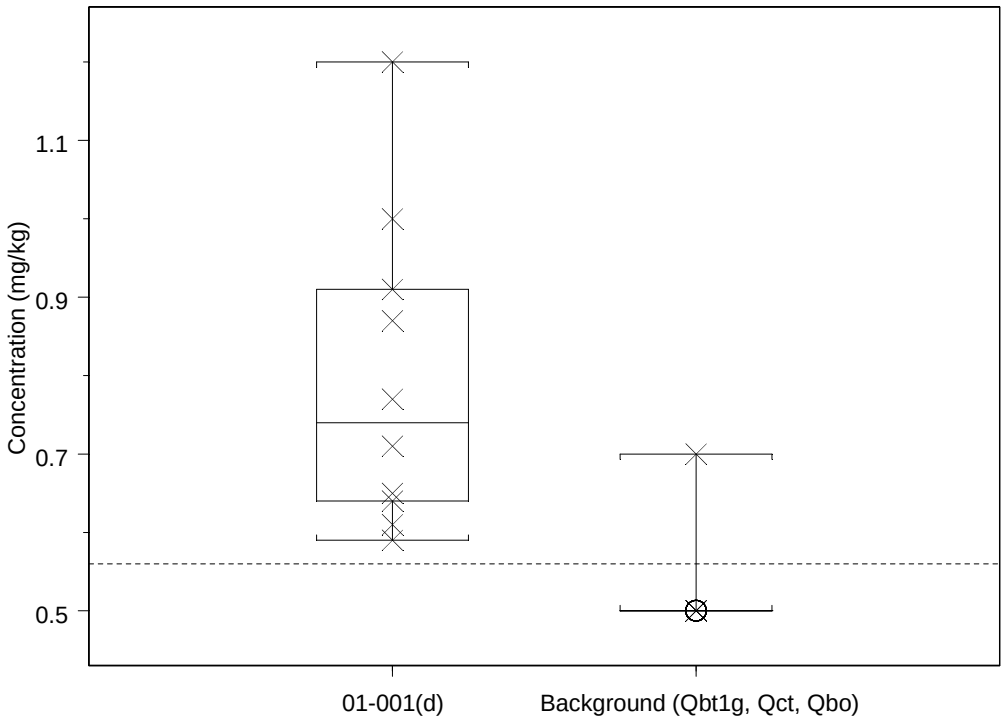


Figure F-3.4-10 Site concentrations of arsenic in Qbt1g at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

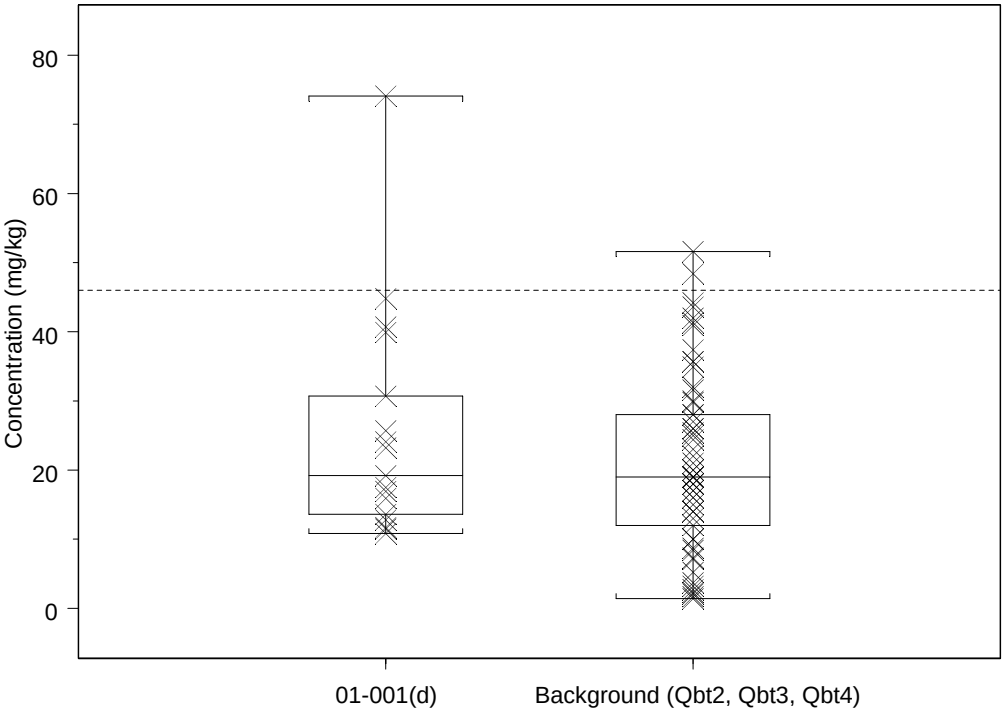


Figure F-3.4-11 Site concentrations of barium in tuff at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

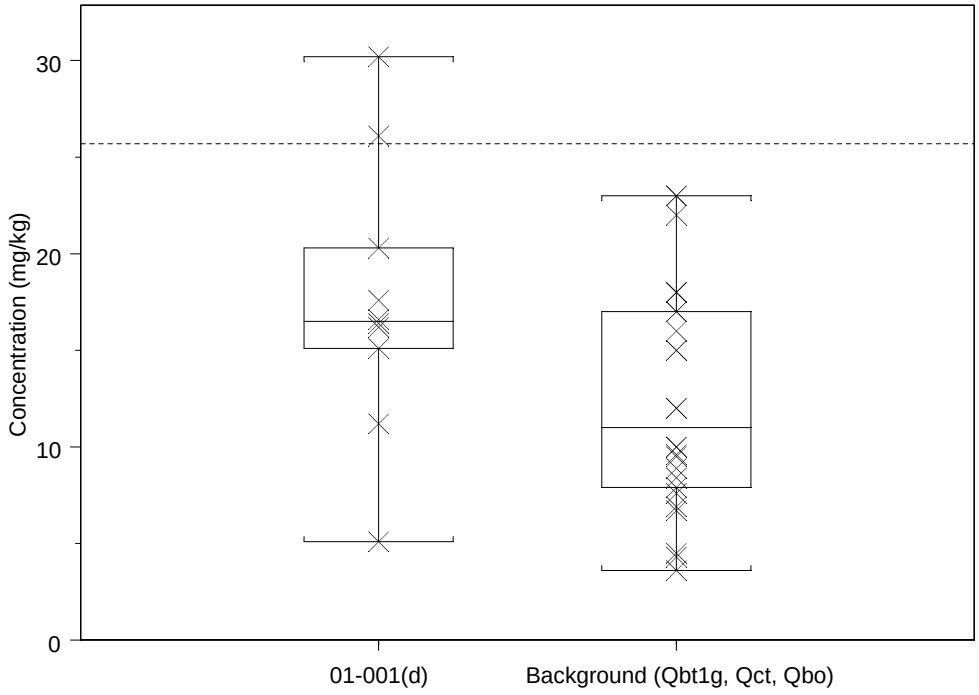


Figure F-3.4-12 Site concentrations of barium in Qbt1g at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

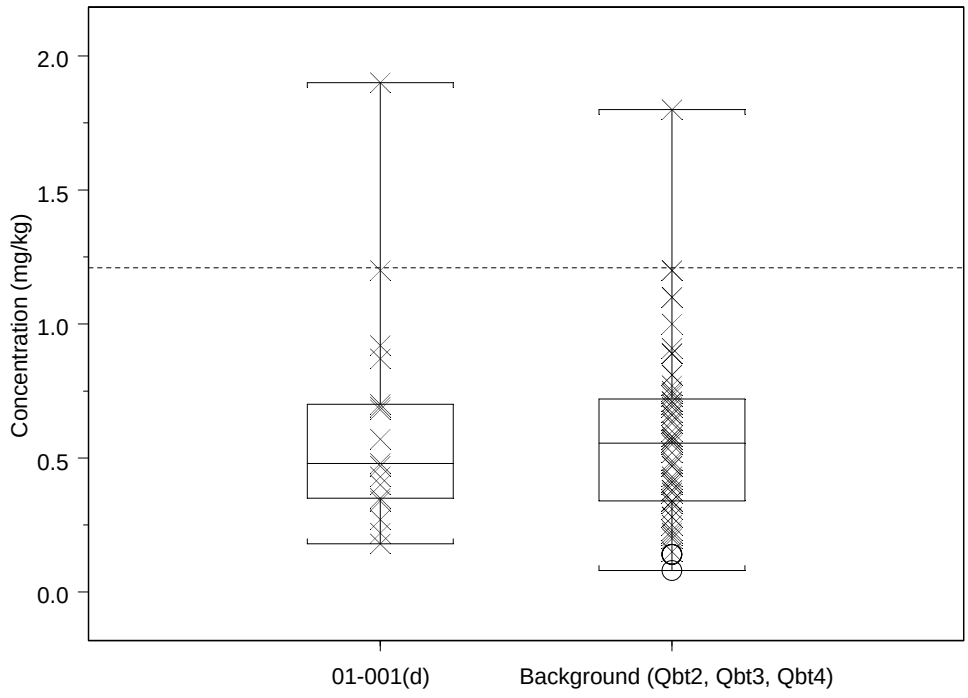


Figure F-3.4-13 Site concentrations of beryllium in tuff at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

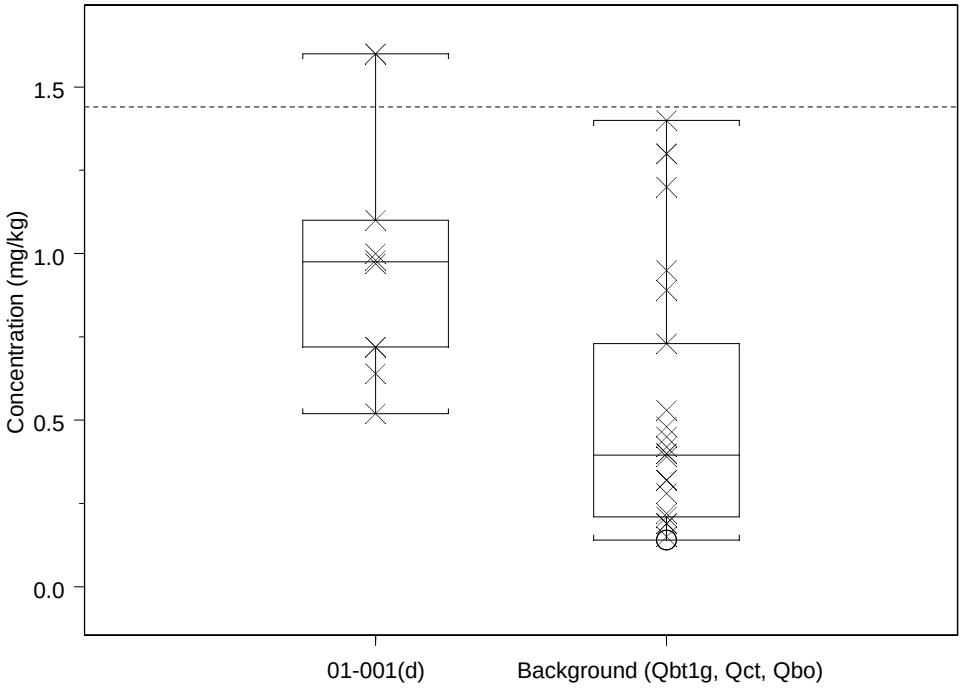


Figure F-3.4-14 Site concentrations of beryllium in Qbt1g at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

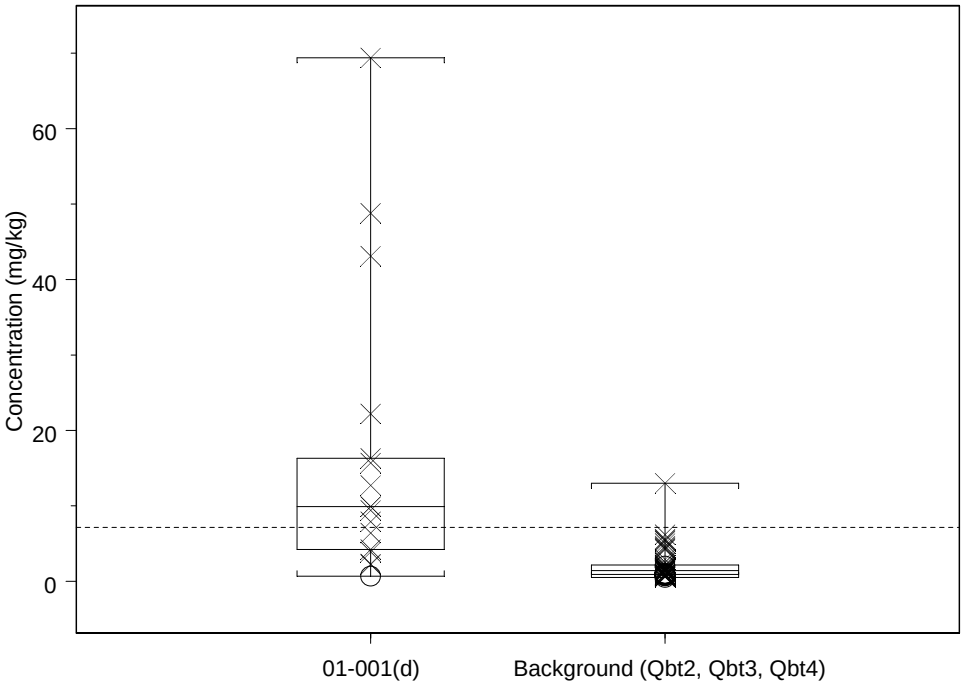


Figure F-3.4-15 Site concentrations of chromium in tuff at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

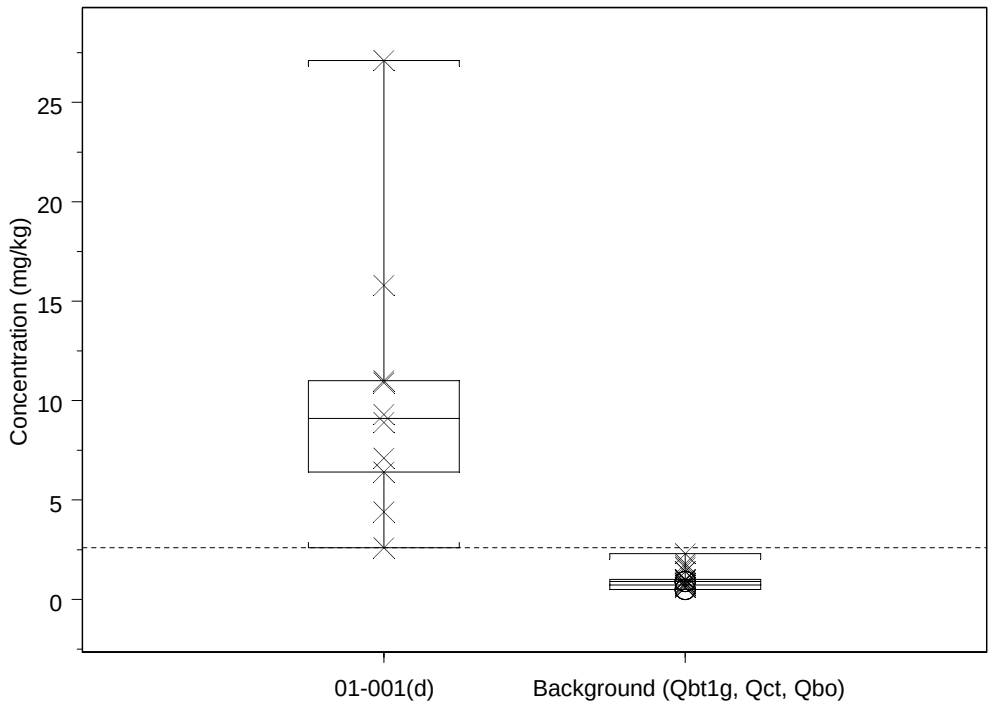


Figure F-3.4-16 Site concentrations of chromium in Qbt1g at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

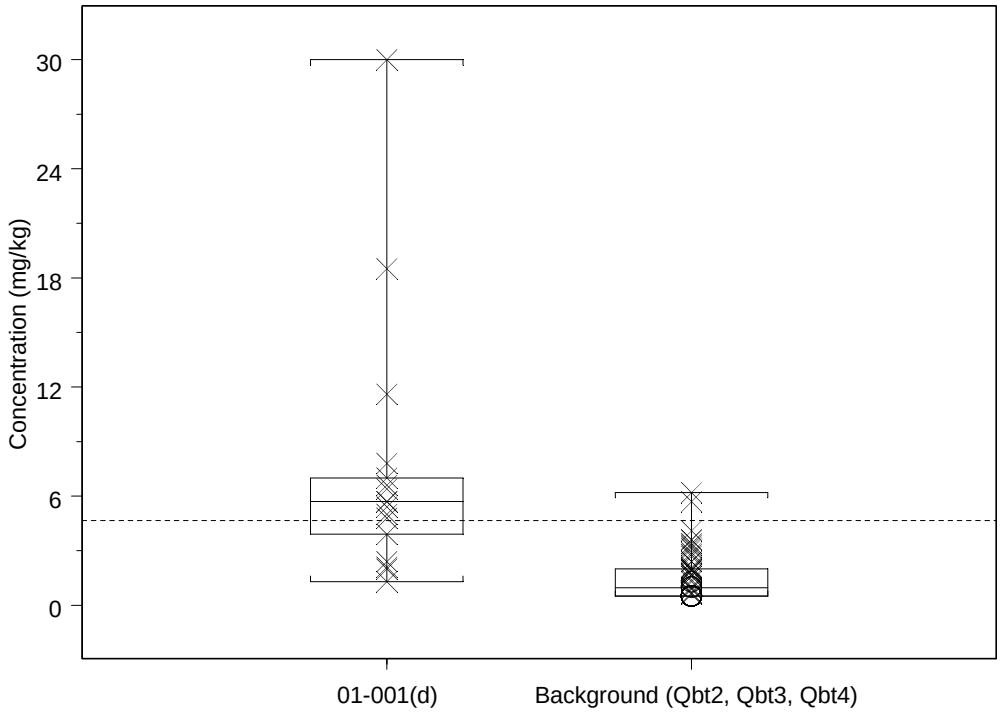


Figure F-3.4-17 Site concentrations of copper in tuff at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

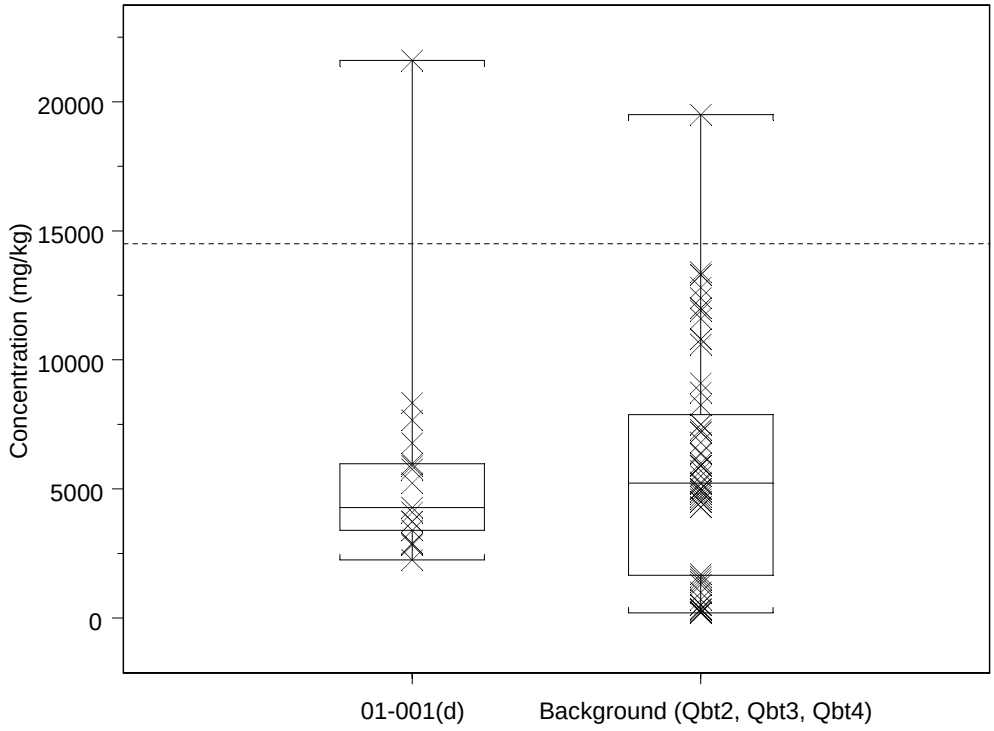


Figure F-3.4-18 Site concentrations of iron in tuff at SWMU 01-001(d) compared to background
(× = detect, ○ = nondetect)

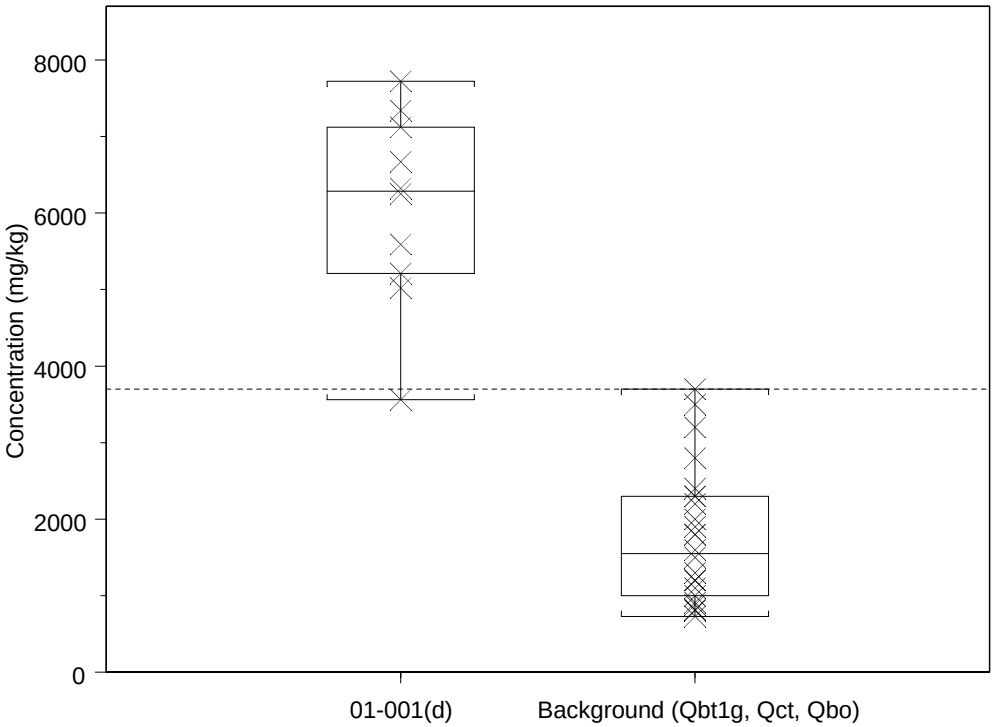


Figure F-3.4-19 Site concentrations of iron in Qbt1g at SWMU 01-001(d) compared to background
(× = detect, ○ = nondetect)

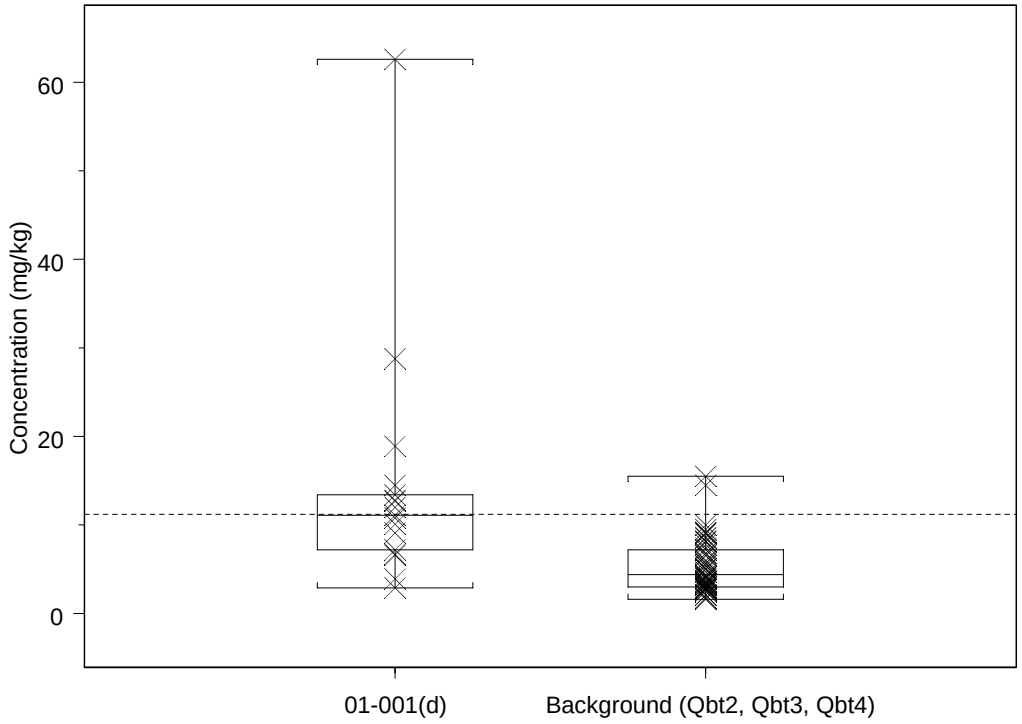


Figure F-3.4-20 Site concentrations of lead in tuff at SWMU 01-001(d) compared to background
(× = detect, ○ = nondetect)

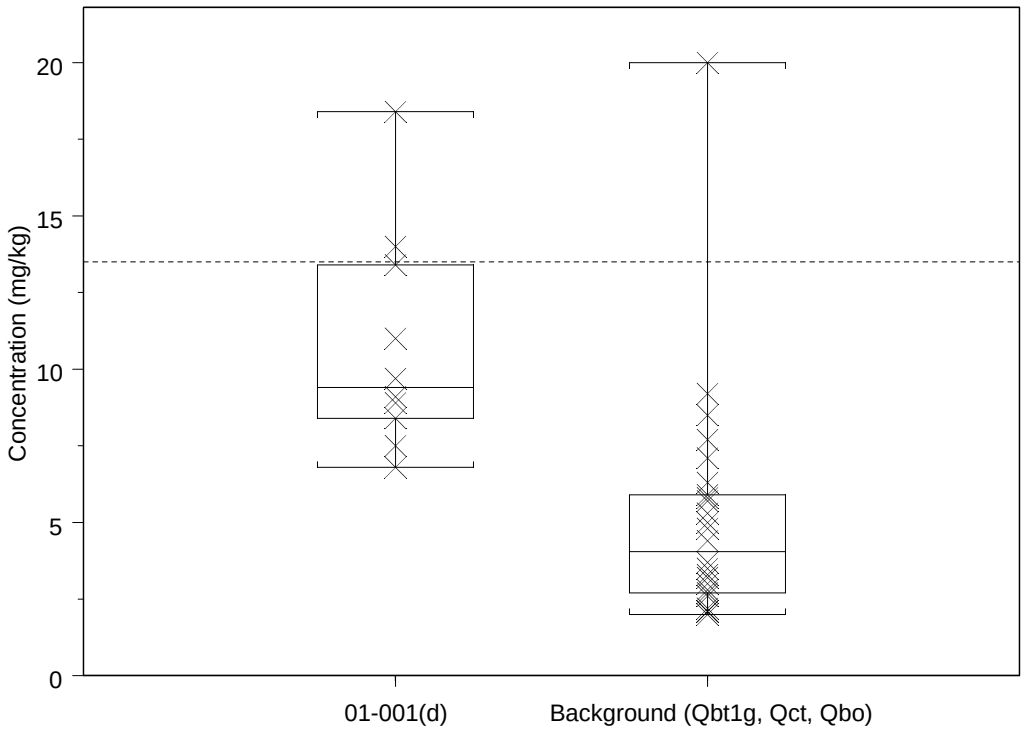


Figure F-3.4-21 Site concentrations of lead in Qbt1g at SWMU 01-001(d) compared to background
(× = detect, ○ = nondetect)

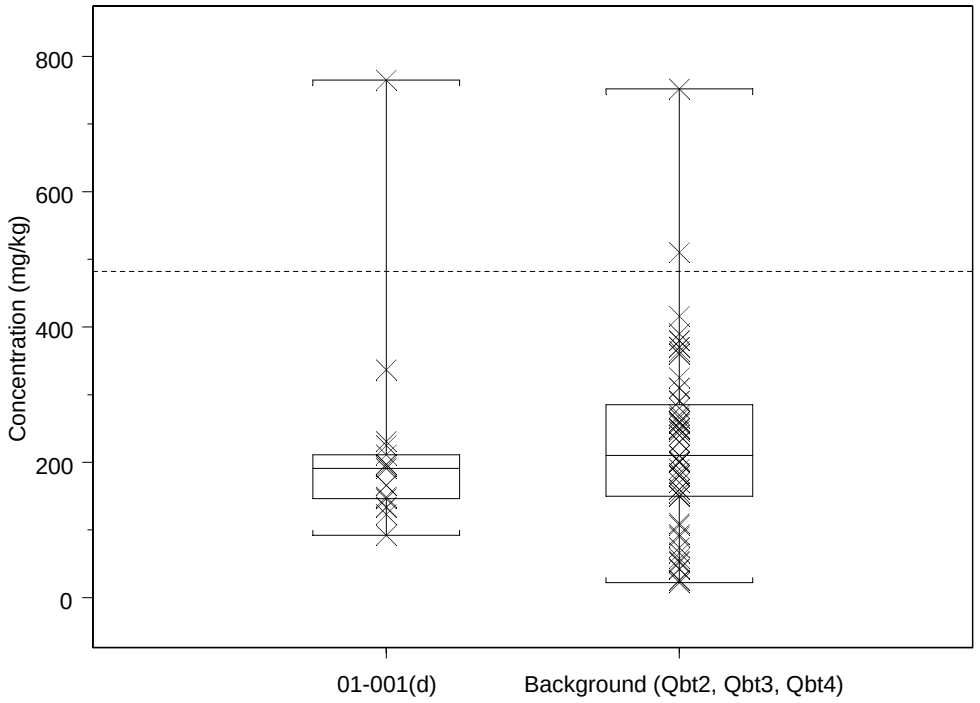


Figure F-3.4-22 Site concentrations of manganese in tuff at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

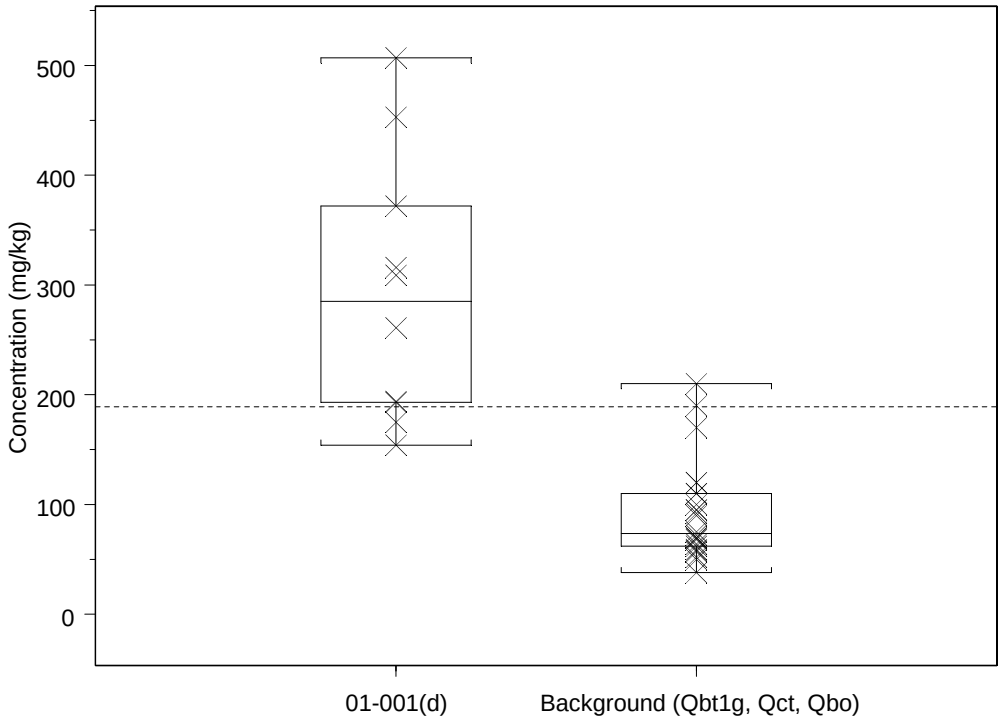


Figure F-3.4-23 Site concentrations of manganese in Qbt1g at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

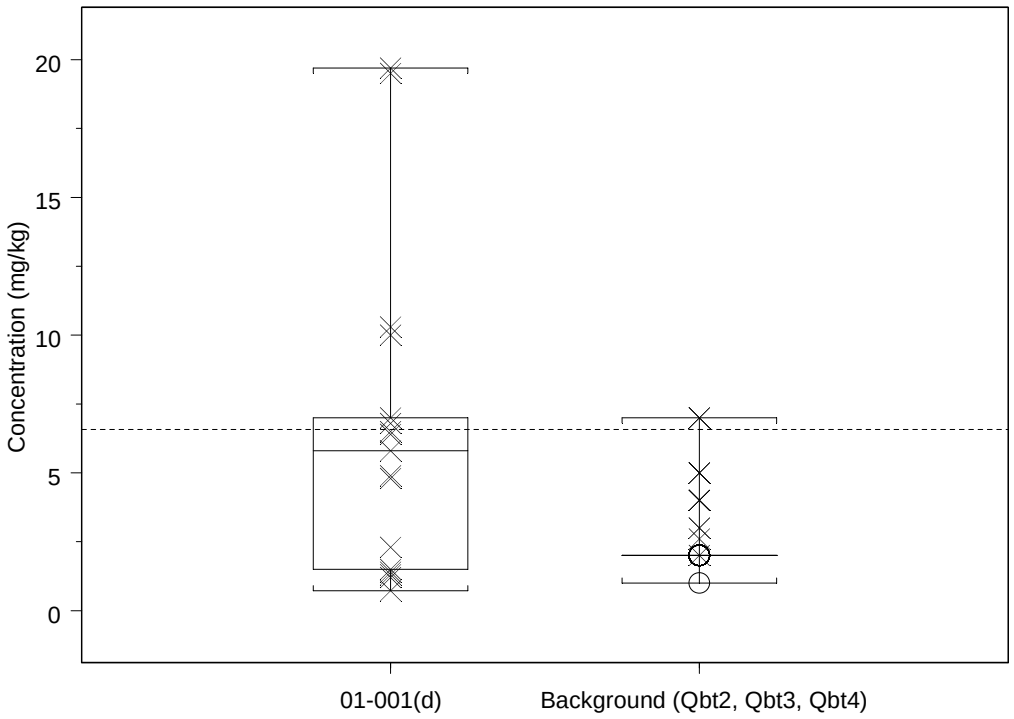


Figure F-3.4-24 Site concentrations of nickel in tuff at SWMU 01-001(d) compared to background
(× = detect, ○ = nondetect)

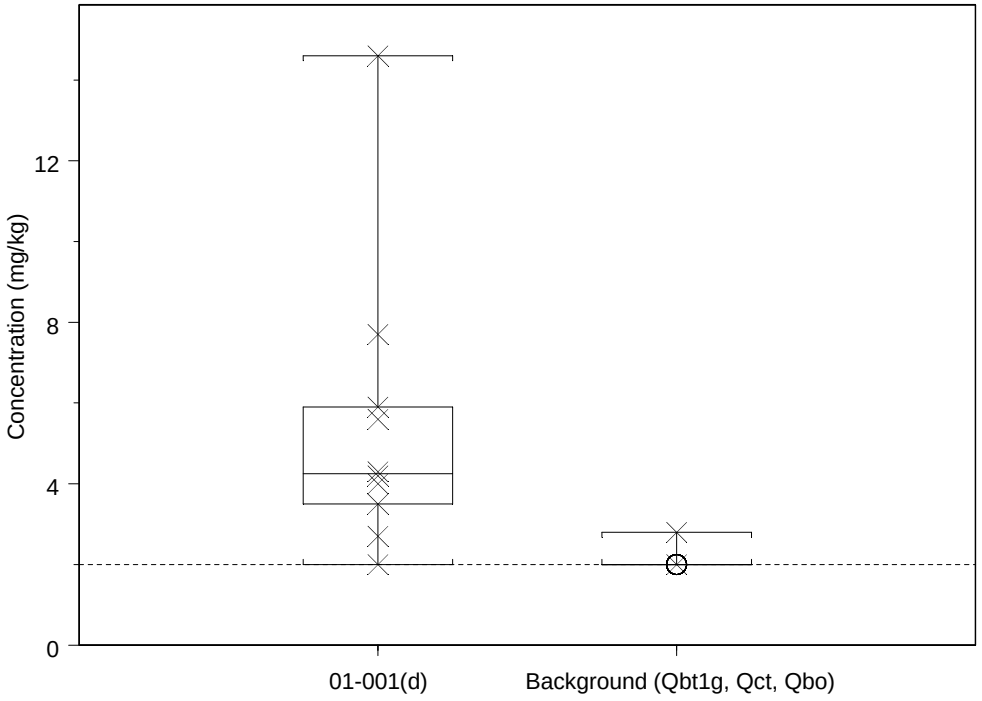


Figure F-3.4-25 Site concentrations of nickel in Qbt1g at SWMU 01-001(d) compared to background
(× = detect, ○ = nondetect)

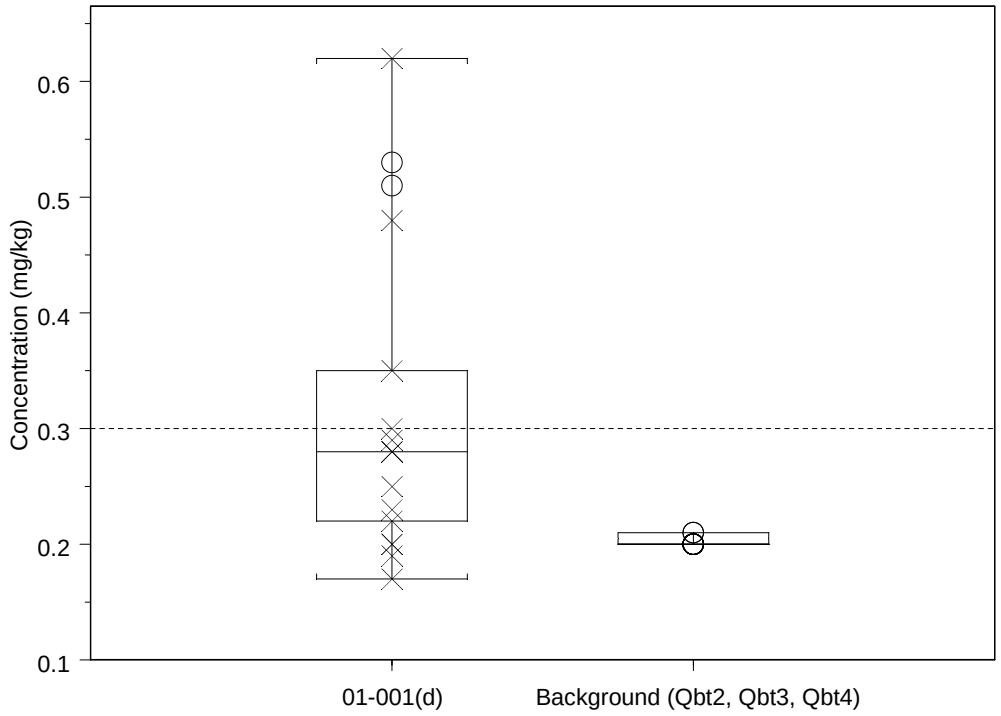


Figure F-3.4-26 Site concentrations of selenium in tuff at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

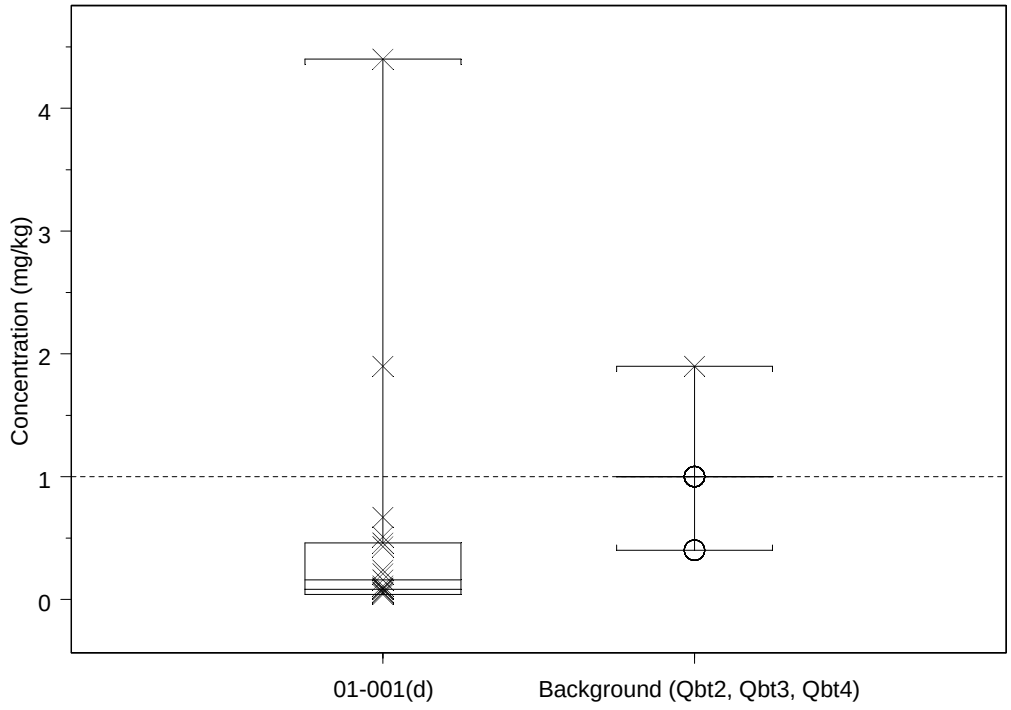


Figure F-3.4-27 Site concentrations of silver in tuff at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

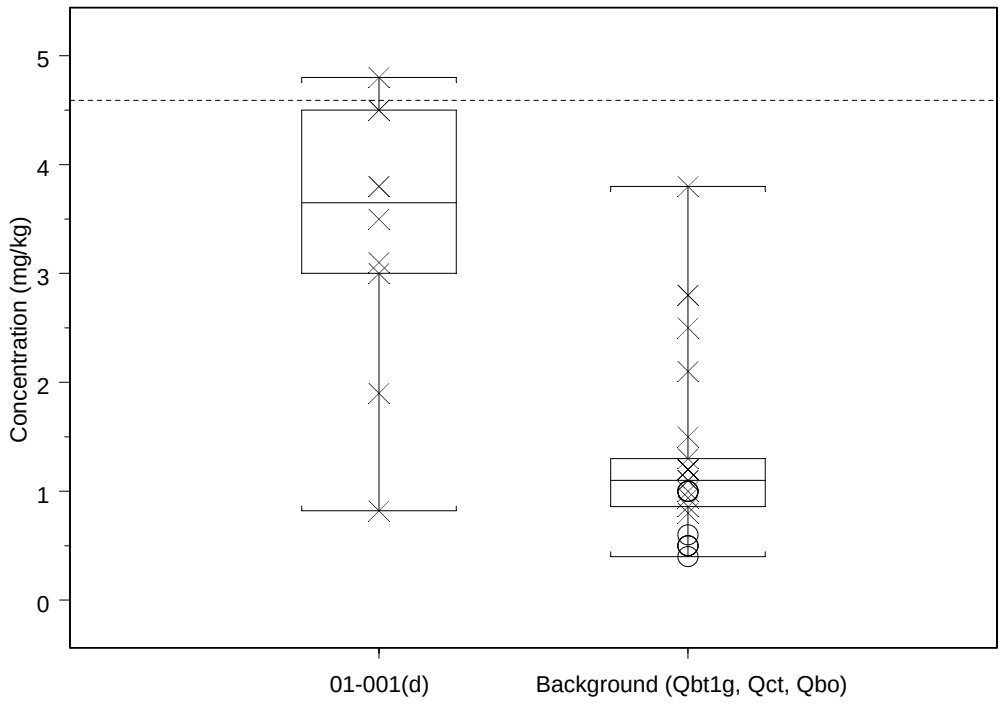


Figure F-3.4-28 Site concentrations of vanadium in tuff at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

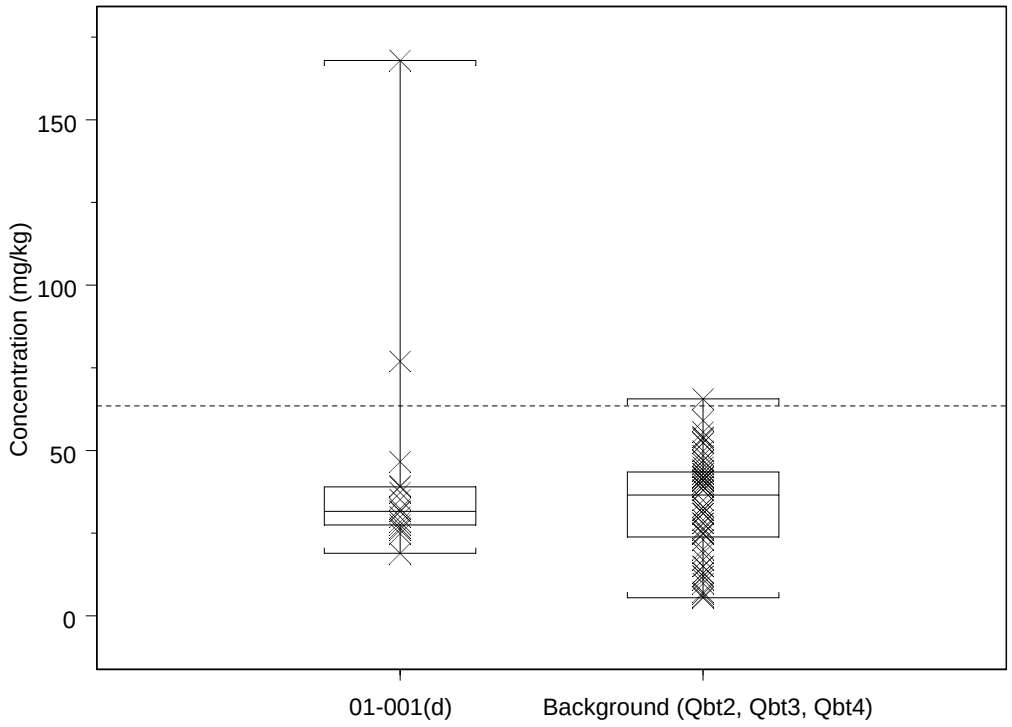


Figure F-3.4-29 Site concentrations of zinc in tuff at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

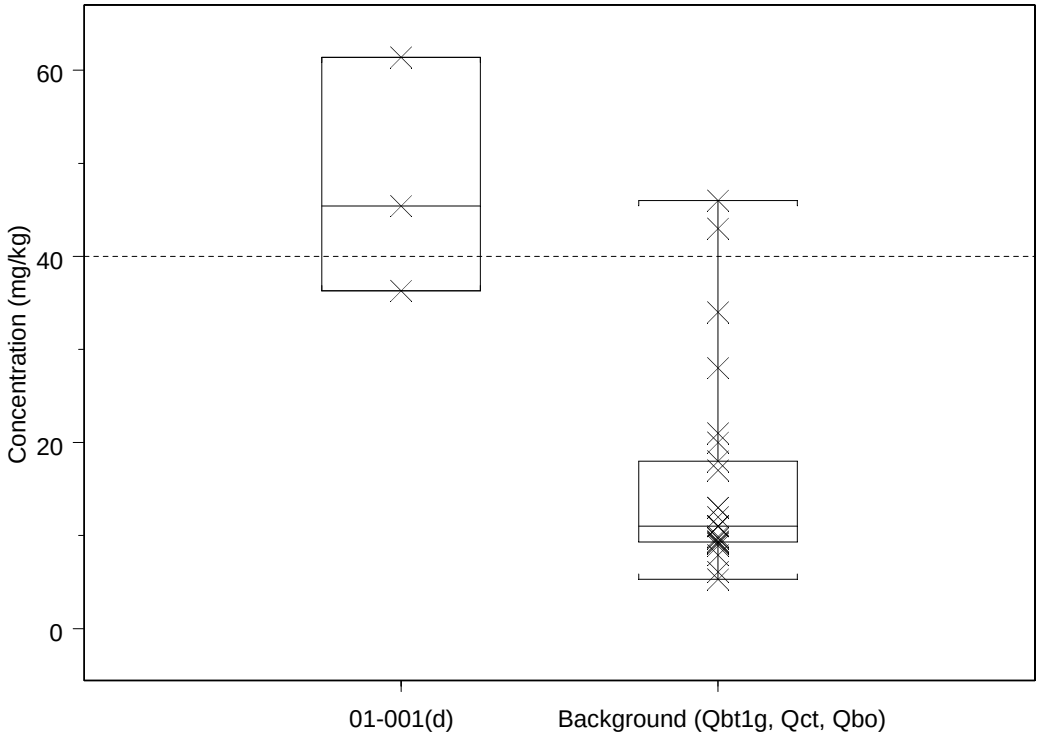


Figure F-3.4-30 Site concentrations of zinc in Qbt1g at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

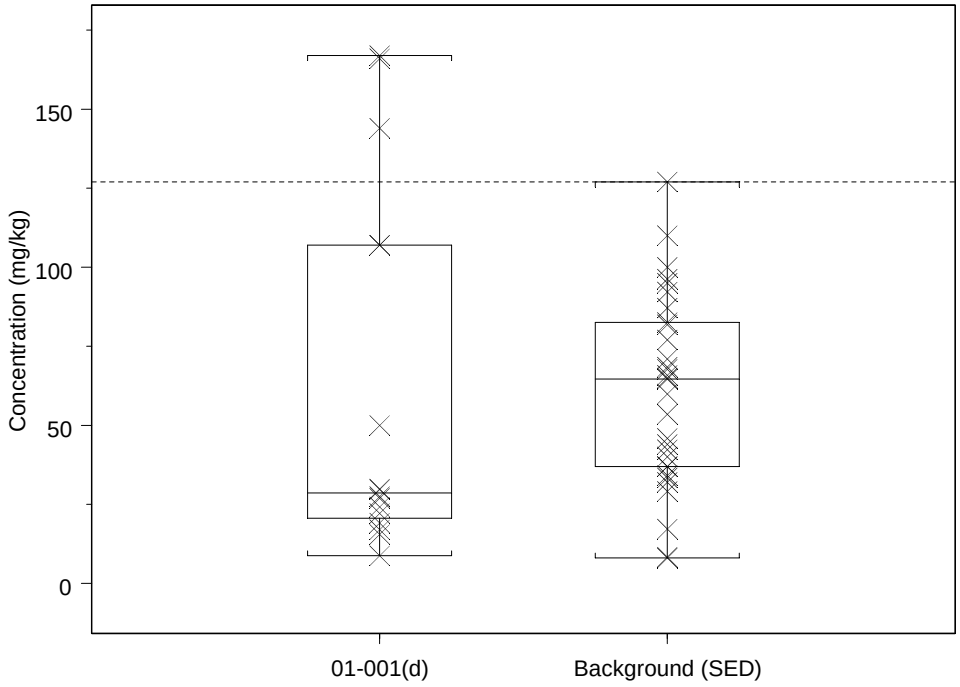


Figure F-3.4-31 Site concentrations of barium in sediment at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

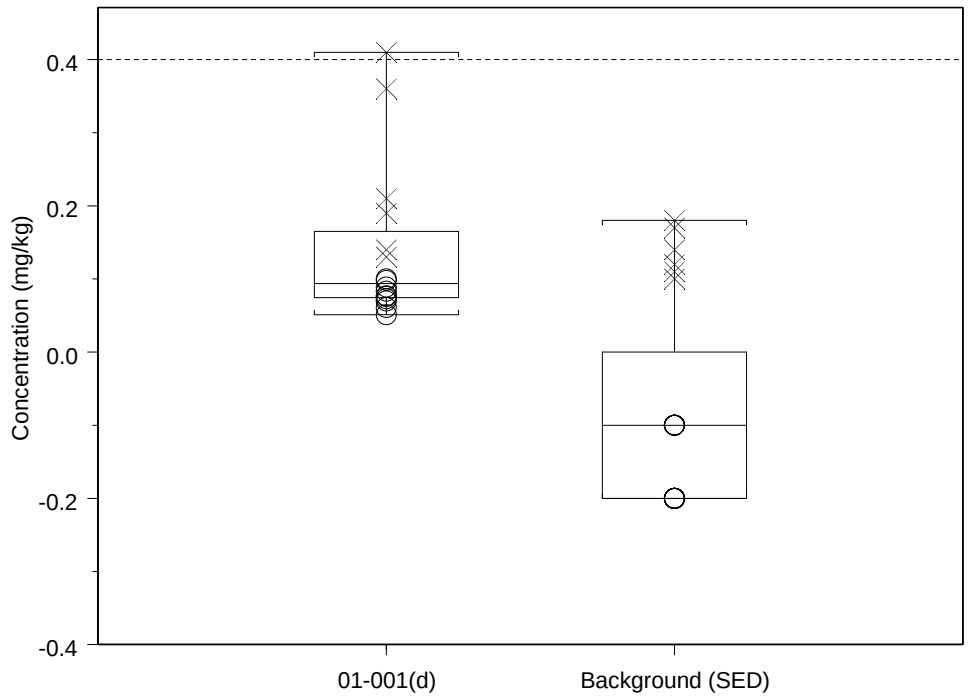


Figure F-3.4-32 Site concentrations of cadmium in sediment at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

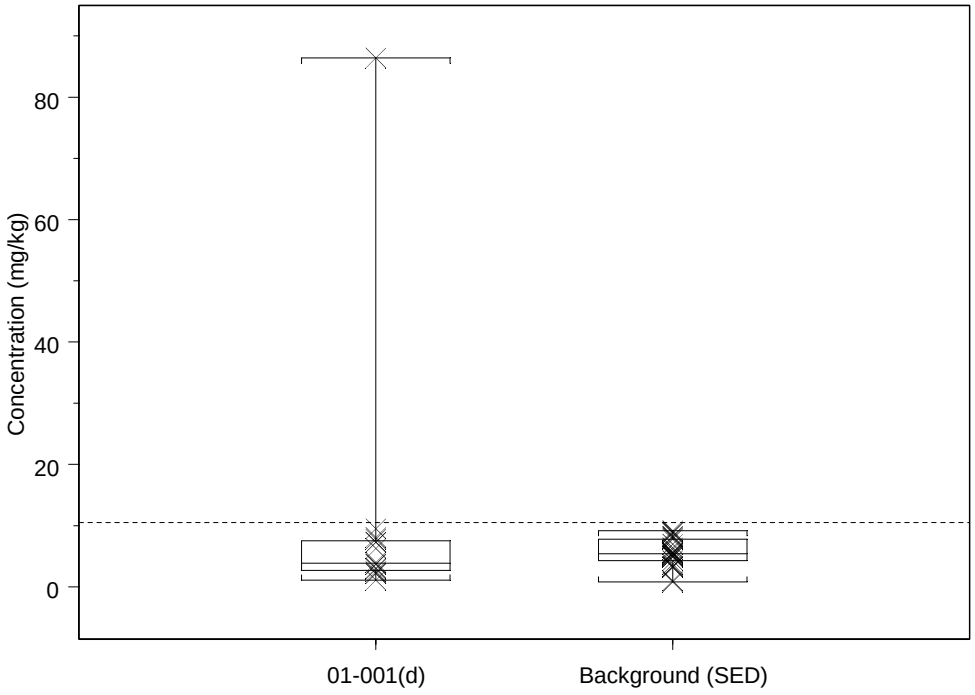


Figure F-3.4-33 Site concentrations of chromium in sediment at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

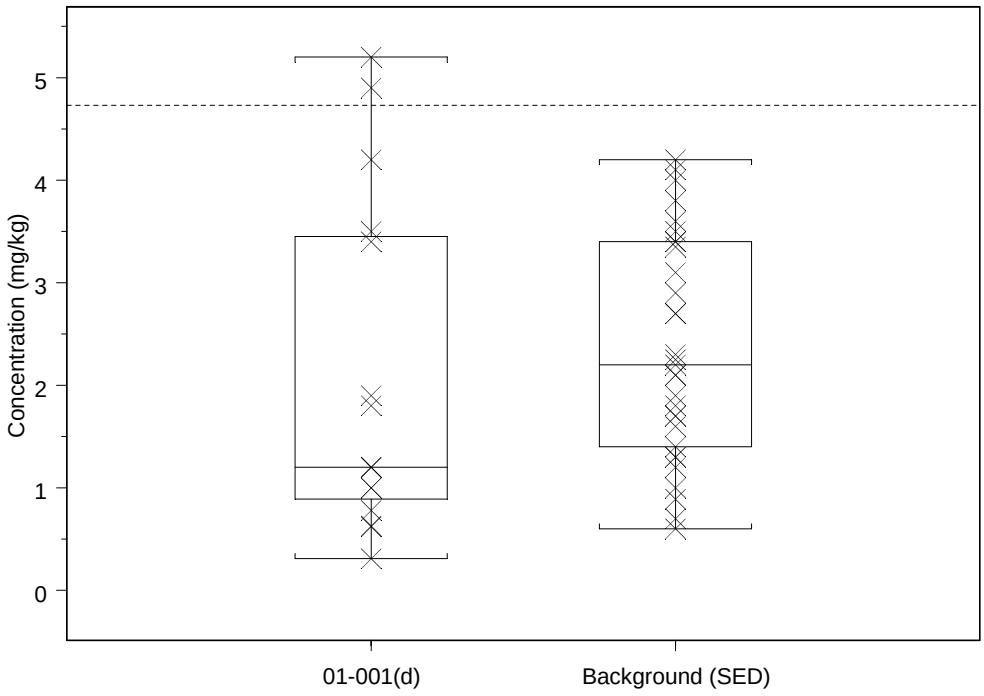


Figure F-3.4-34 Site concentrations of cobalt in sediment at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

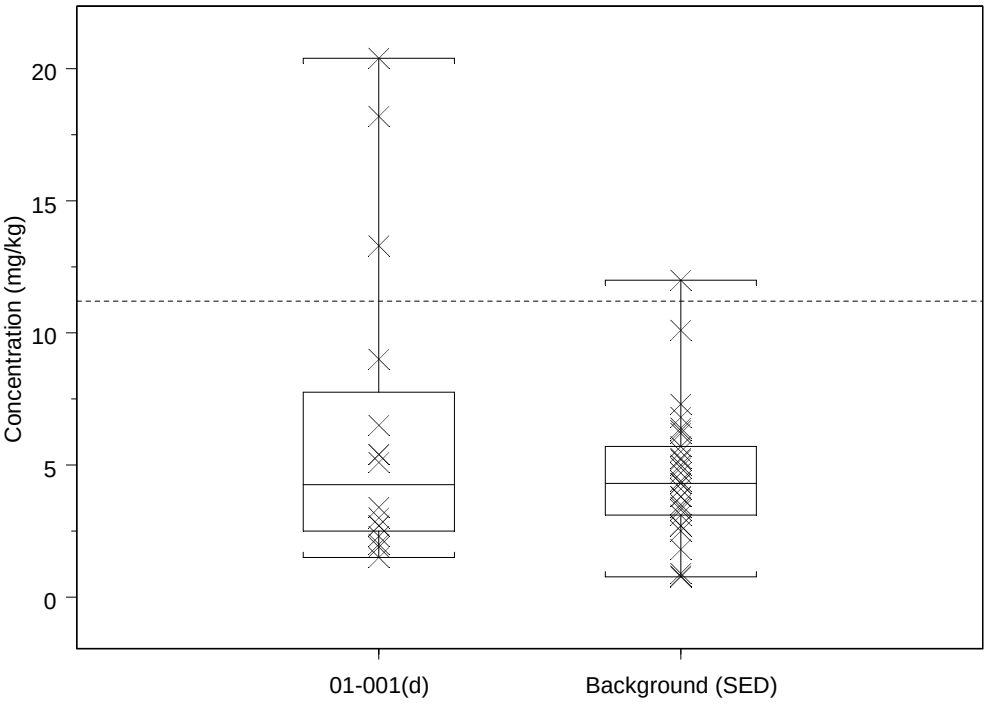


Figure F-3.4-35 Site concentrations of copper in sediment at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

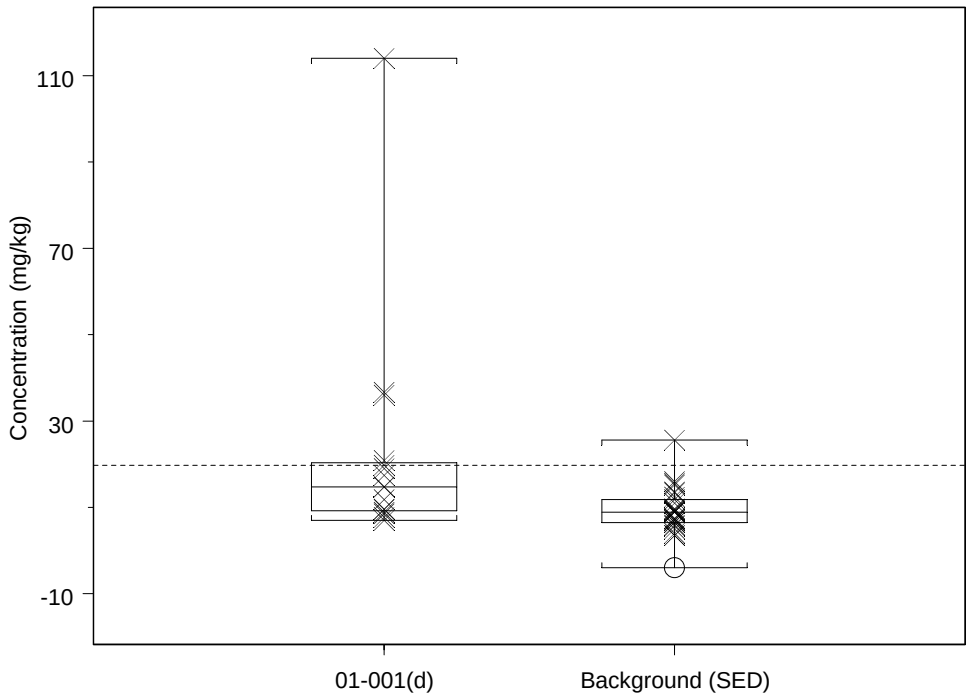


Figure F-3.4-36 Site concentrations of lead in sediment at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

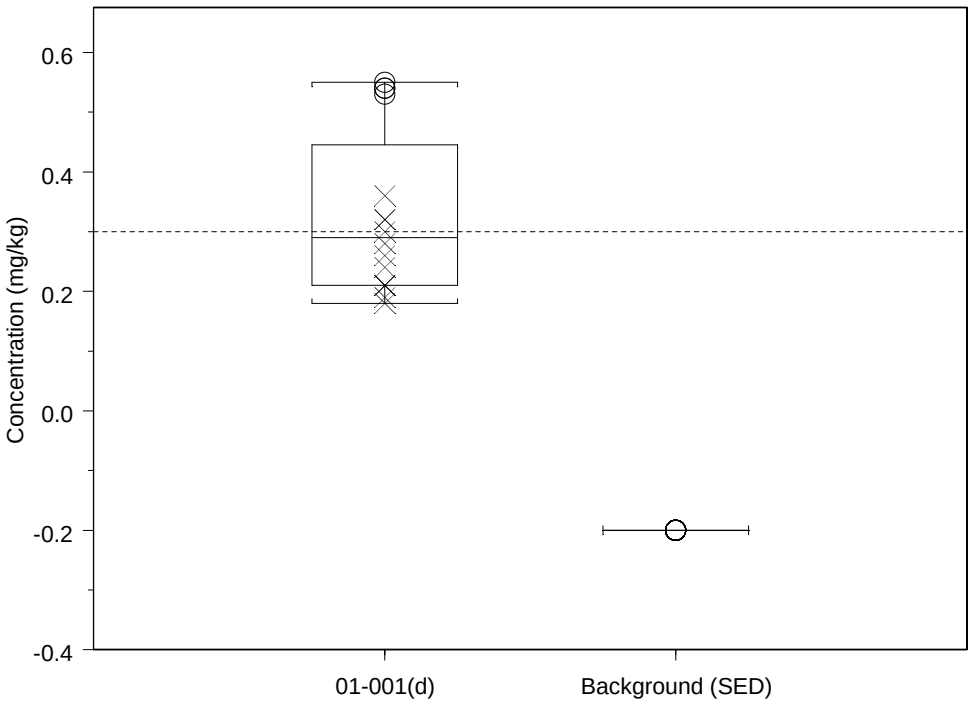


Figure F-3.4-37 Site concentrations of selenium in sediment at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

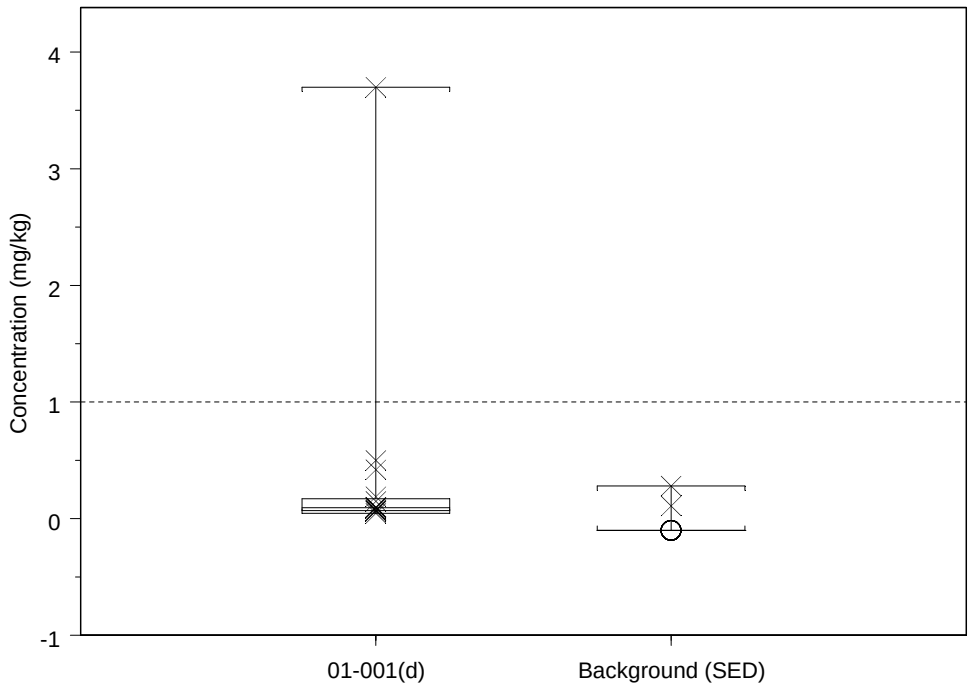


Figure F-3.4-38 Site concentrations of silver in sediment at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

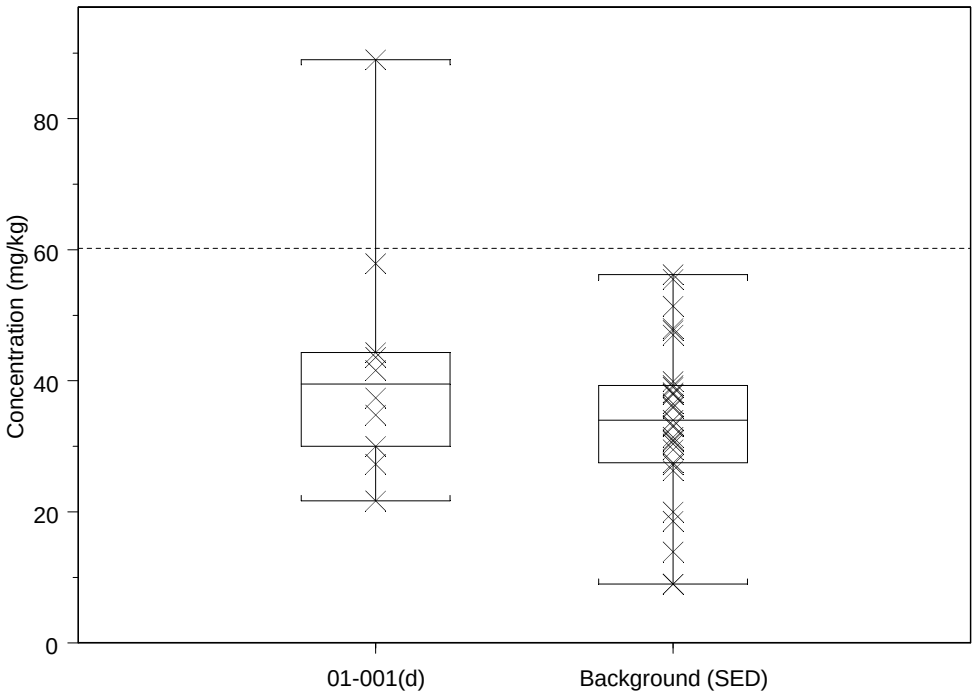


Figure F-3.4-39 Site concentrations of zinc in sediment at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

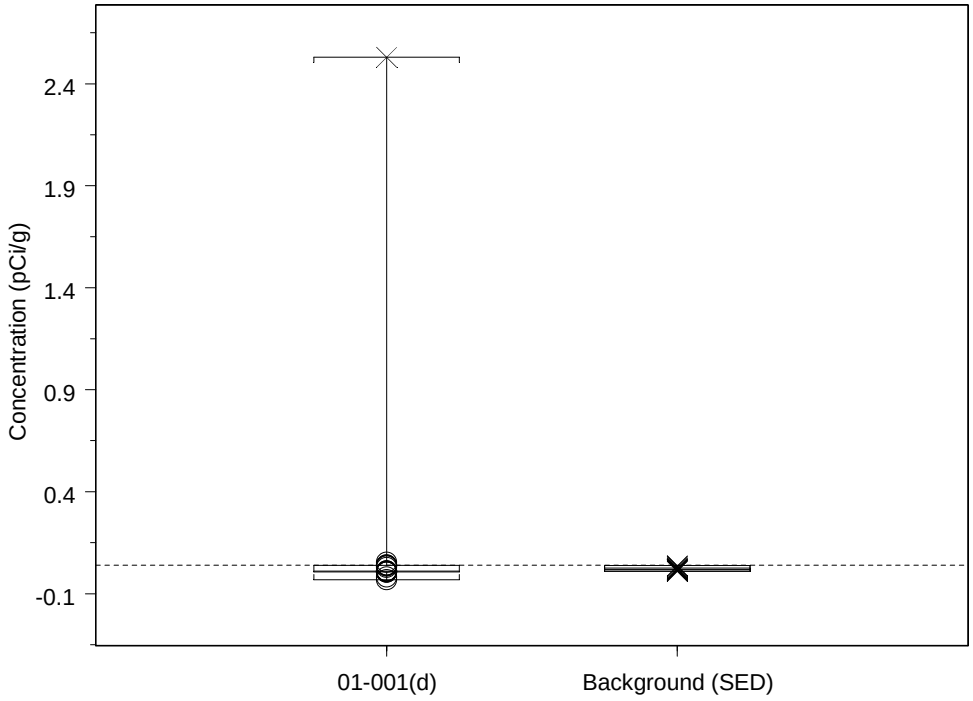


Figure F-3.4-40 Site concentrations of americium-241 in sediment at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

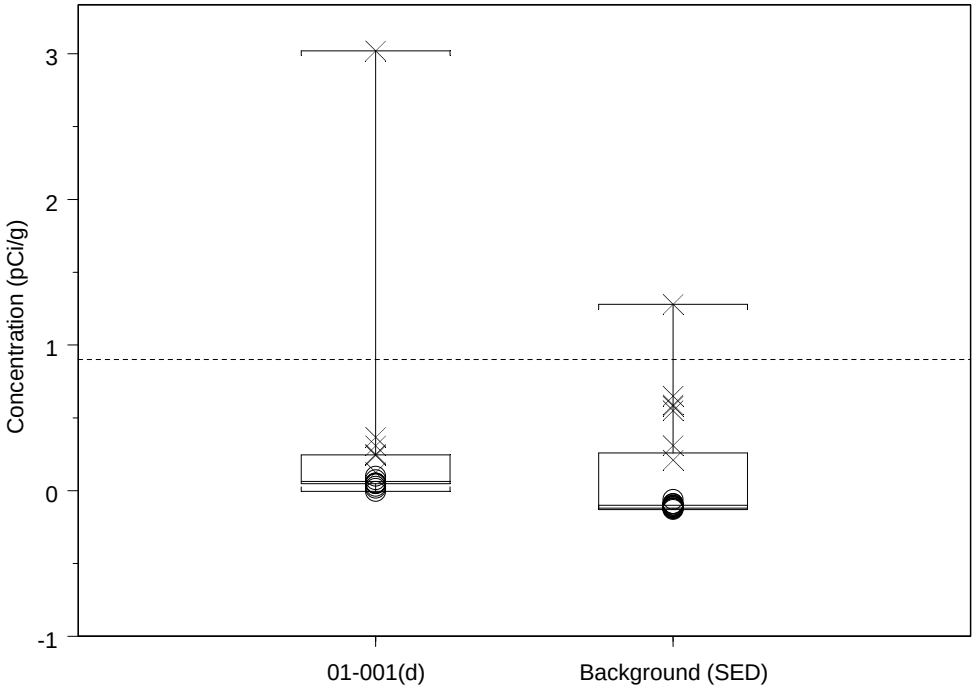


Figure F-3.4-41 Site concentrations of cesium-137 in sediment at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

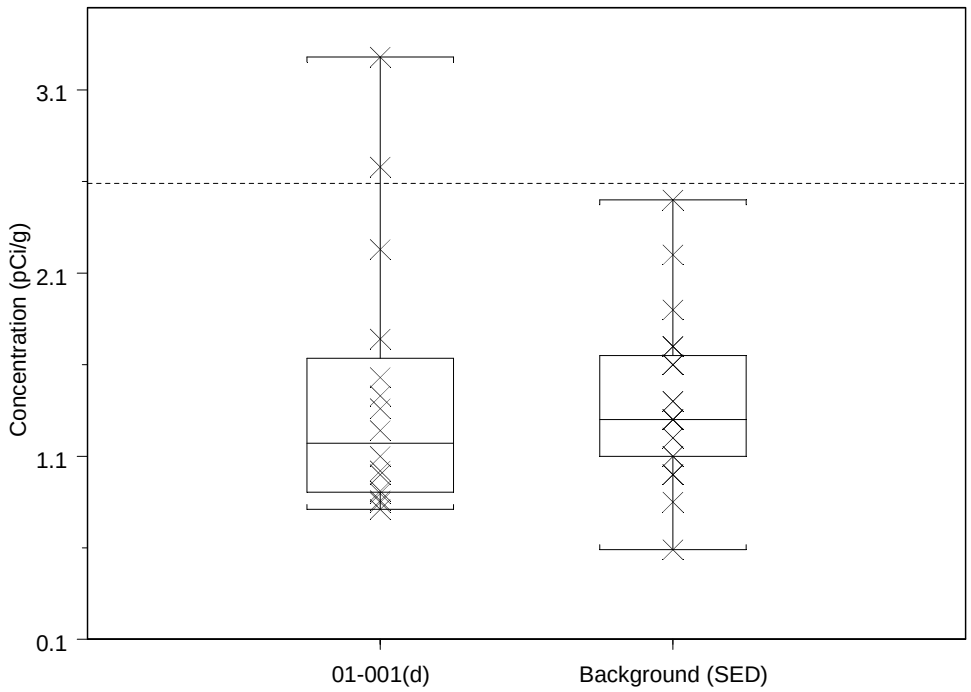


Figure F-3.4-42 Site concentrations of uranium-234 in sediment at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

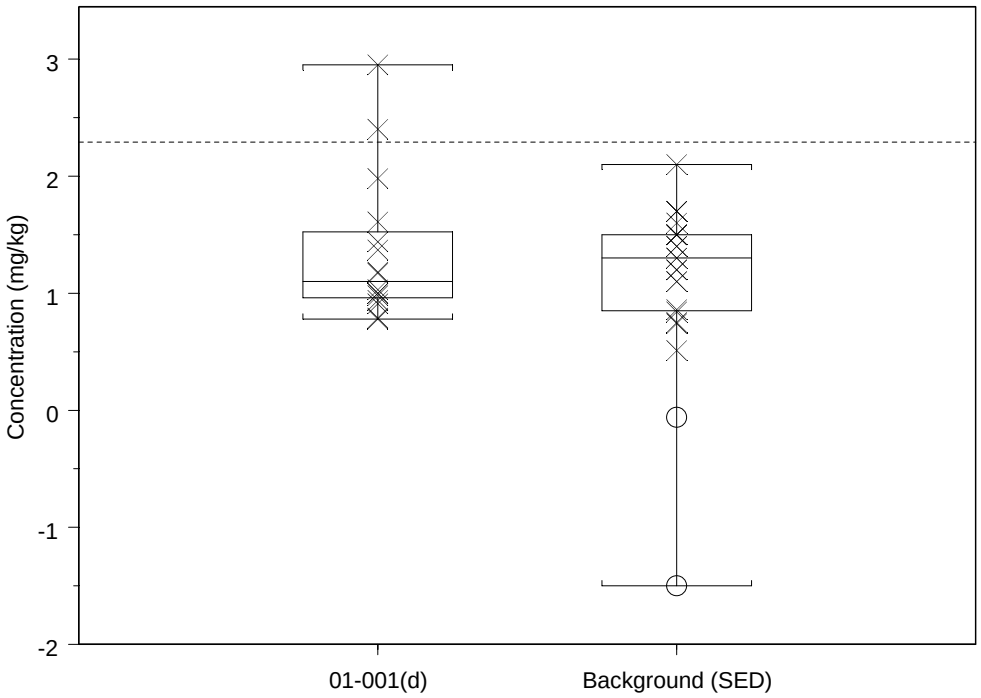


Figure F-3.4-43 Site concentrations of uranium-238 in sediment at SWMU 01-001(d) compared to background

(× = detect, ○ = nondetect)

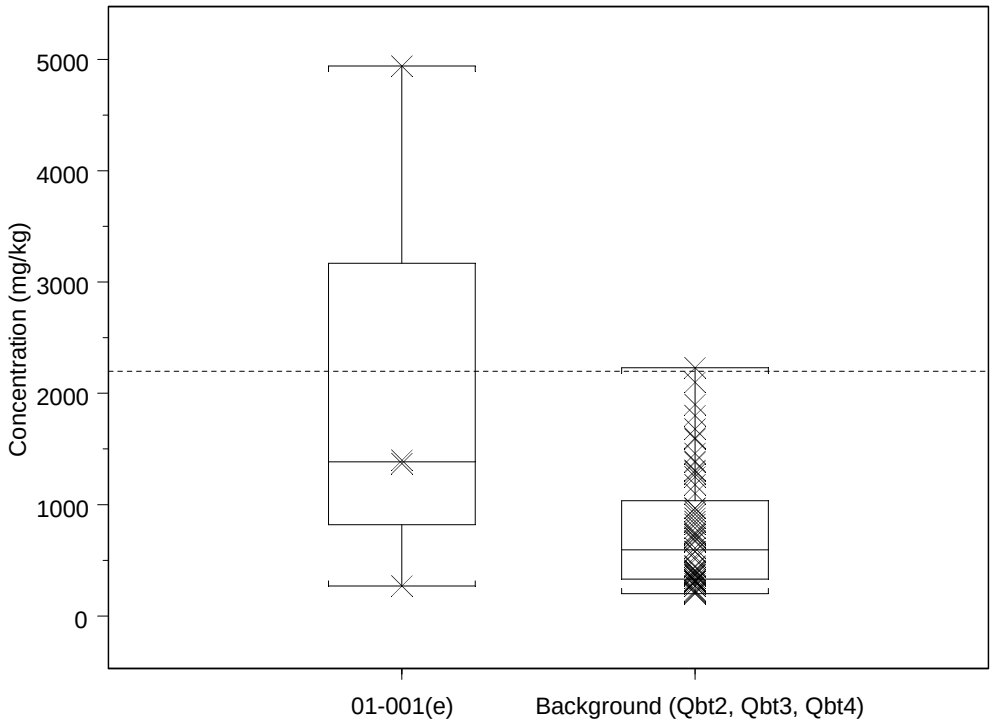


Figure F-3.5-1 Site concentrations of calcium in tuff at SWMU 01-001(e) compared to background

(× = detect, ○ = nondetect)

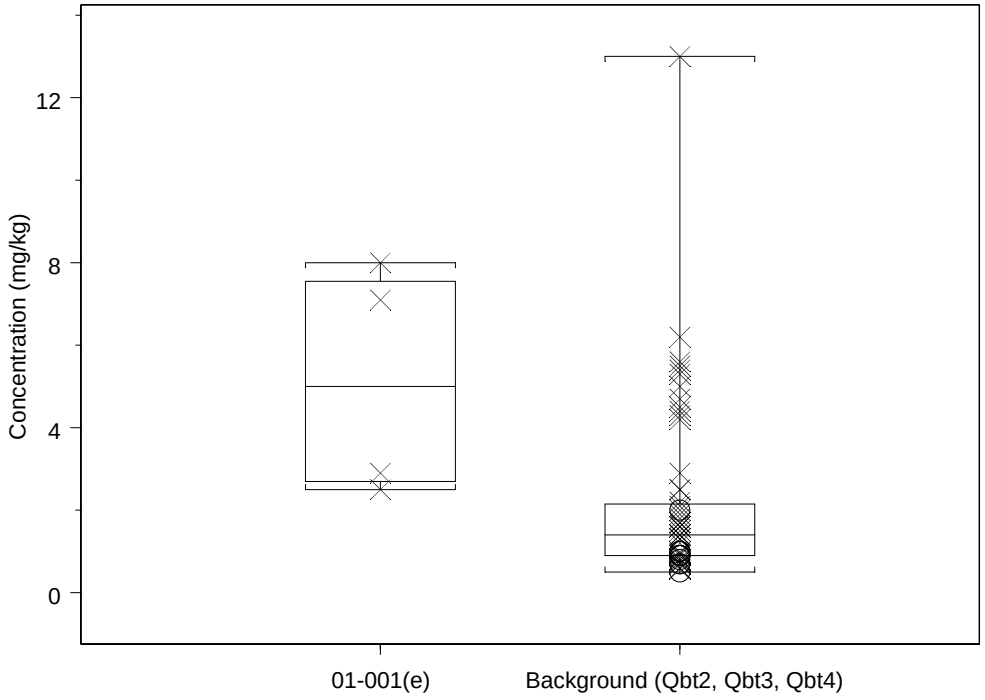


Figure F-3.5-2 Site concentrations of chromium in tuff at SWMU 01-001(e) compared to background

(× = detect, ○ = nondetect)

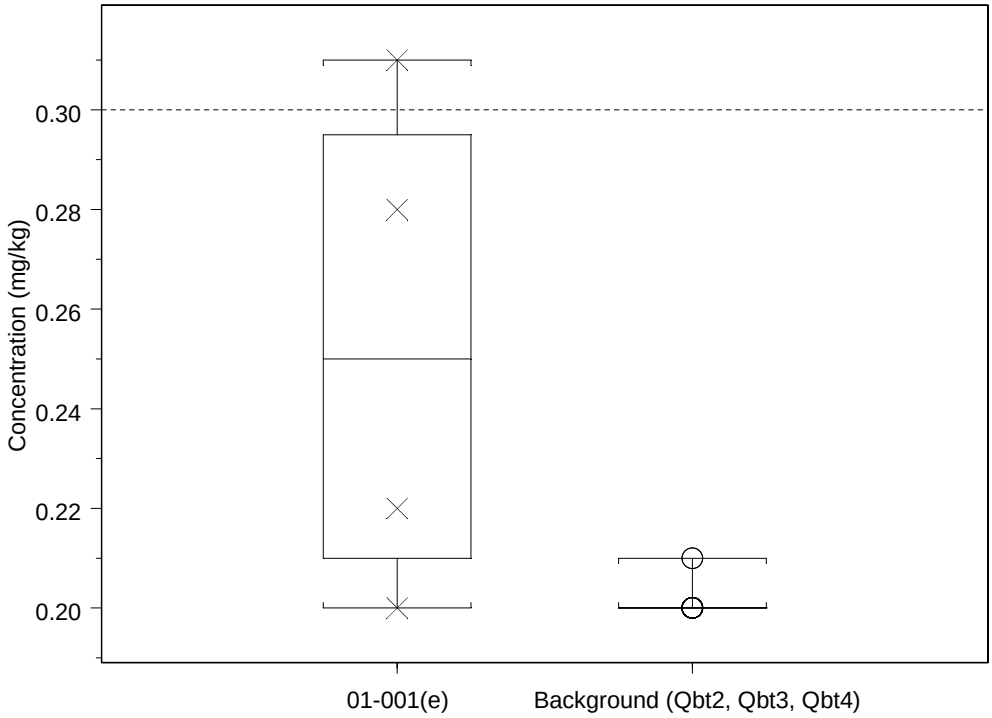


Figure F-3.5-3 Site concentrations of selenium in tuff at SWMU 01-001(e) compared to background

(× = detect, ○ = nondetect)

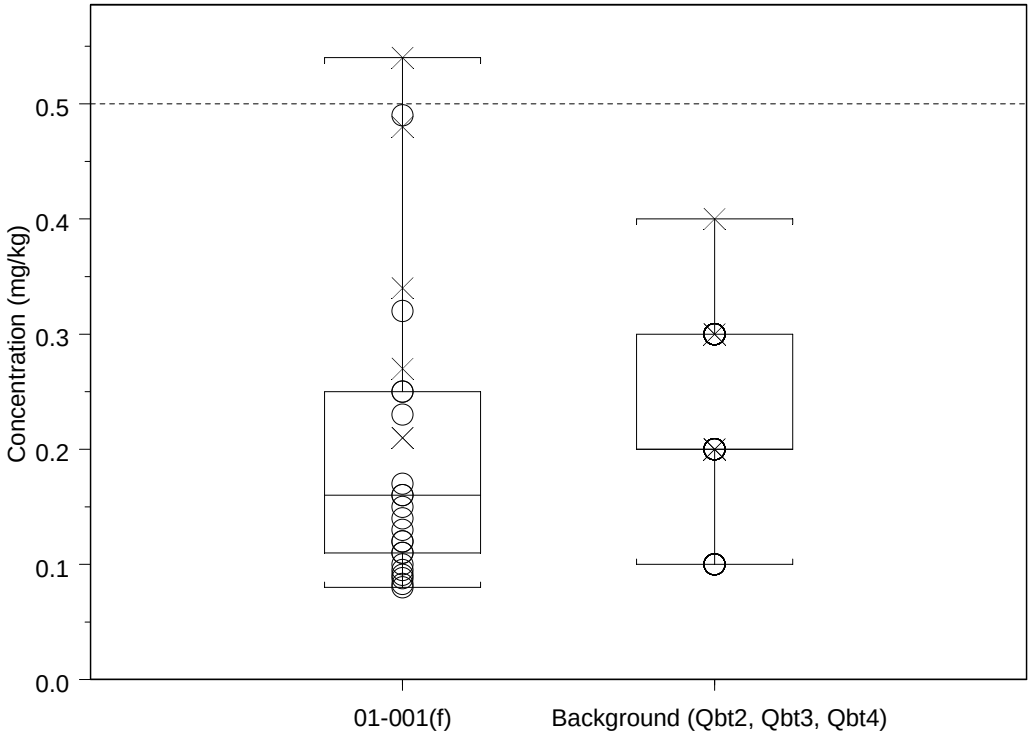


Figure F-3.6-1 Site concentrations of antimony in tuff at SWMU 01-001(f) compared to background

(× = detect, ○ = nondetect)

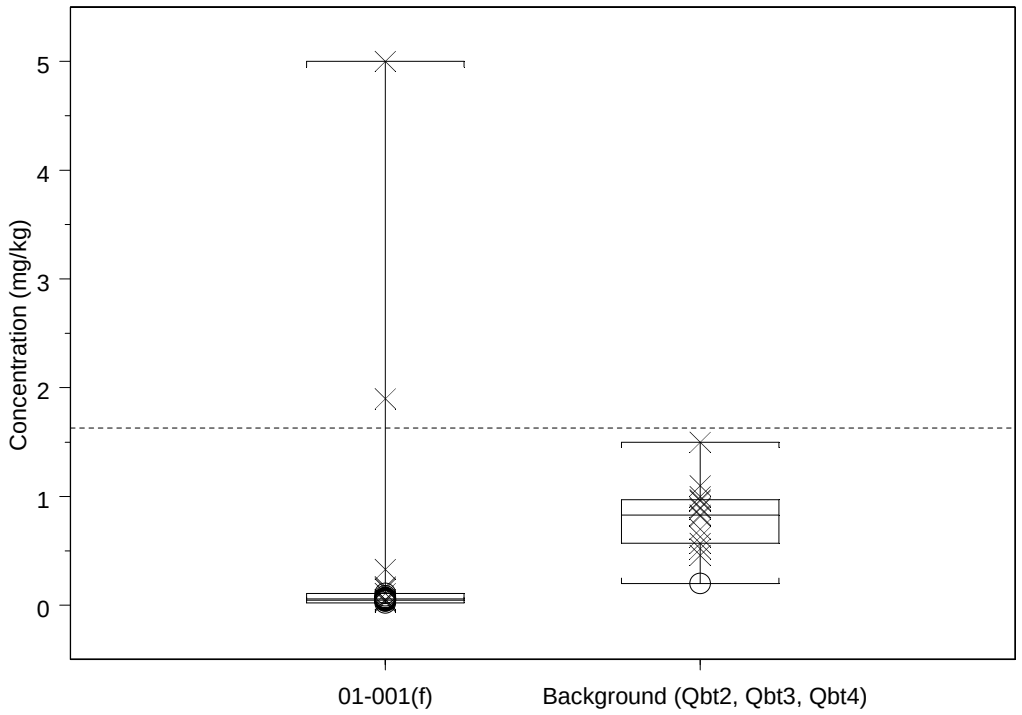


Figure F-3.6-2 Site concentrations of cadmium in tuff at SWMU 01-001(f) compared to background

(× = detect, ○ = nondetect)

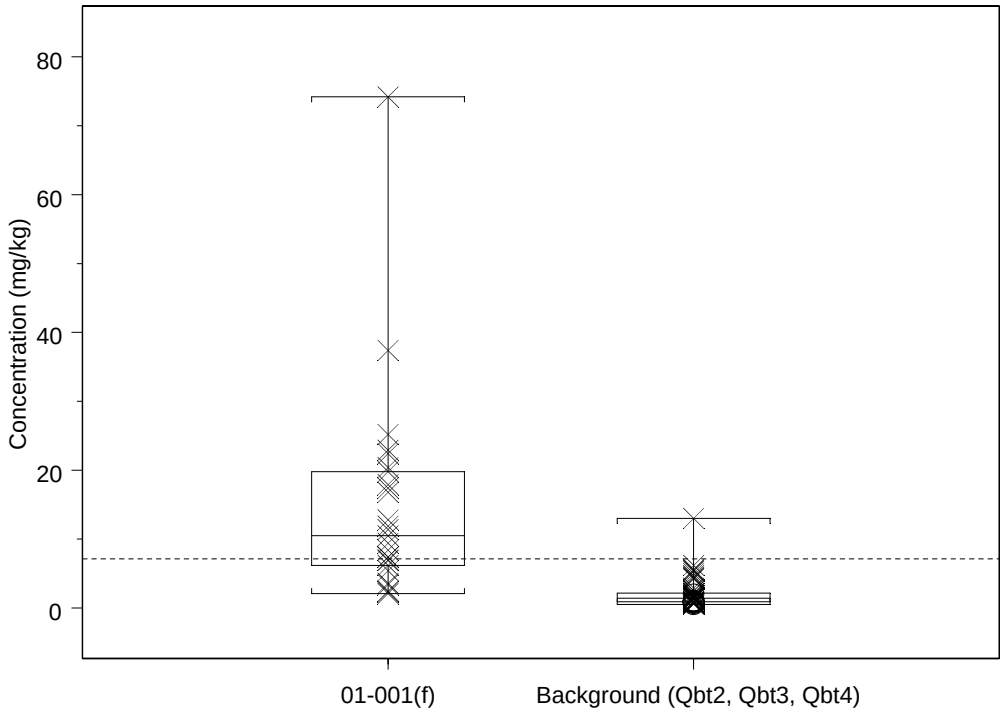


Figure F-3.6-3 Site concentrations of chromium in tuff at SWMU 01-001(f) compared to background

(× = detect, ○ = nondetect)

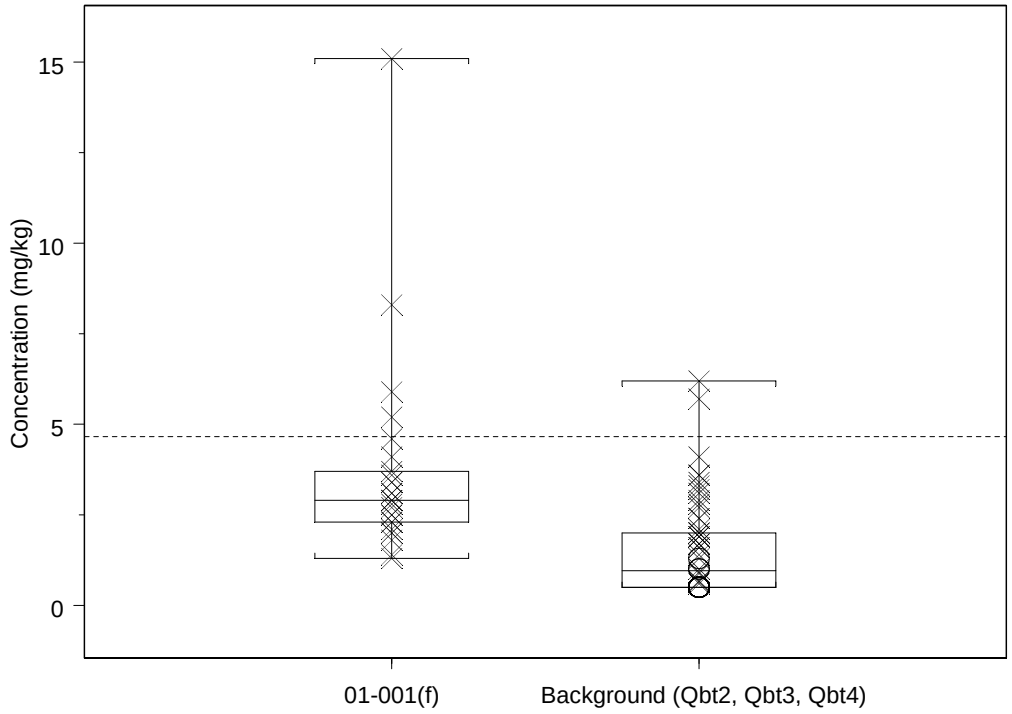


Figure F-3.6-4 Site concentrations of copper in tuff at SWMU 01-001(f) compared to background
(× = detect, ○ = nondetect)

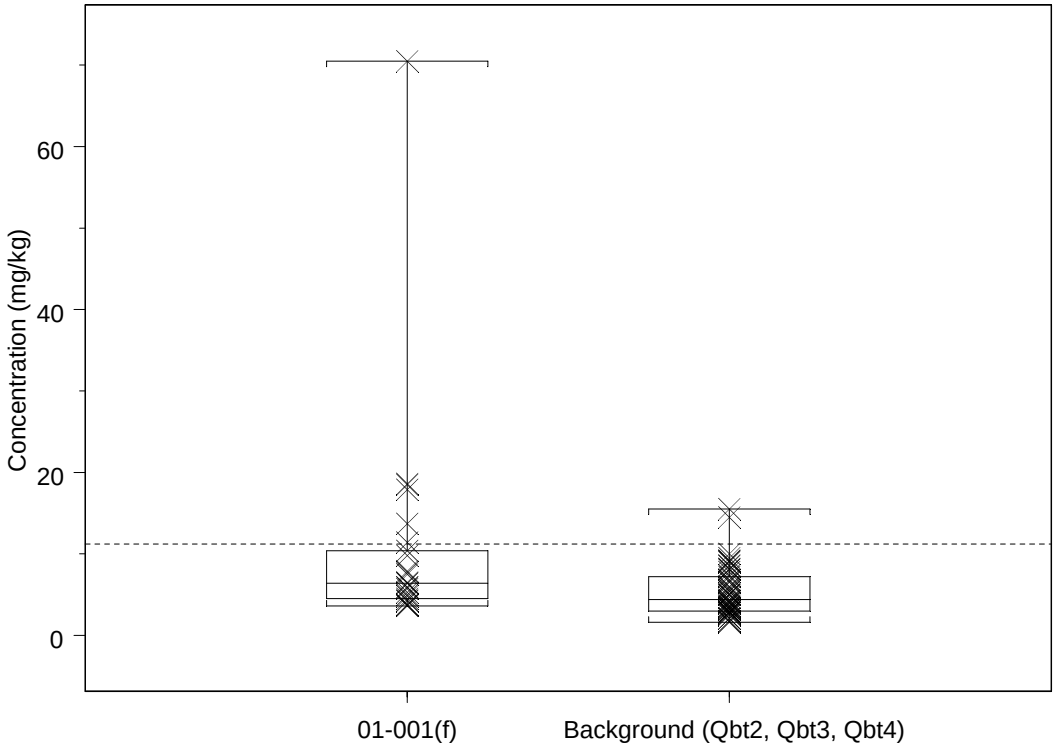


Figure F-3.6-5 Site concentrations of lead in tuff at SWMU 01-001(f) compared to background
(× = detect, ○ = nondetect)

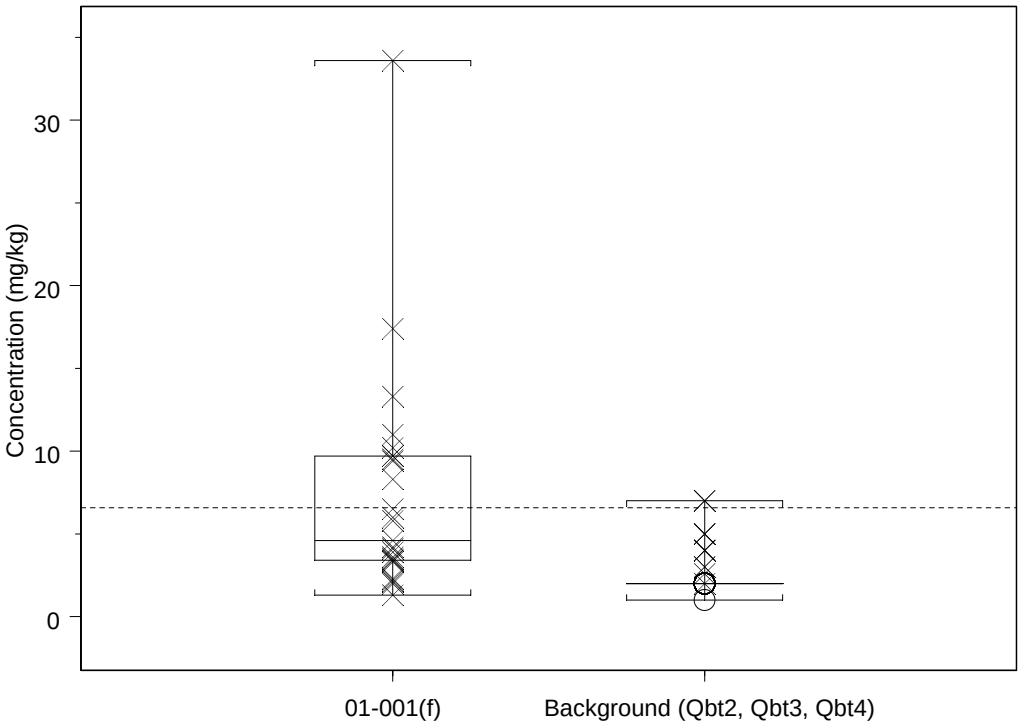


Figure F-3.6-6 Site concentrations of nickel in tuff at SWMU 01-001(f) compared to background

(× = detect, ○ = nondetect)

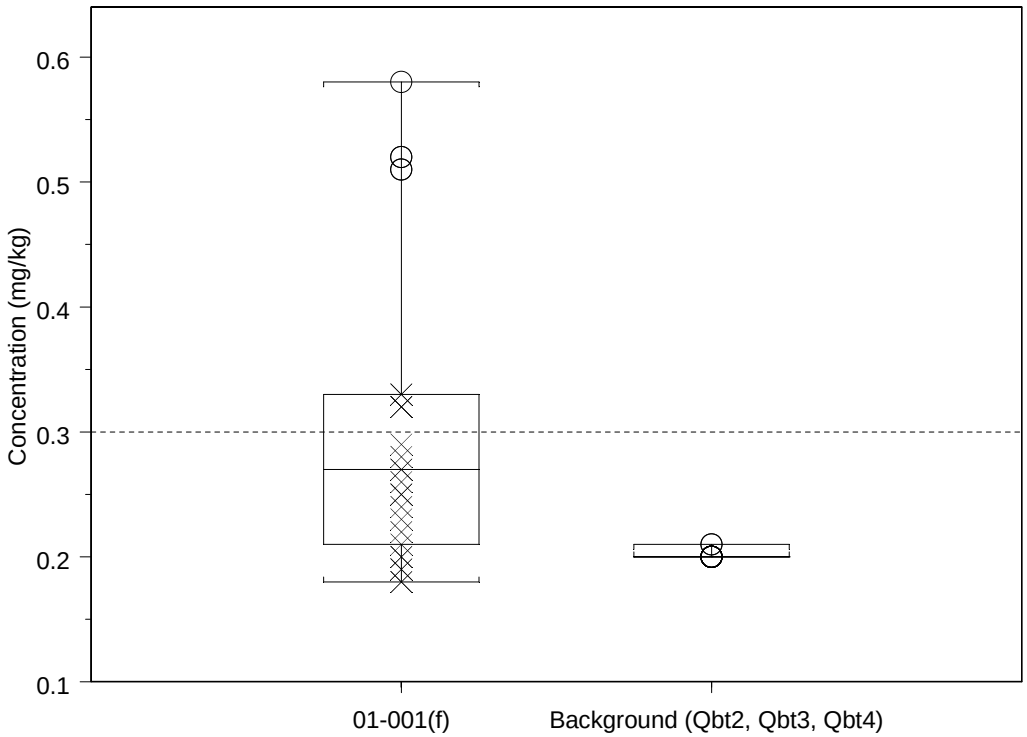


Figure F-3.6-7 Site concentrations of selenium in tuff at SWMU 01-001(f) compared to background

(× = detect, ○ = nondetect)

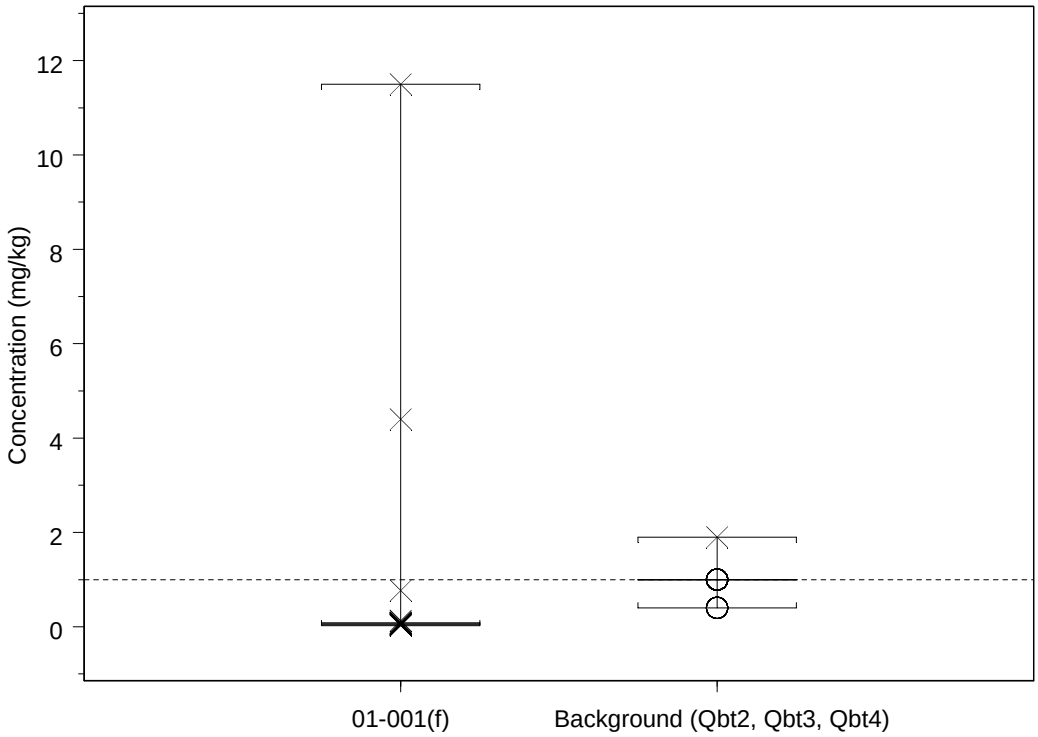


Figure F-3.6-8 Site concentrations of silver in tuff at SWMU 01-001(f) compared to background

(× = detect, ○ = nondetect)

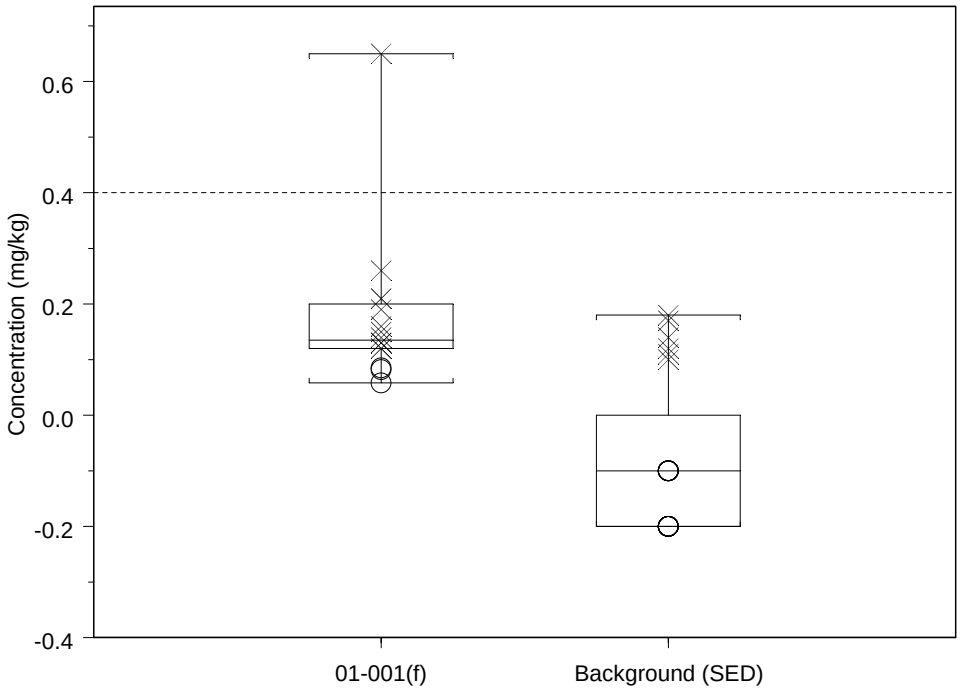


Figure F-3.6-9 Site concentrations of cadmium in sediment at SWMU 01-001(f) compared to background

(× = detect, ○ = nondetect)

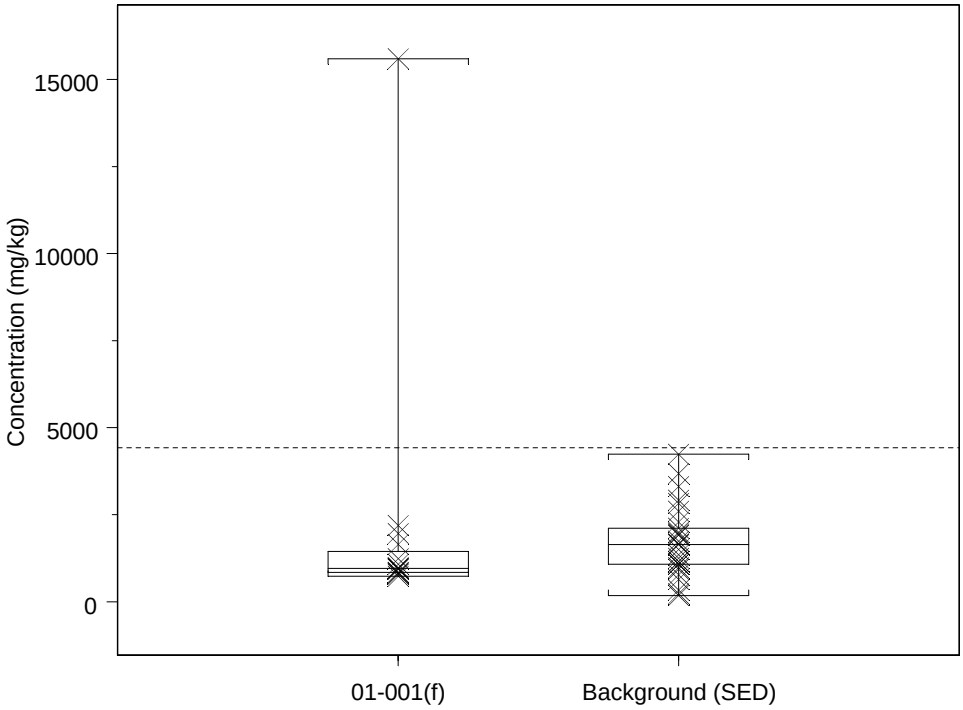


Figure F-3.6-10 Site concentrations of calcium in sediment at SWMU 01-001(f) compared to background

(× = detect, ○ = nondetect)

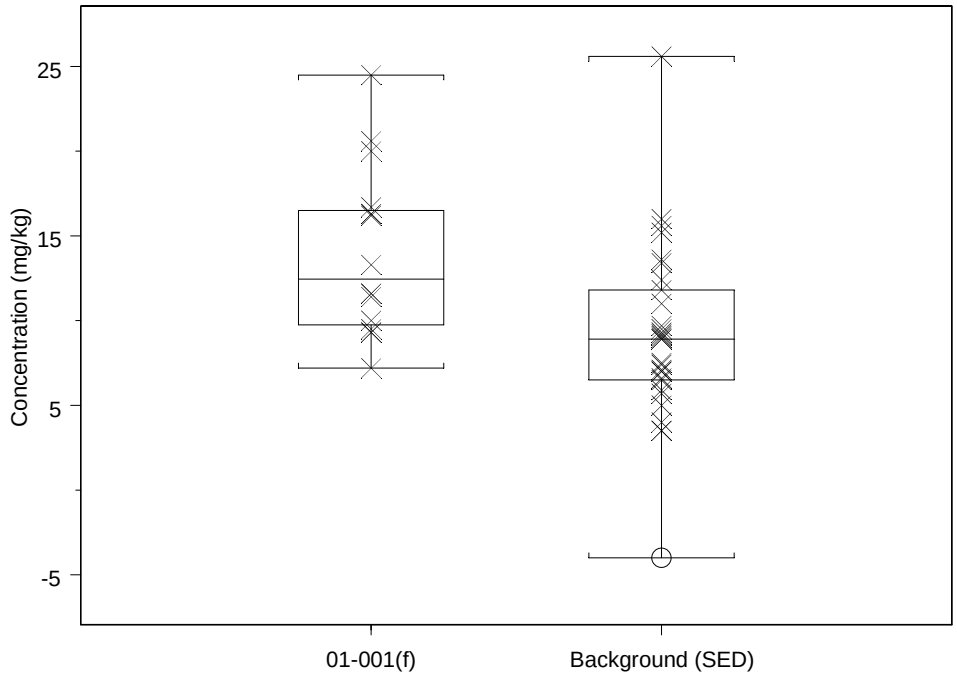


Figure F-3.6-11 Site concentrations of lead in sediment at SWMU 01-001(f) compared to background

(× = detect, ○ = nondetect)

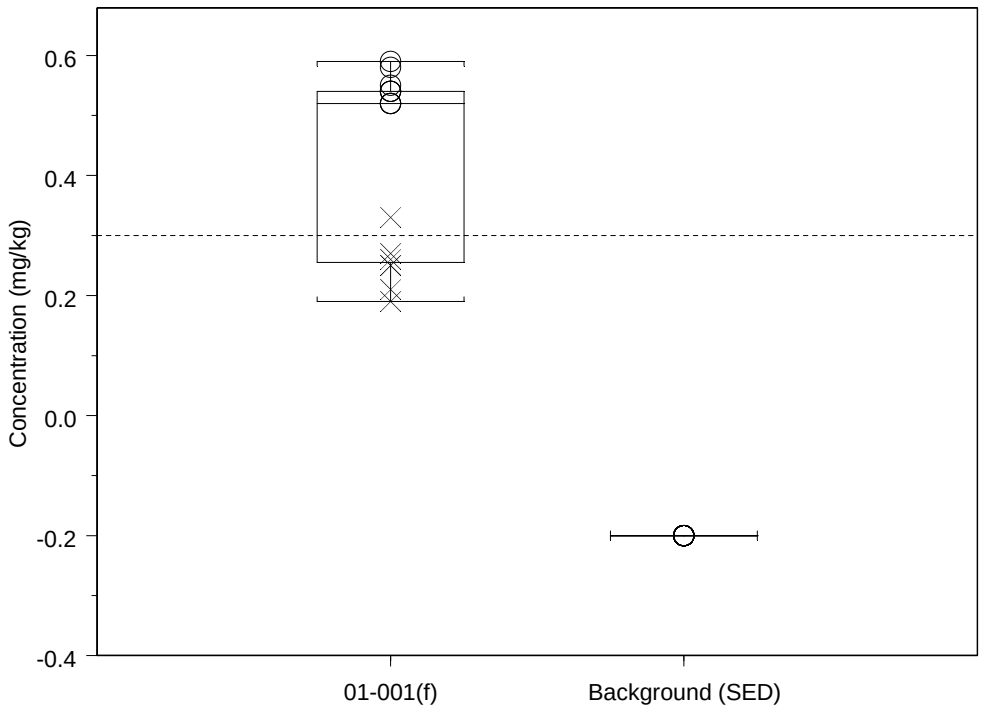


Figure F-3.6-12 Site concentrations of selenium in sediment at SWMU 01-001(f) compared to background

(× = detect, ○ = nondetect)

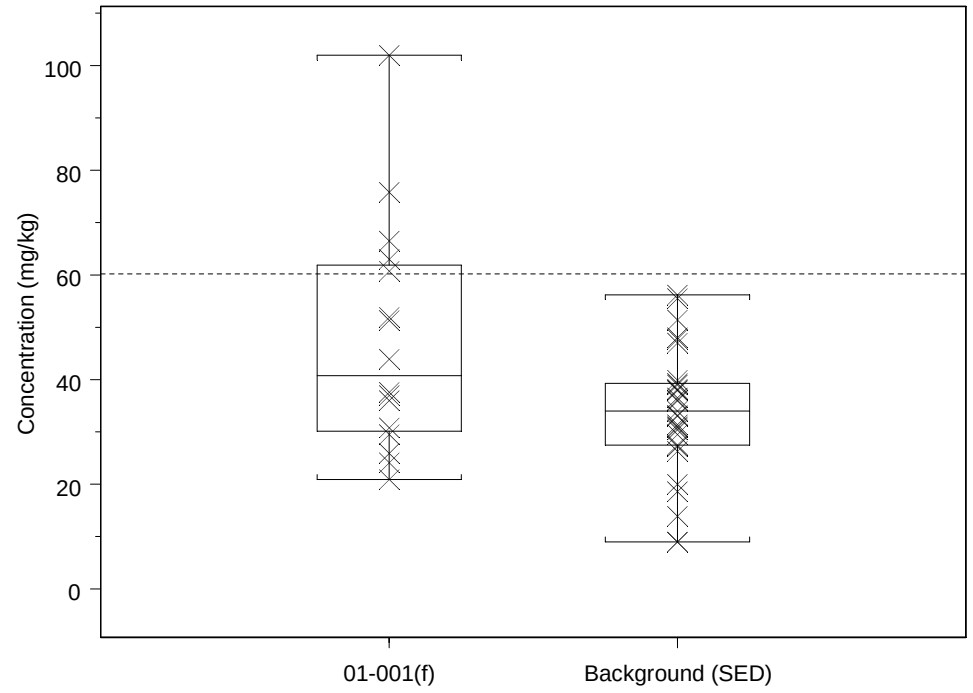


Figure F-3.6-13 Site concentrations of zinc in sediment at SWMU 01-001(f) compared to background

(× = detect, ○ = nondetect)

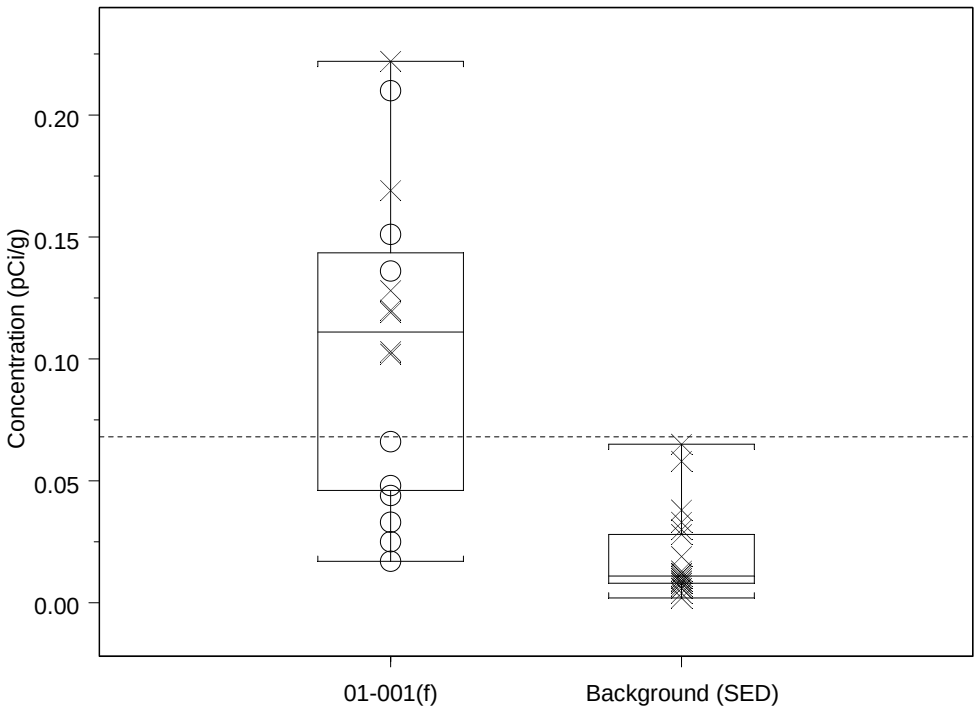


Figure F-3.6-14 Site concentrations of plutonium-239/240 in sediment at SWMU 01-001(f) compared to background

(× = detect, ○ = nondetect)

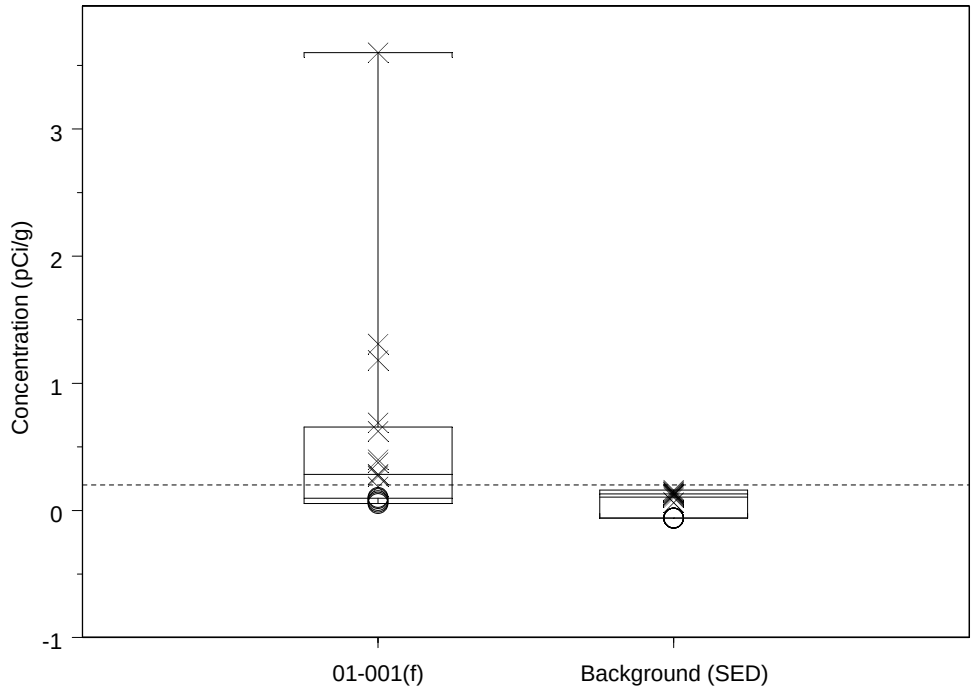


Figure F-3.6-15 Site concentrations of uranium-235/236 in sediment at SWMU 01-001(f) compared to background

(× = detect, ○ = nondetect)

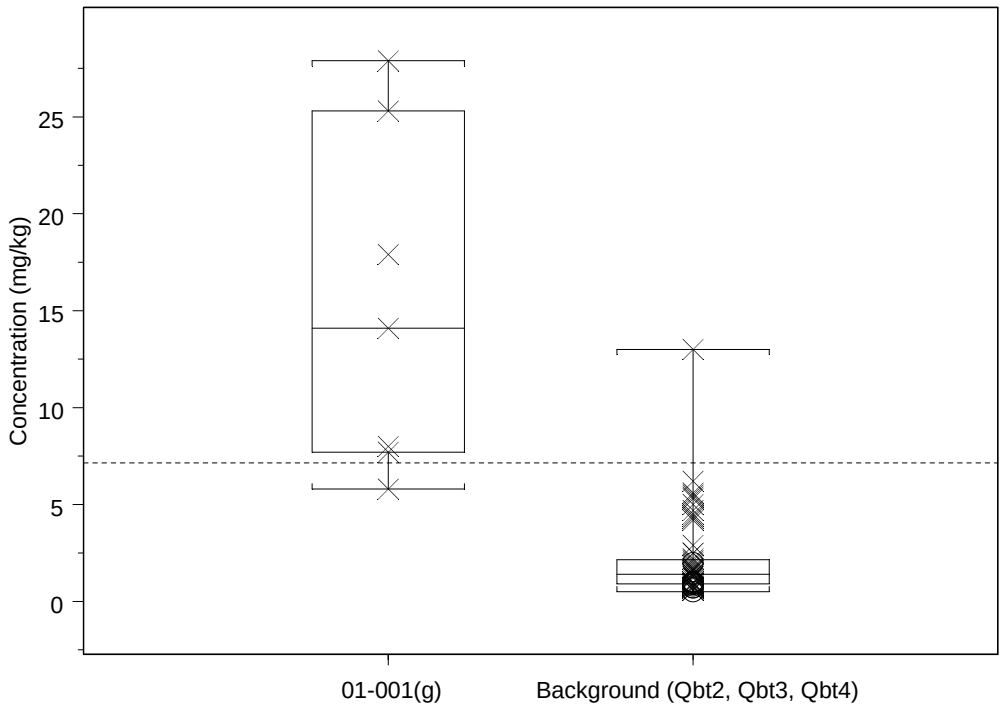


Figure F-3.7-1 Site concentrations of chromium in tuff at SWMU 01-001(g) compared to background

(× = detect, ○ = nondetect)

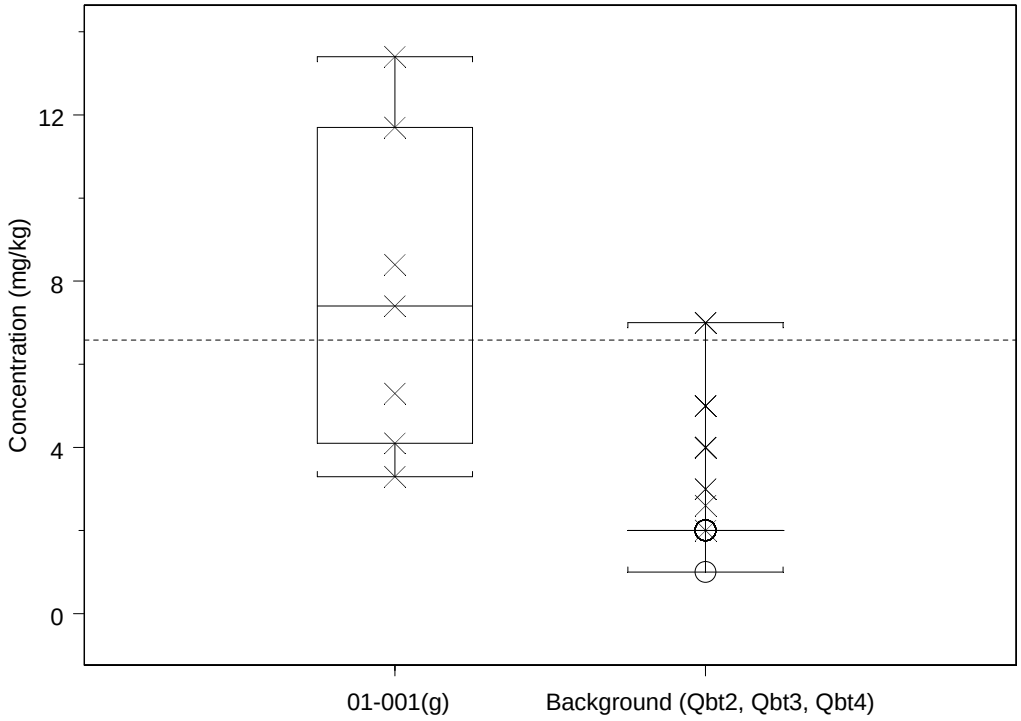


Figure F-3.7-2 Site concentrations of nickel in tuff at SWMU 01-001(g) compared to background

(× = detect, ○ = nondetect)

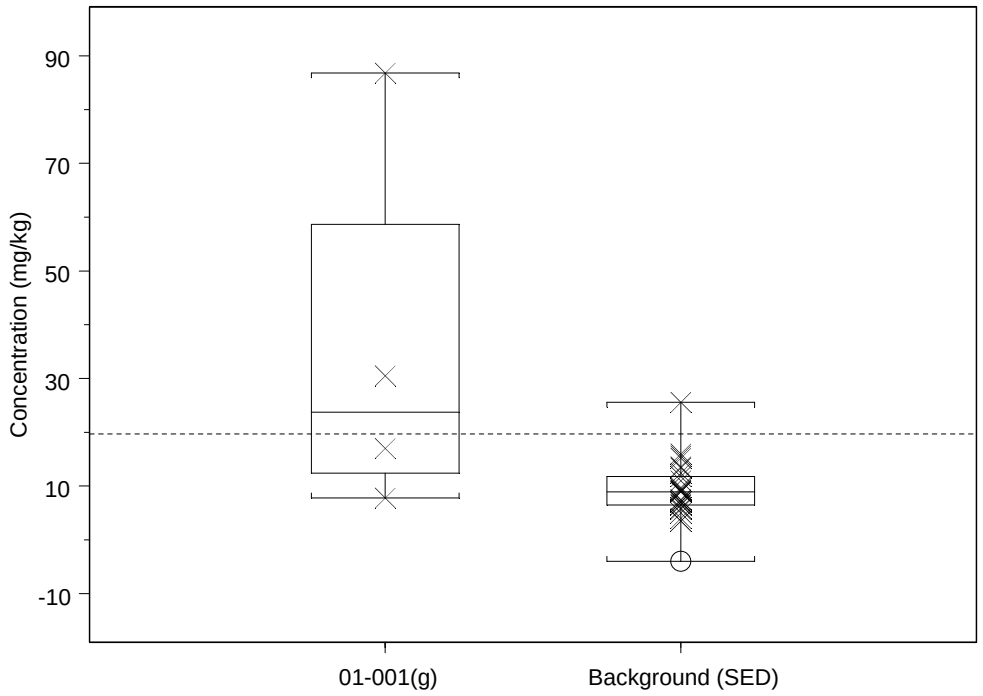


Figure F-3.7-3 Site concentrations of lead in sediment at SWMU 01-001(g) compared to background

(× = detect, ○ = nondetect)

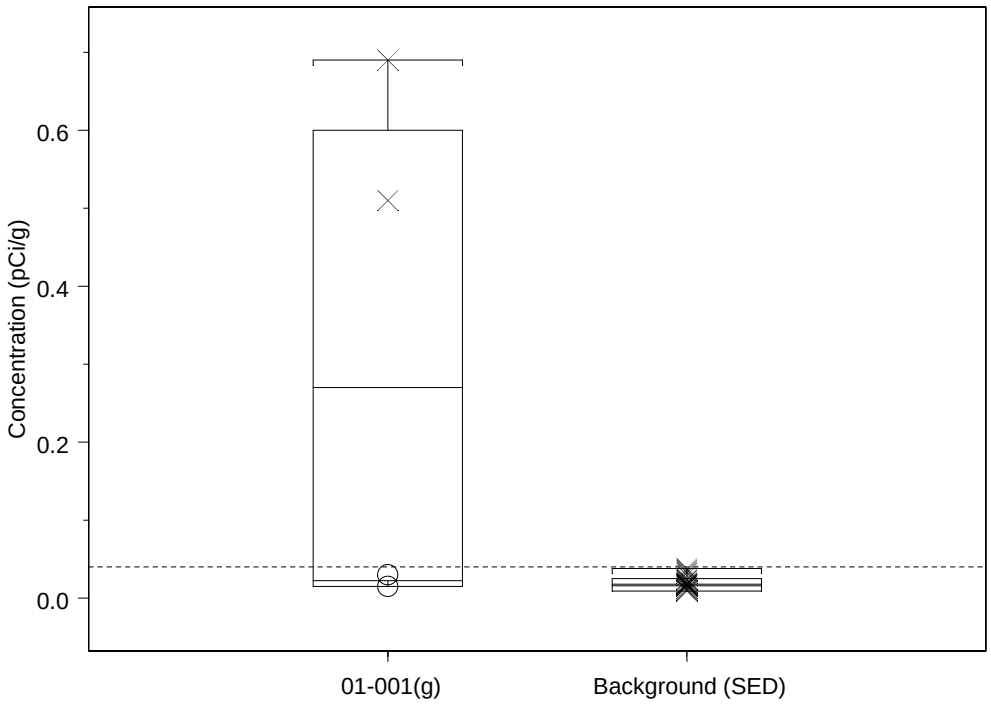


Figure F-3.7-4 Site concentrations of americium-241 in sediment at SWMU 01-001(g) compared to background

(× = detect, ○ = nondetect)

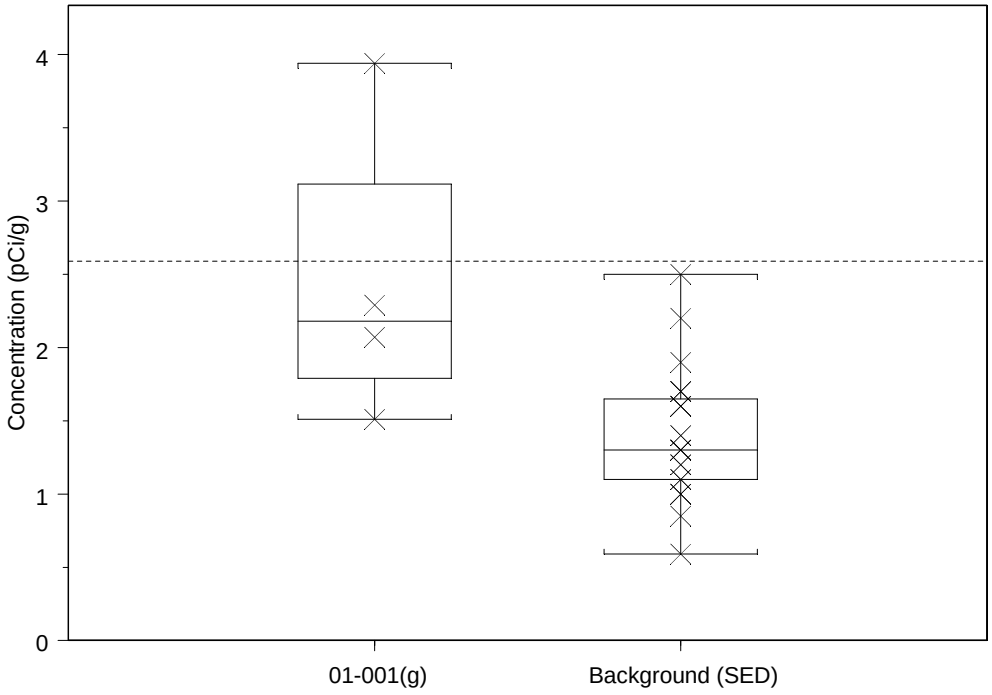


Figure F-3.7-5 Site concentrations of uranium-234 in sediment at SWMU 01-001(g) compared to background

(× = detect, ○ = nondetect)

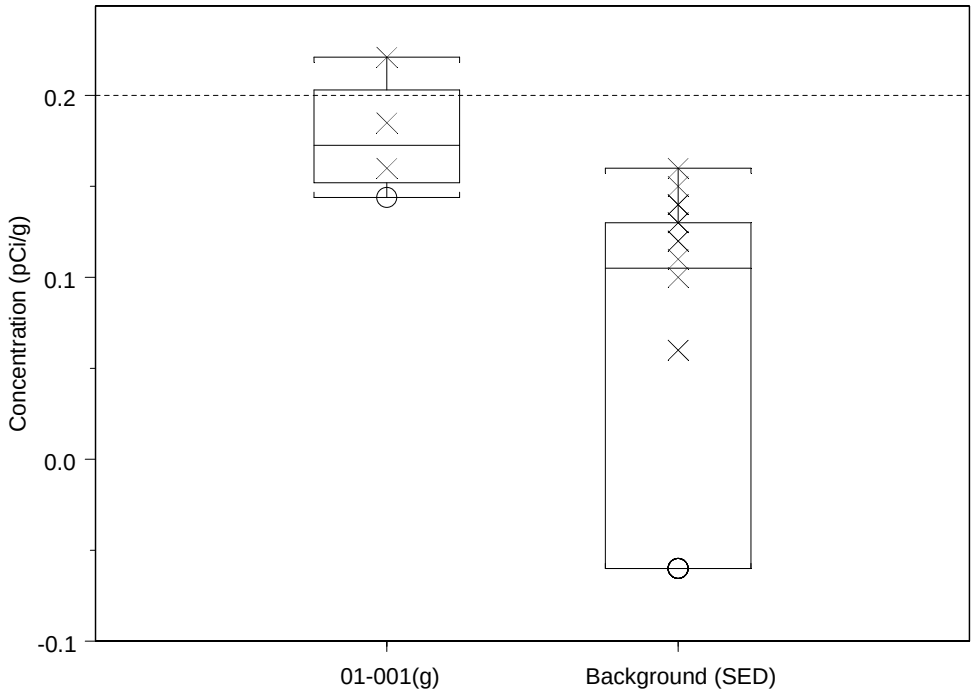


Figure F-3.7-6 Site concentrations of uranium-235/236 in sediment at SWMU 01-001(g) compared to background

(× = detect, ○ = nondetect)

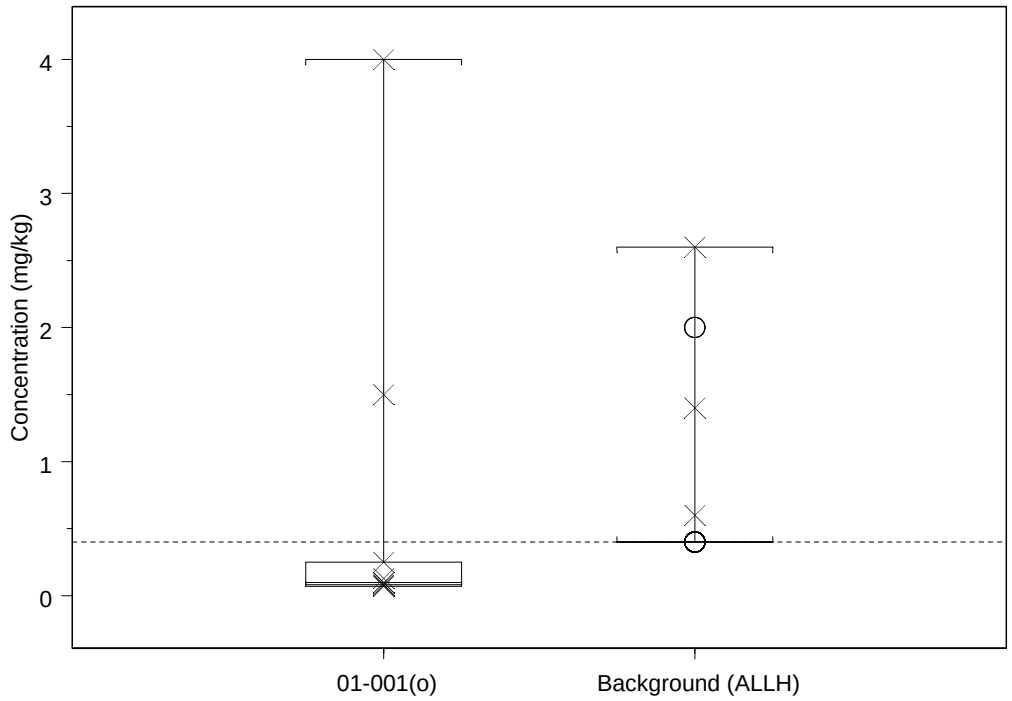


Figure F-3.8-1 Site concentrations of cadmium in soil at SWMU 01-001(o) compared to background

(× = detect, ○ = nondetect)

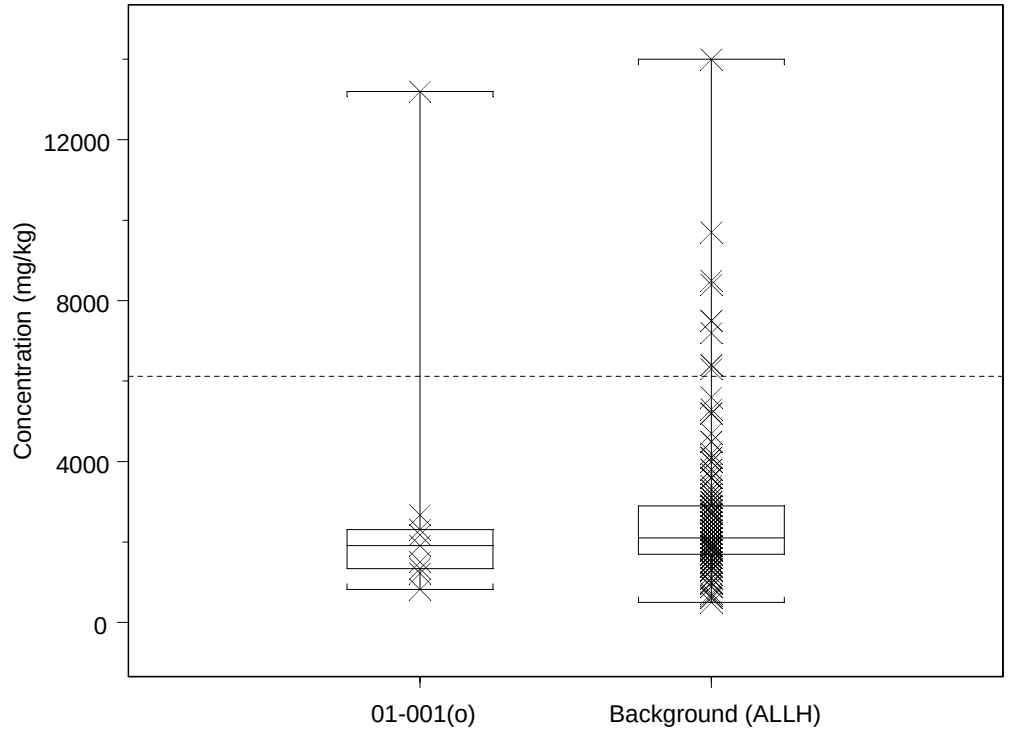


Figure F-3.8-2 Site concentrations of calcium in soil at SWMU 01-001(o) compared to background

(× = detect, ○ = nondetect)

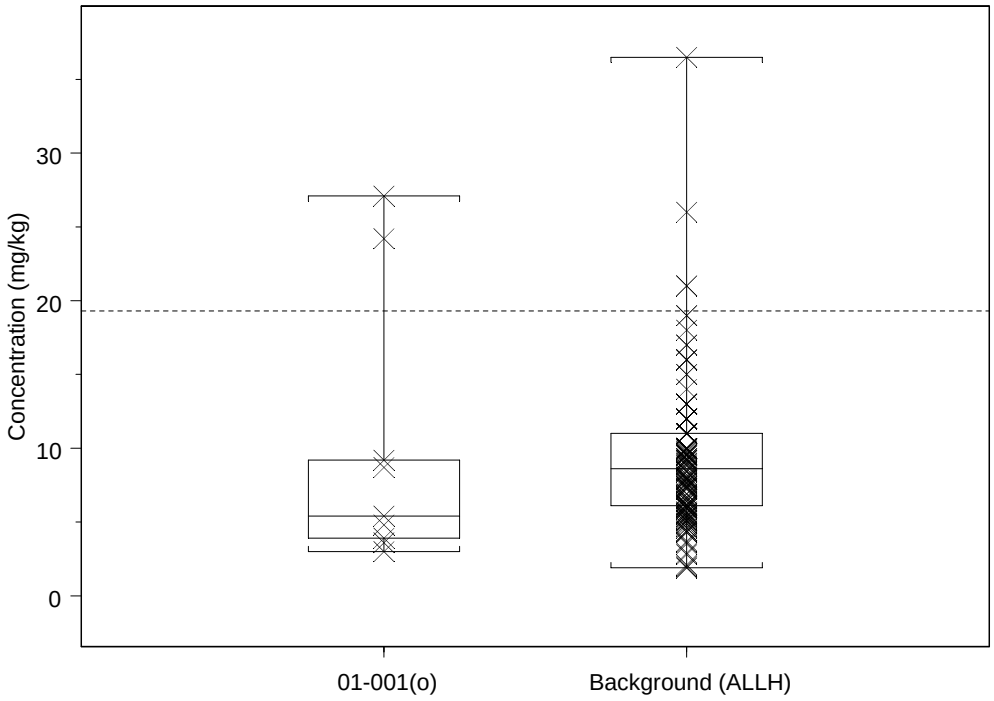


Figure F-3.8-3 Site concentrations of chromium in soil at SWMU 01-001(o) compared to background

(× = detect, ○ = nondetect)

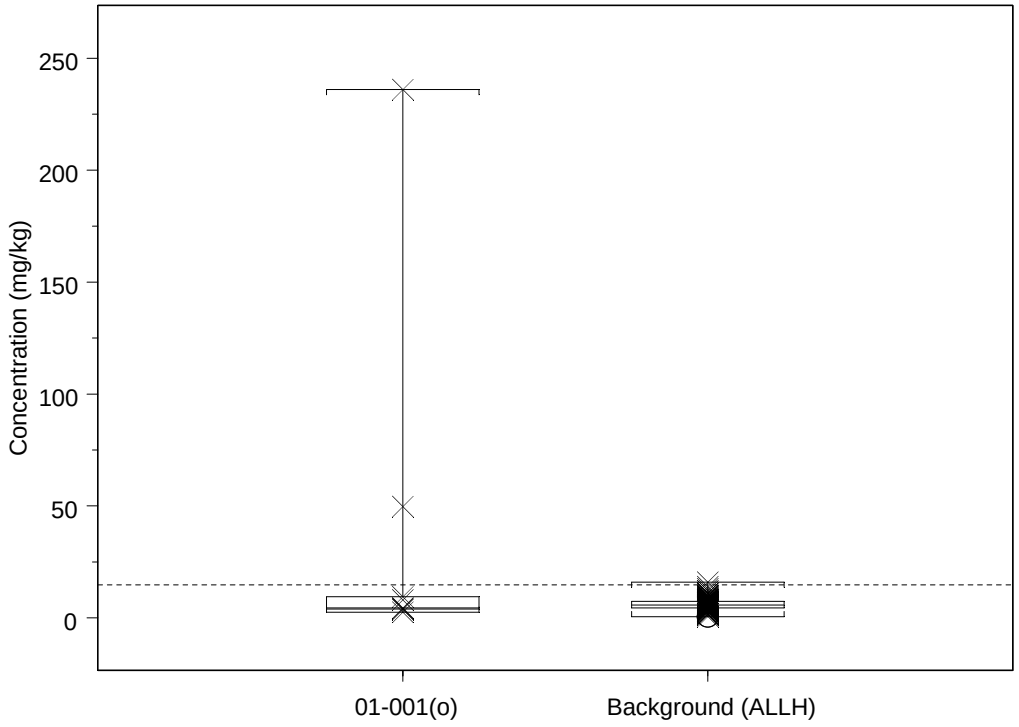


Figure F-3.8-4 Site concentrations of copper in soil at SWMU 01-001(o) compared to background

(× = detect, ○ = nondetect)

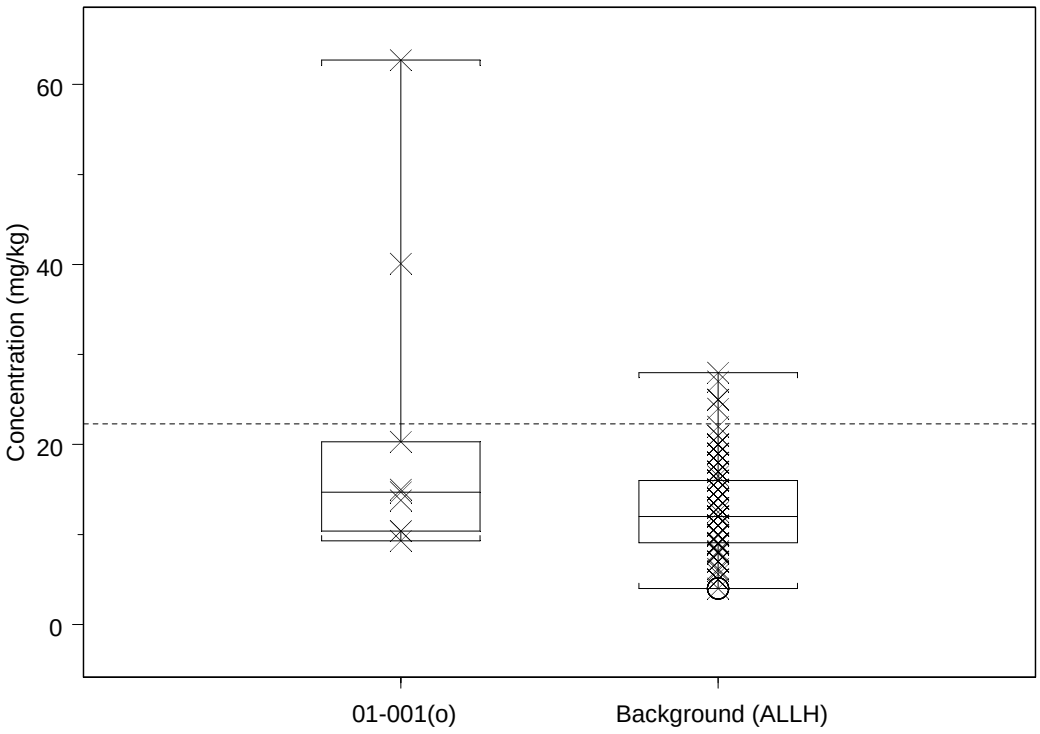


Figure F-3.8-5 Site concentrations of lead in soil at SWMU 01-001(o) compared to background
(× = detect, ○ = nondetect)

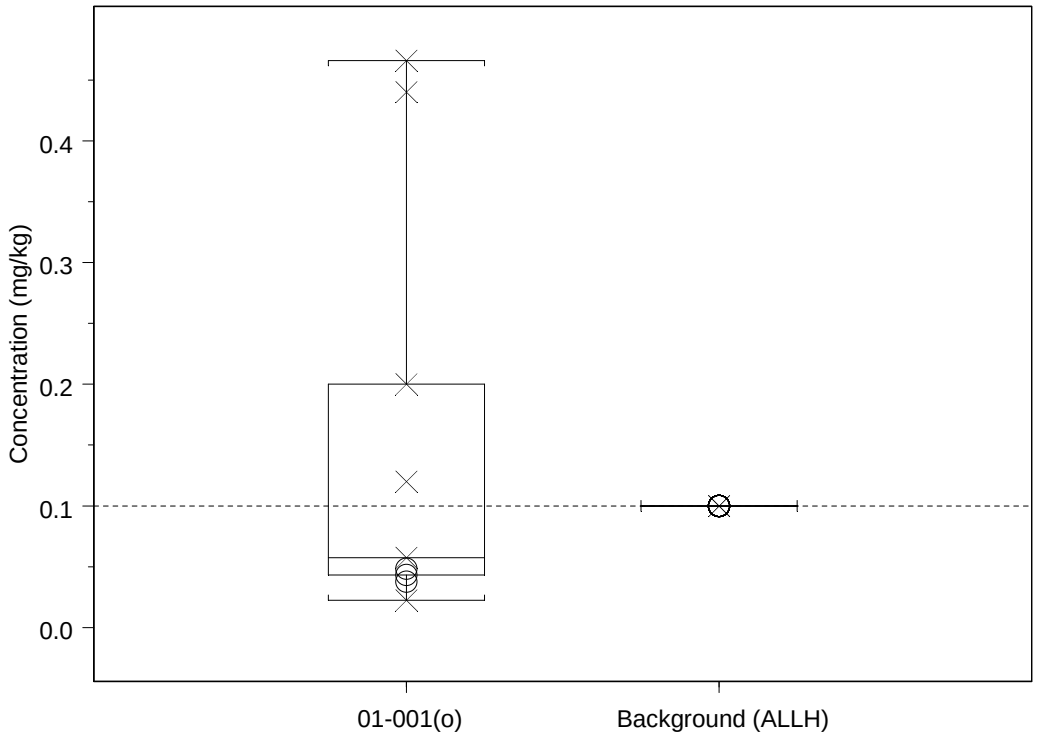


Figure F-3.8-6 Site concentrations of mercury in soil at SWMU 01-001(o) compared to background
(× = detect, ○ = nondetect)

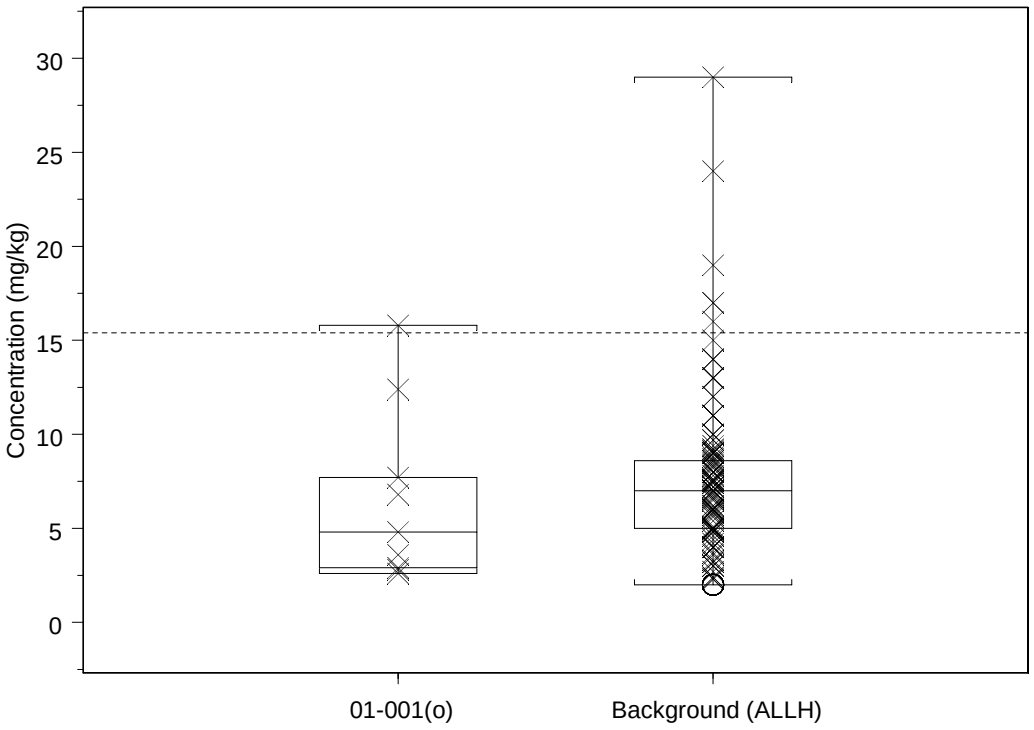


Figure F-3.8-7 Site concentrations of nickel in soil at SWMU 01-001(o) compared to background
(× = detect, ○ = nondetect)

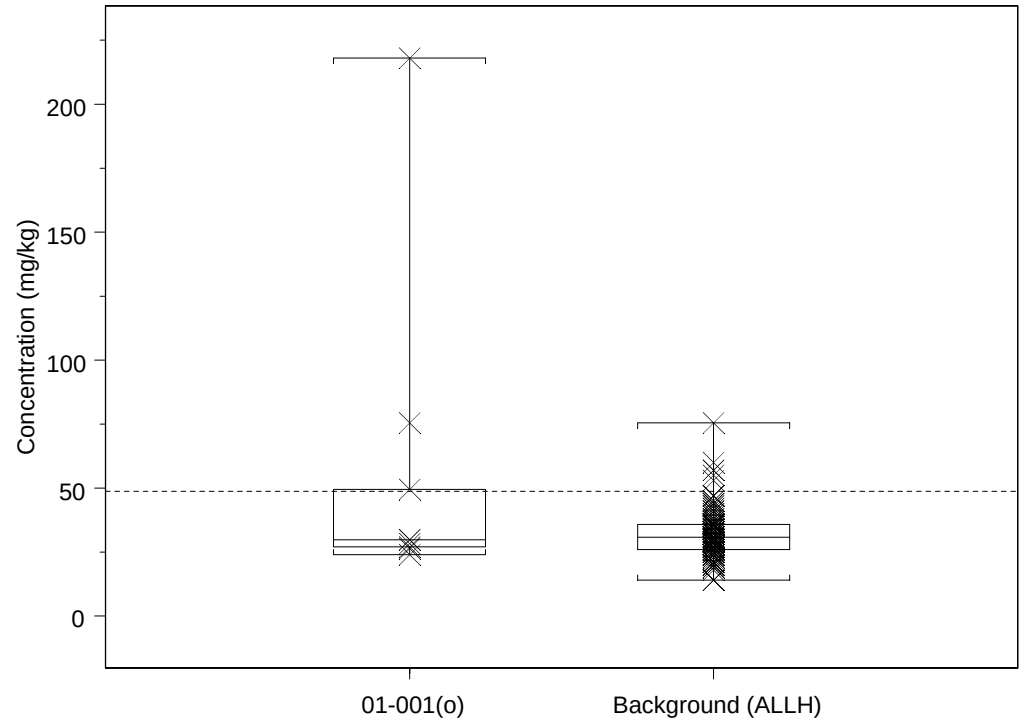


Figure F-3.8-8 Site concentrations of zinc in soil at SWMU 01-001(o) compared to background
(× = detect, ○ = nondetect)

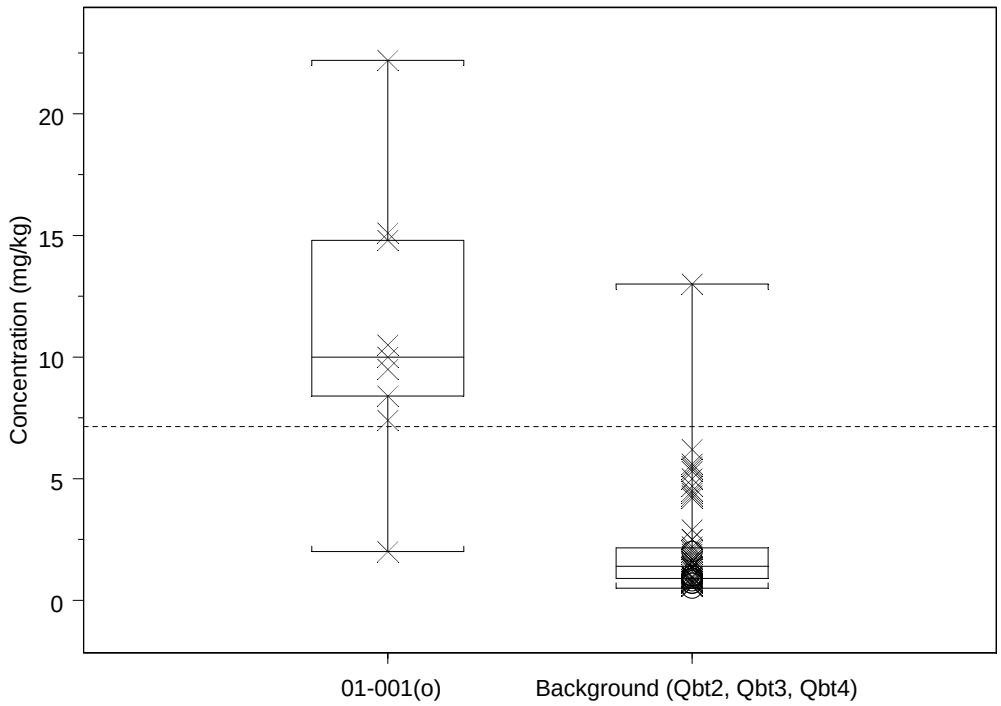


Figure F-3.8-9 Site concentrations of chromium in tuff at SWMU 01-001(o) compared to background

(× = detect, ○ = nondetect)

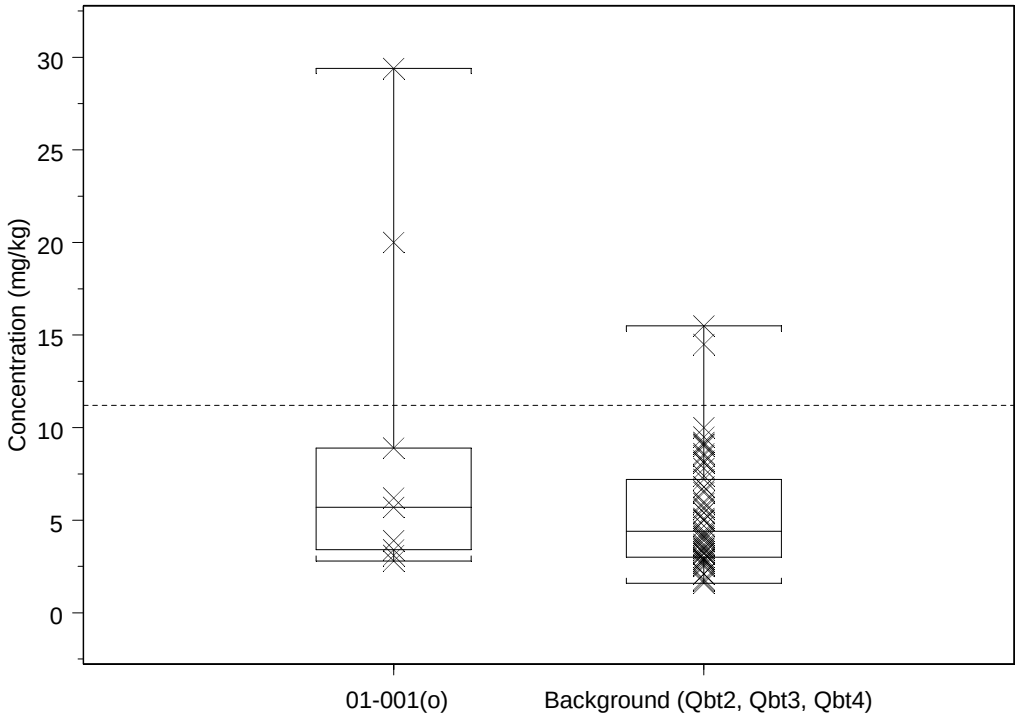


Figure F-3.8-10 Site concentrations of lead in tuff at SWMU 01-001(o) compared to background

(× = detect, ○ = nondetect)

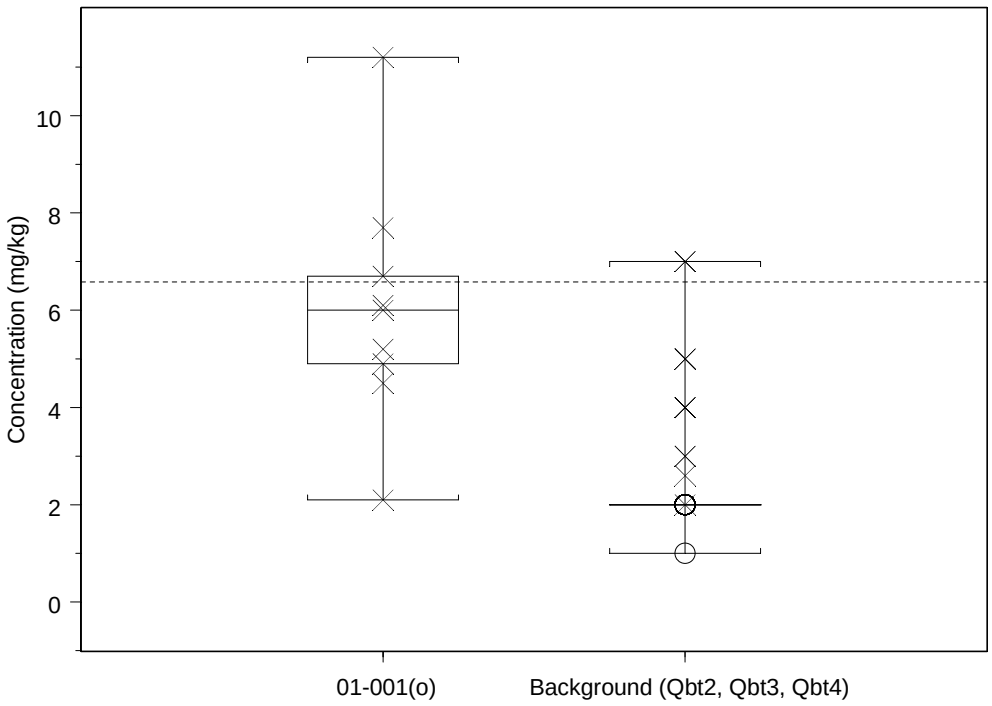


Figure F-3.8-11 Site concentrations of nickel in tuff at SWMU 01-001(o) compared to background
(× = detect, ○ = nondetect)

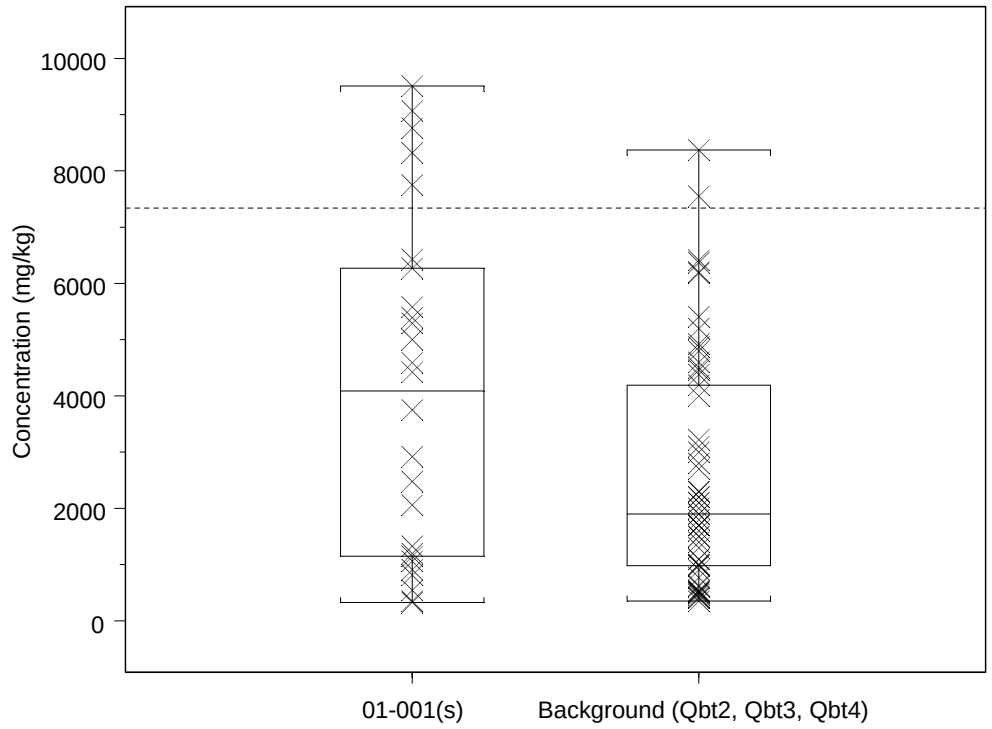


Figure F-3.9-1 Site concentrations of aluminum in tuff at SWMU 01-001(s) compared to background

(× = detect, ○ = nondetect)

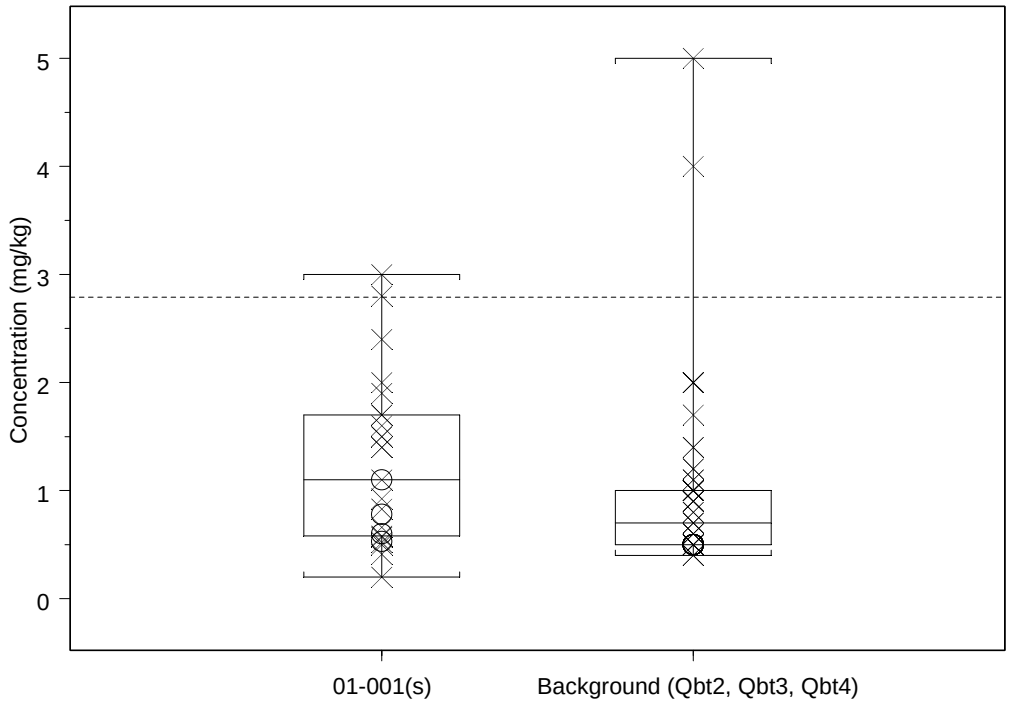


Figure F-3.9-2 Site concentrations of arsenic in tuff at SWMU 01-001(s) compared to background
(× = detect, ○ = nondetect)

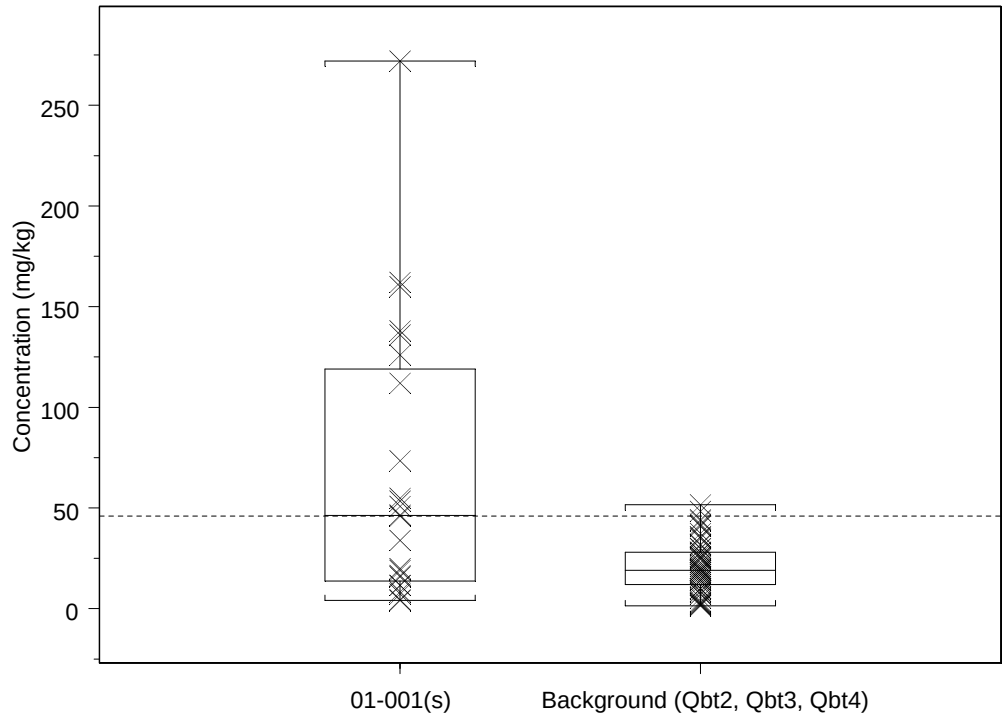


Figure F-3.9-3 Site concentrations of barium in tuff at SWMU 01-001(s) compared to background
(× = detect, ○ = nondetect)

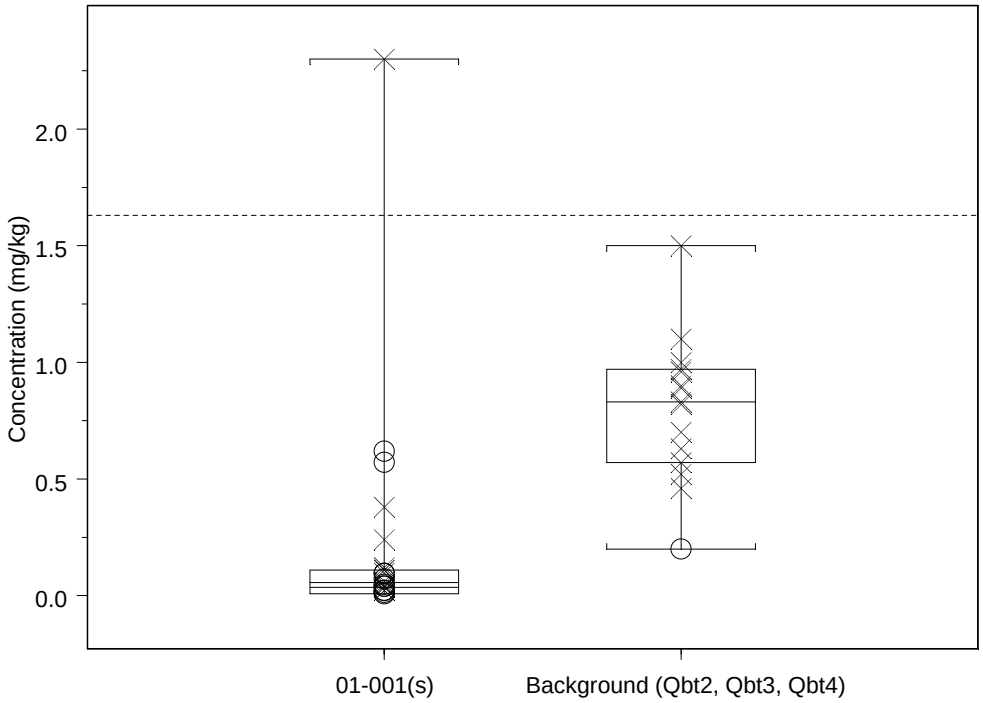


Figure F-3.9-4 Site concentrations of cadmium in tuff at SWMU 01-001(s) compared to background

(× = detect, ○ = nondetect)

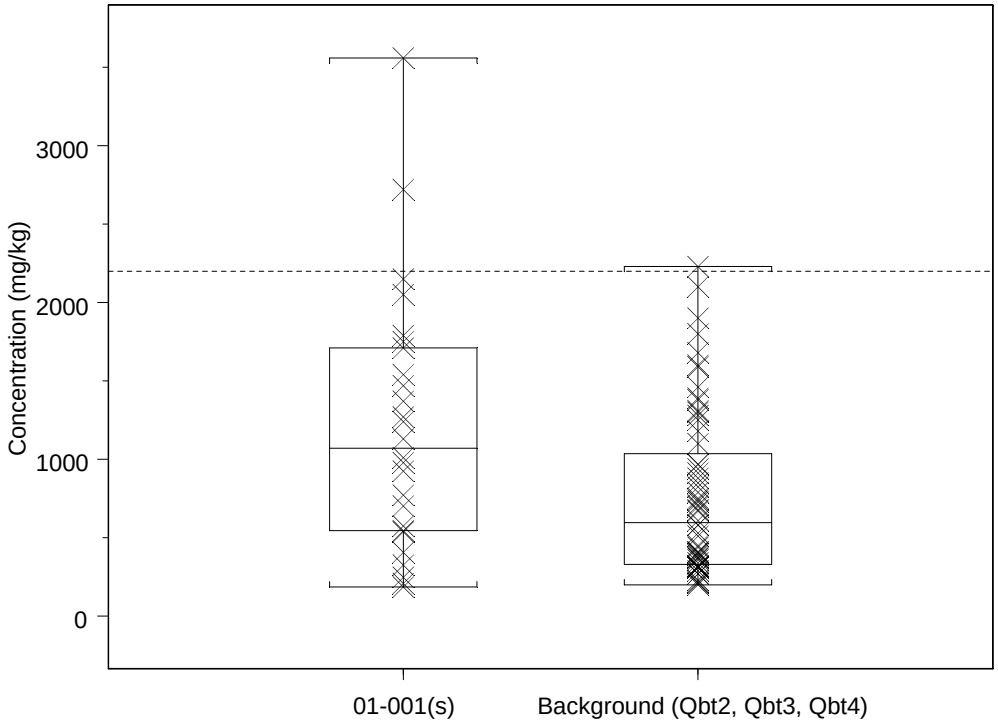


Figure F-3.9-5 Site concentrations of calcium in tuff at SWMU 01-001(s) compared to background

(× = detect, ○ = nondetect)

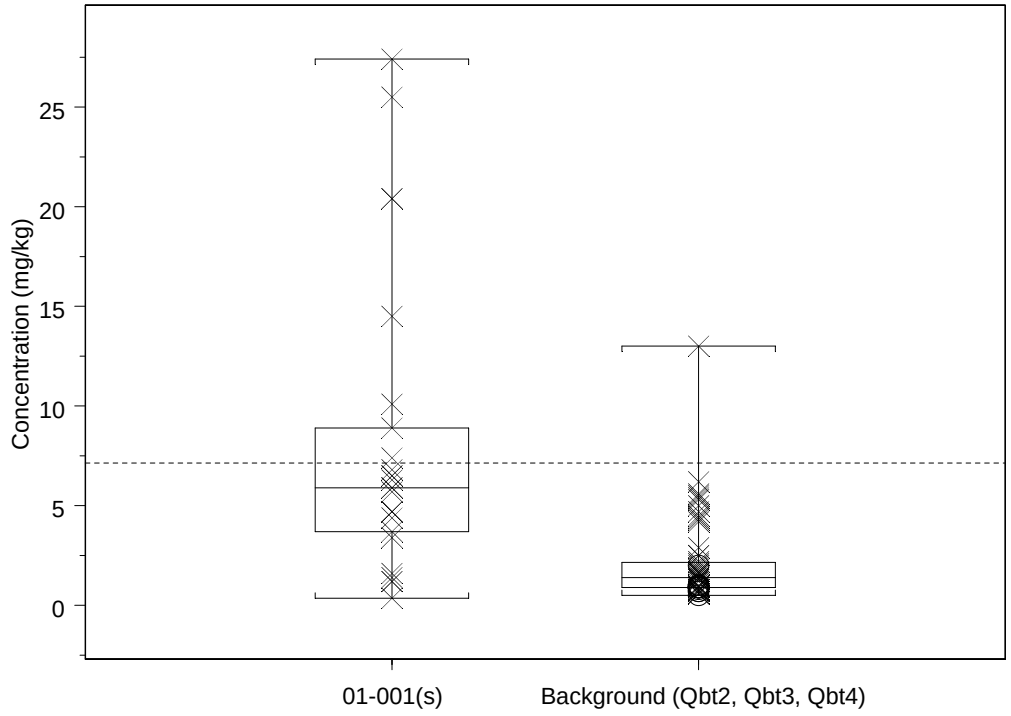


Figure F-3.9-6 Site concentrations of chromium in tuff at SWMU 01-001(s) compared to background

(× = detect, ○ = nondetect)

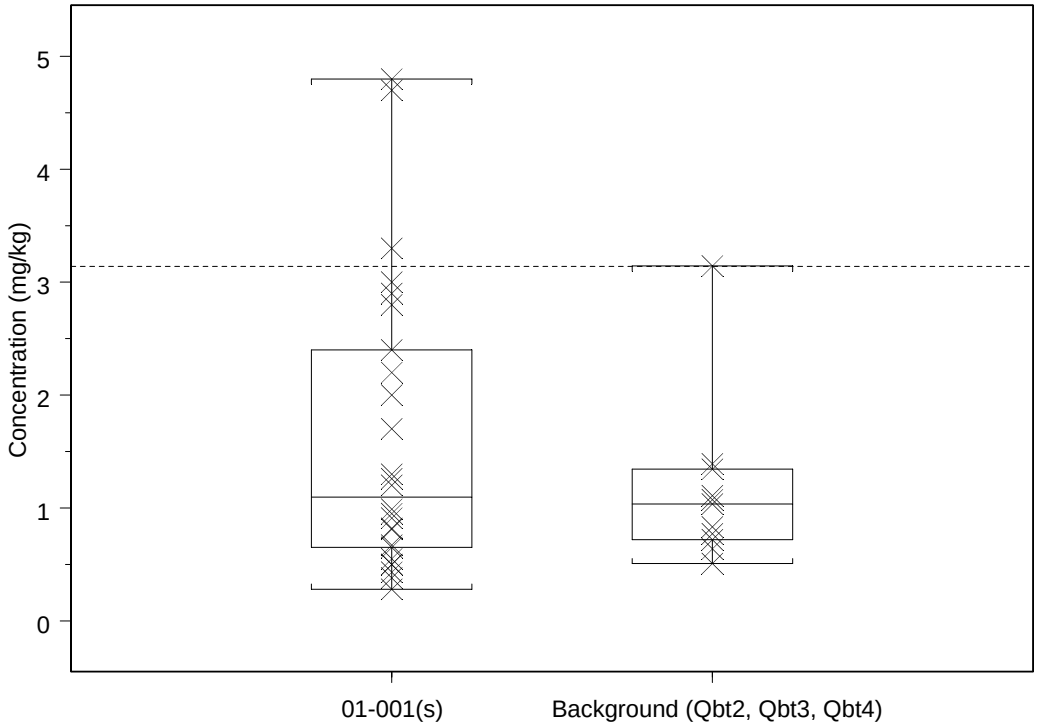


Figure F-3.9-7 Site concentrations of cobalt in tuff at SWMU 01-001(s) compared to background

(× = detect, ○ = nondetect)

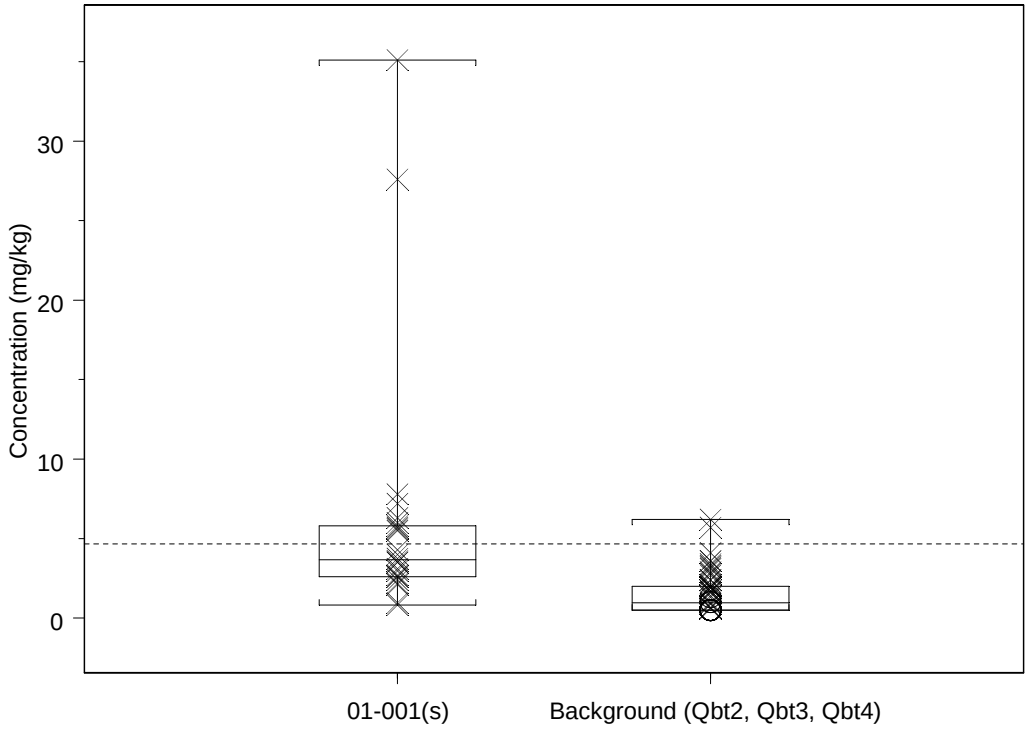


Figure F-3.9-8 Site concentrations of copper in tuff at SWMU 01-001(s) compared to background
(× = detect, ○ = nondetect)

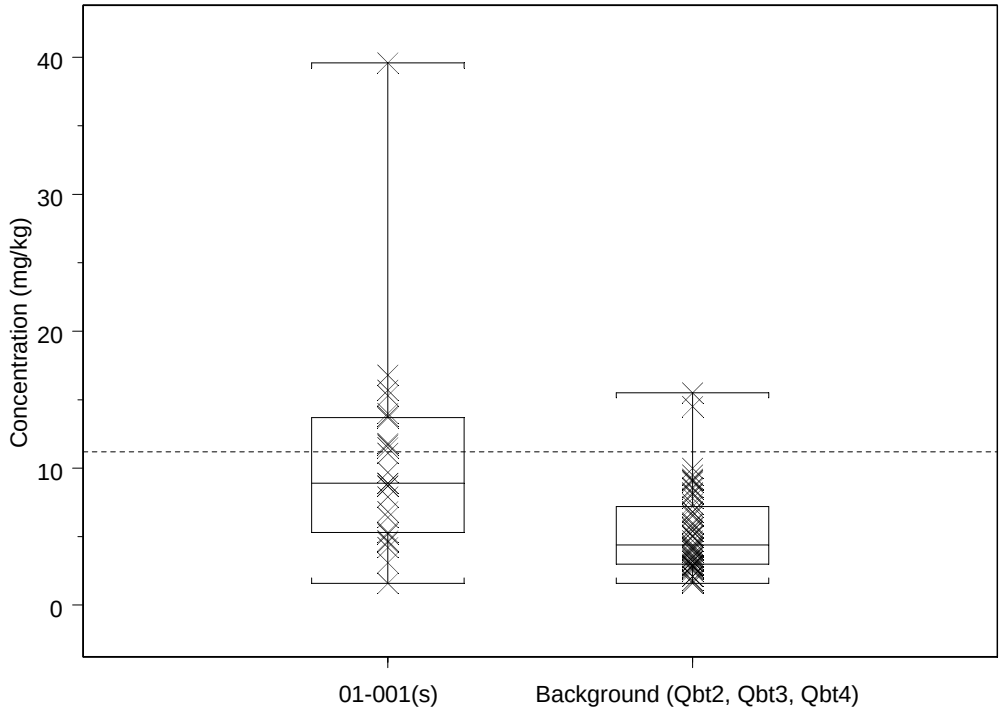


Figure F-3.9-9 Site concentrations of lead in tuff at SWMU 01-001(s) compared to background
(× = detect, ○ = nondetect)

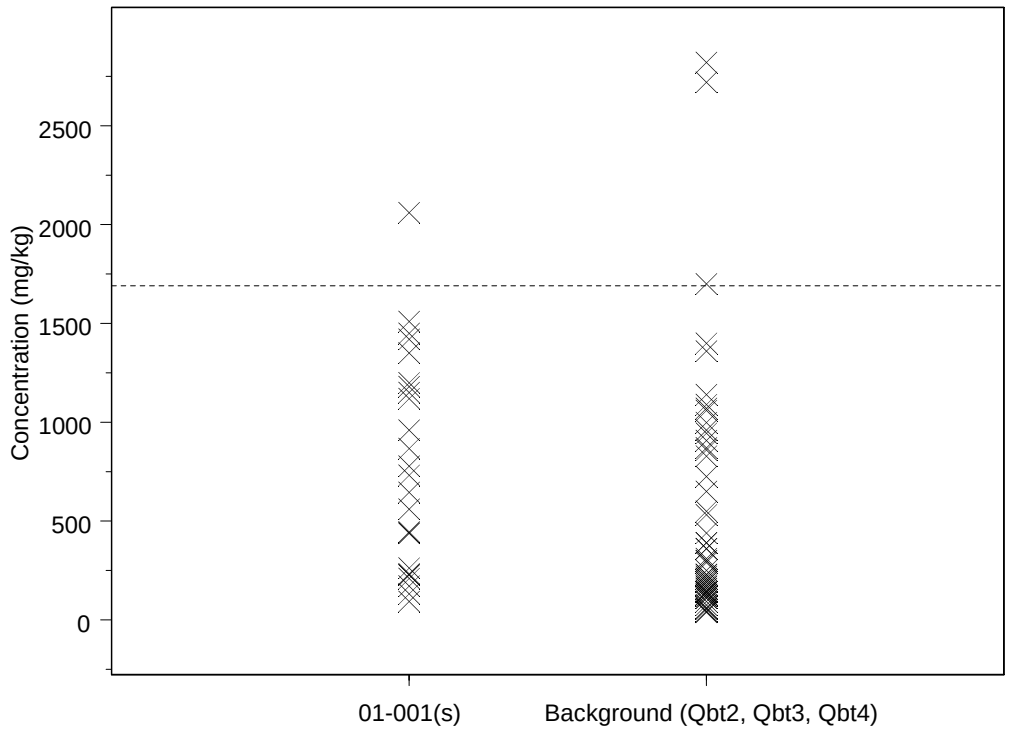


Figure F-3.9-10 Site concentrations of magnesium in tuff at SWMU 01-001(s) compared to background

(× = detect, ○ = nondetect)

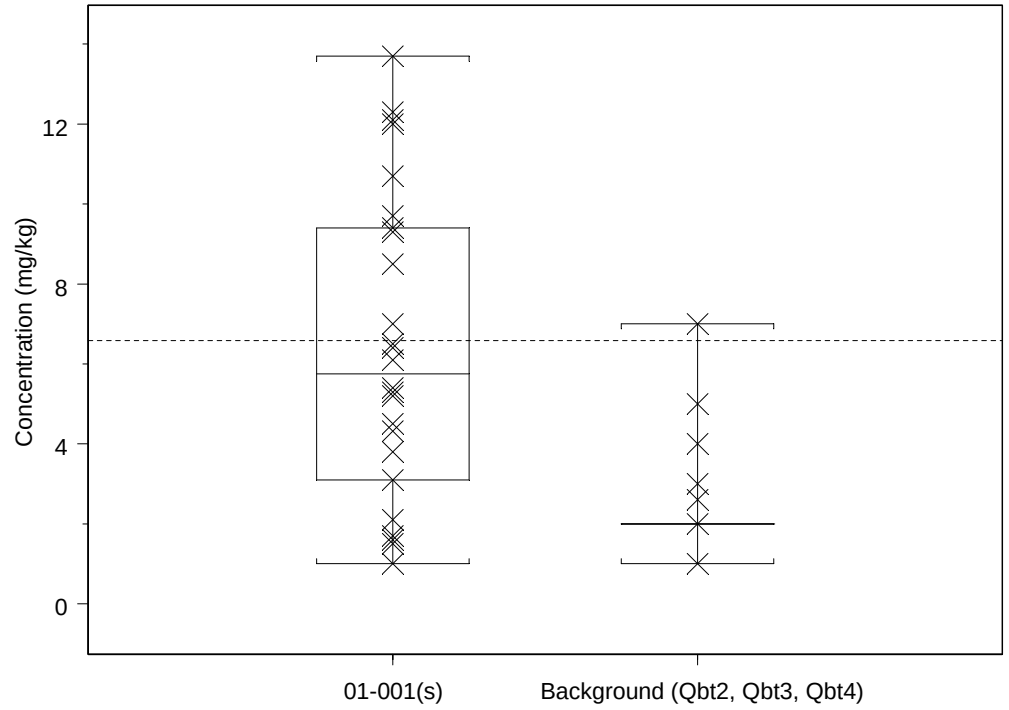


Figure F-3.9-11 Site concentrations of nickel in tuff at SWMU 01-001(s) compared to background

(× = detect, ○ = nondetect)

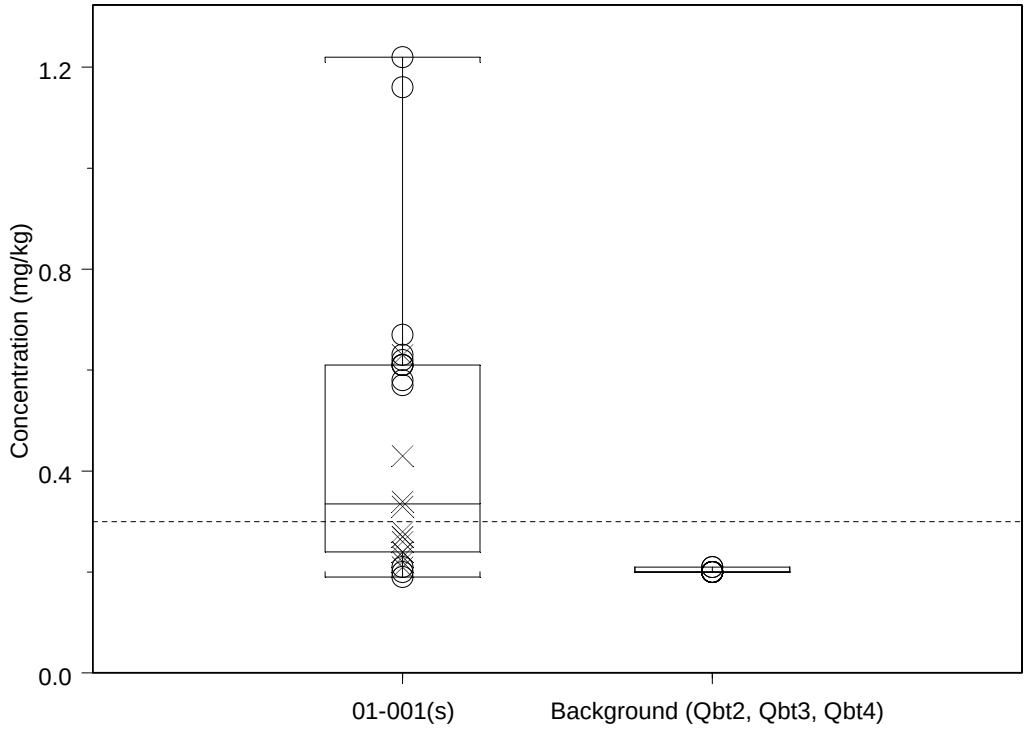


Figure F-3.9-12 Site concentrations of selenium in tuff at SWMU 01-001(s) compared to background

(× = detect, ○ = nondetect)

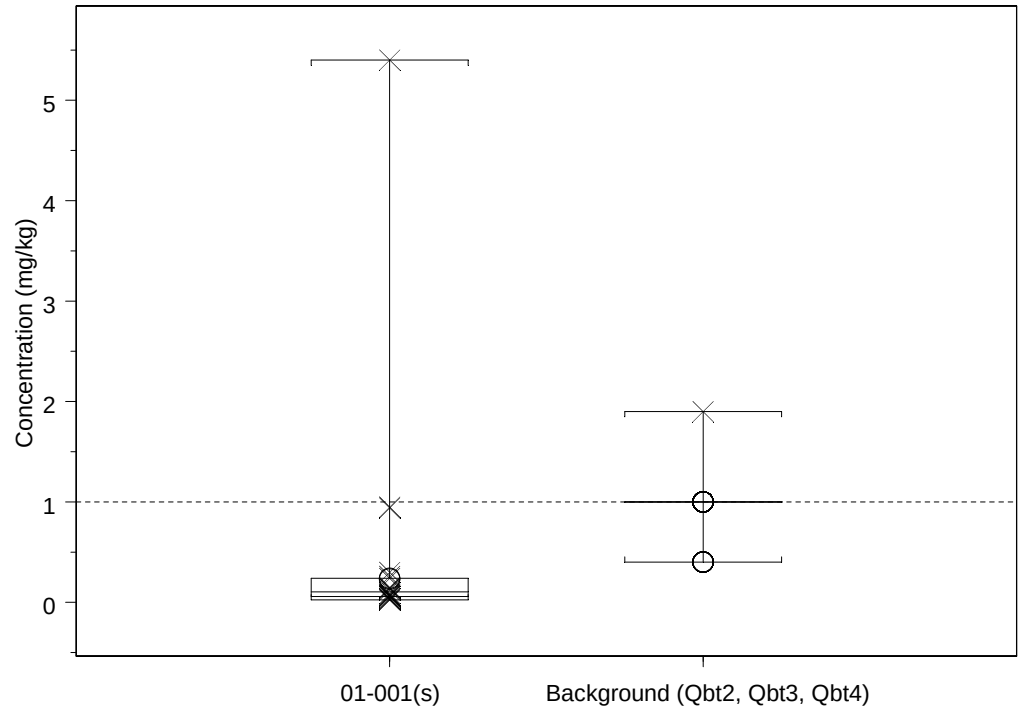


Figure F-3.9-13 Site concentrations of silver in tuff at SWMU 01-001(s) compared to background

(× = detect, ○ = nondetect)

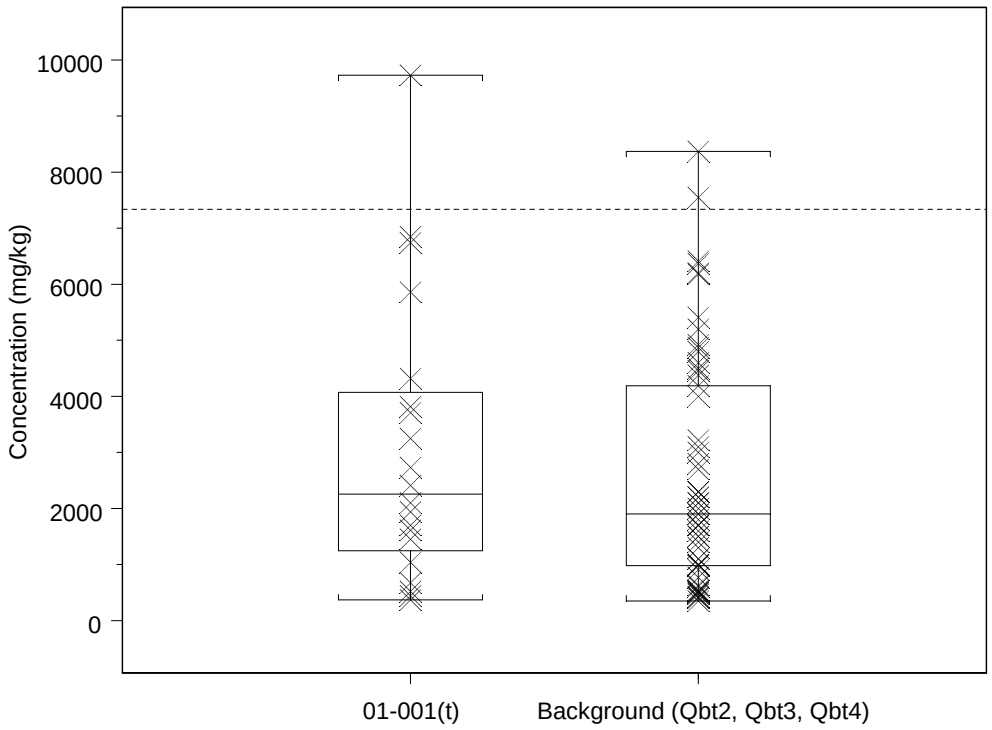


Figure F-3.10-1 Site concentrations of aluminum in tuff at SWMU 01-001(t) compared to background

(× = detect, ○ = nondetect)

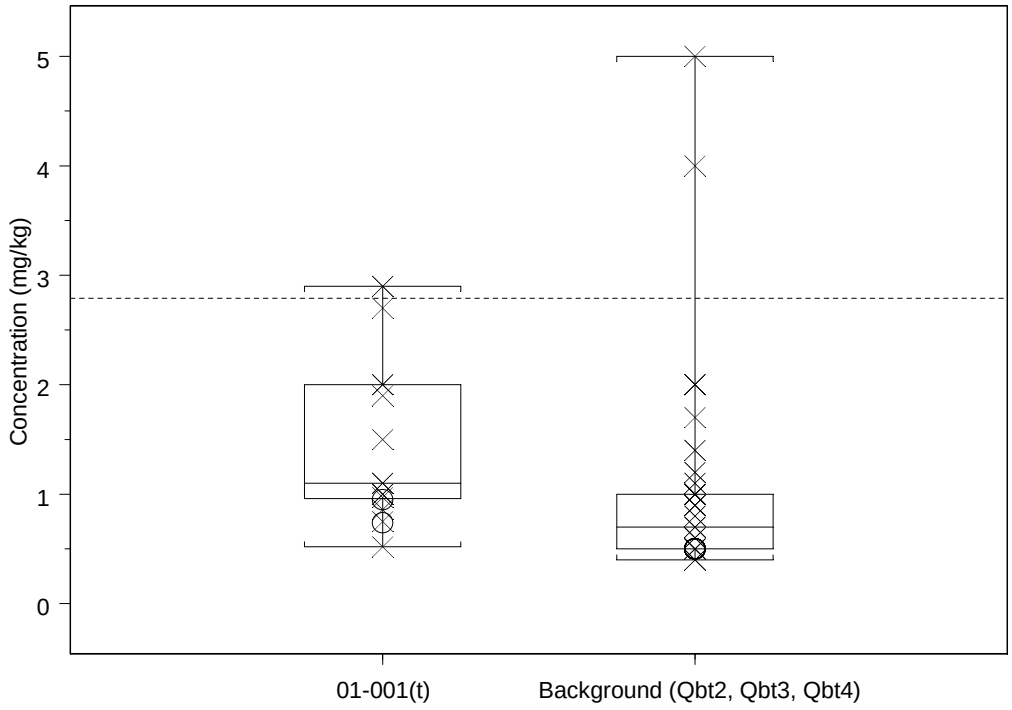


Figure F-3.10-2 Site concentrations of arsenic in tuff at SWMU 01-001(t) compared to background

(× = detect, ○ = nondetect)

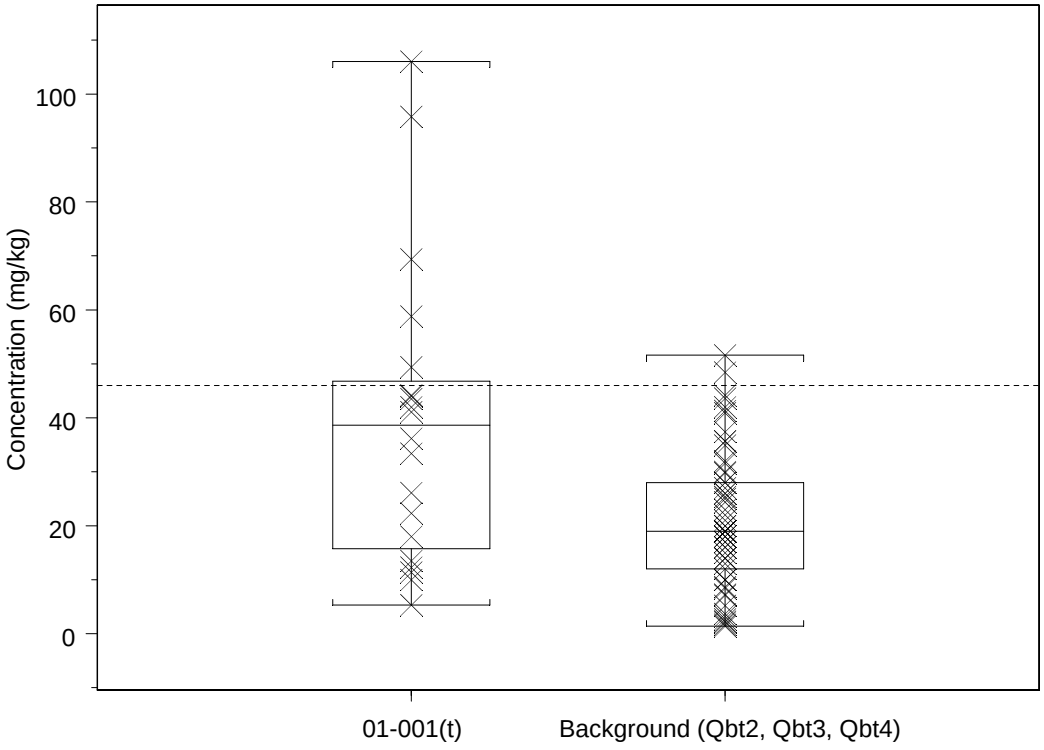


Figure F-3.10-3 Site concentrations of barium in tuff at SWMU 01-001(t) compared to background
(× = detect, ○ = nondetect)

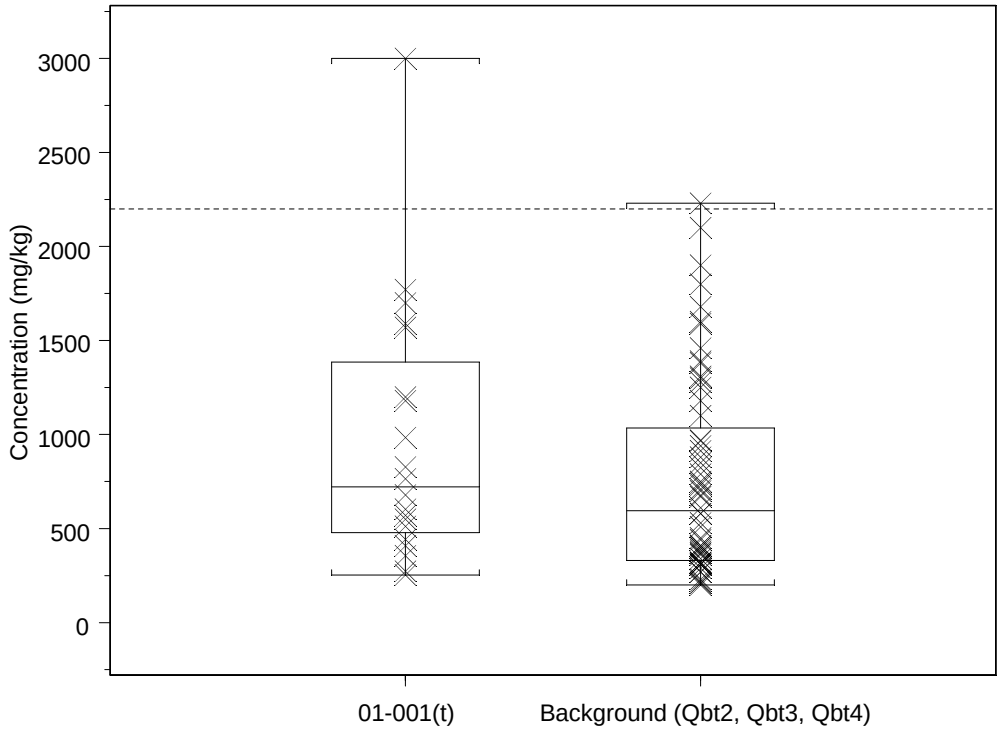


Figure F-3.10-4 Site concentrations of calcium in tuff at SWMU 01-001(t) compared to background
(× = detect, ○ = nondetect)

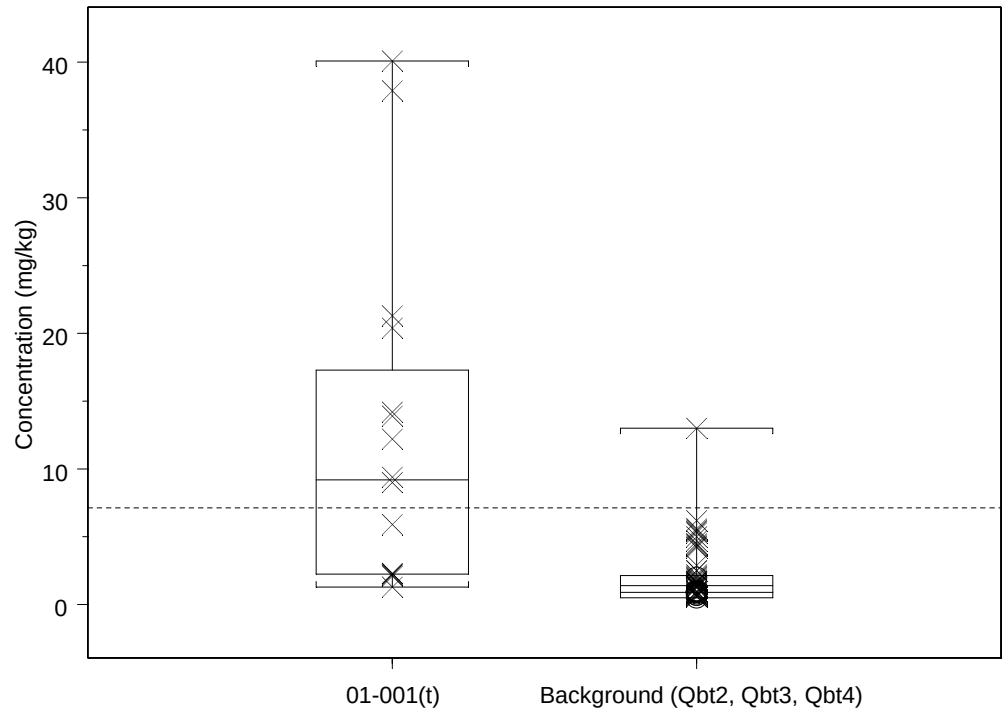


Figure F-3.10-5 Site concentrations of chromium in tuff at SWMU 01-001(t) compared to background

(× = detect, ○ = nondetect)

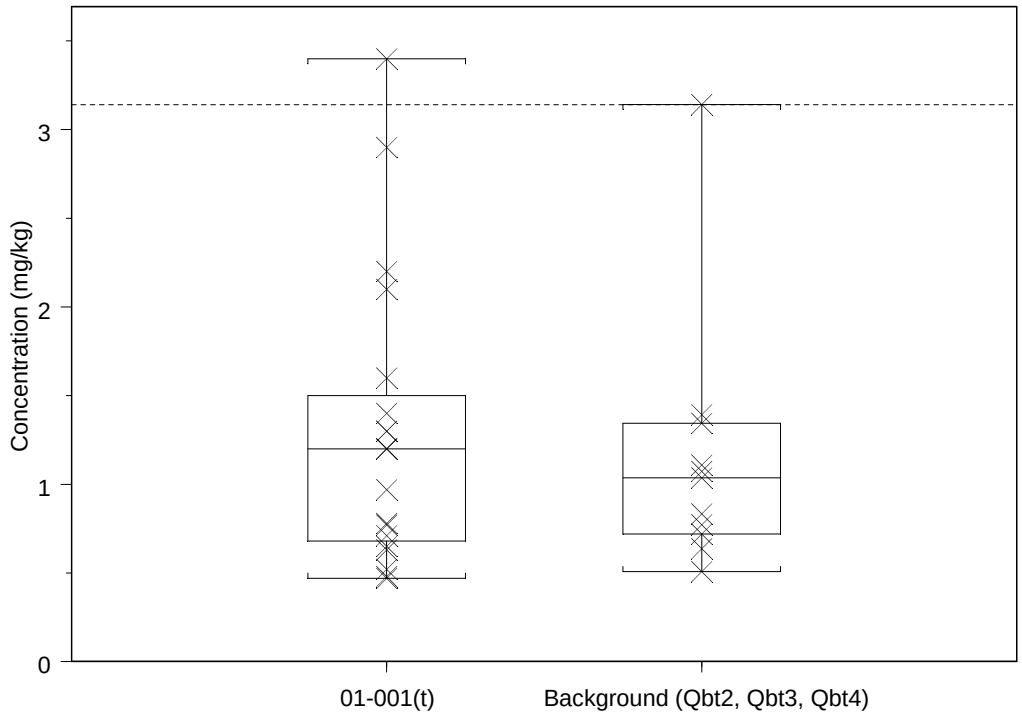


Figure F-3.10-6 Site concentrations of cobalt in tuff at SWMU 01-001(t) compared to background

(× = detect, ○ = nondetect)

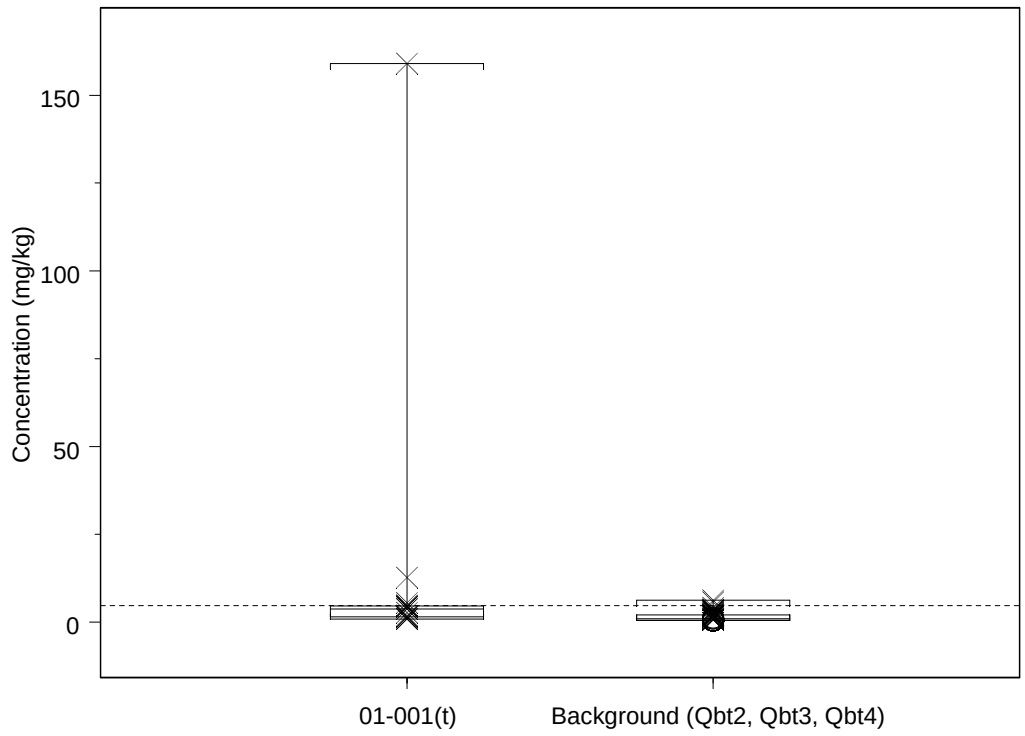


Figure F-3.10-7 Site concentrations of copper in tuff at SWMU 01-001(t) compared to background
(× = detect, ○ = nondetect)

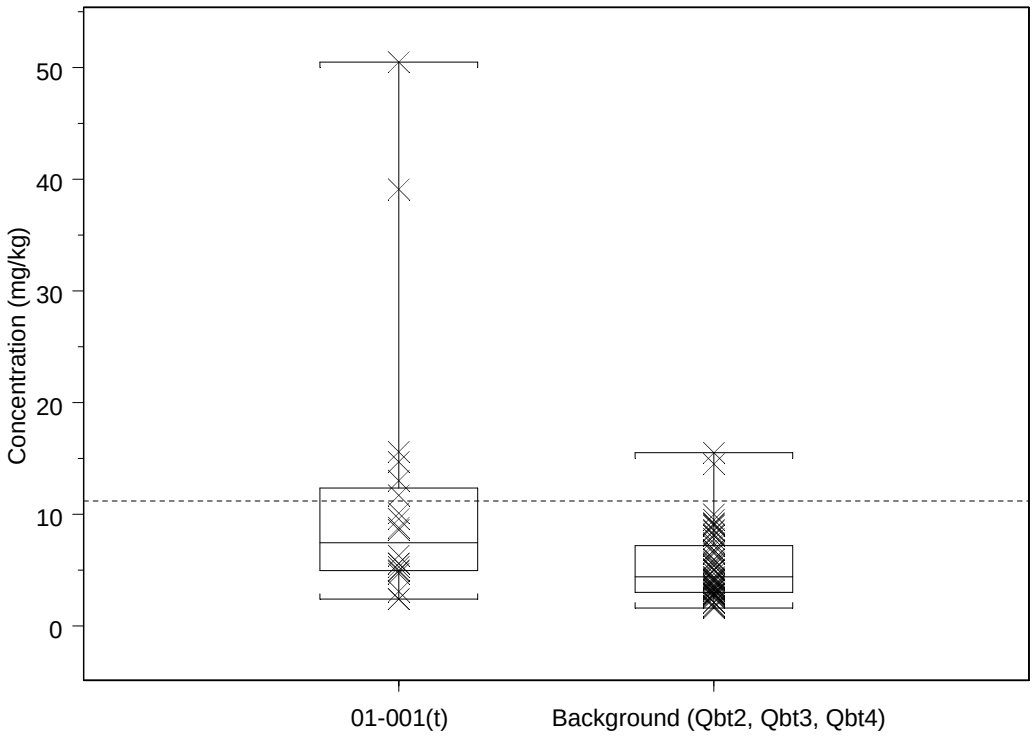


Figure F-3.10-8 Site concentrations of lead in tuff at SWMU 01-001(t) compared to background
(× = detect, ○ = nondetect)

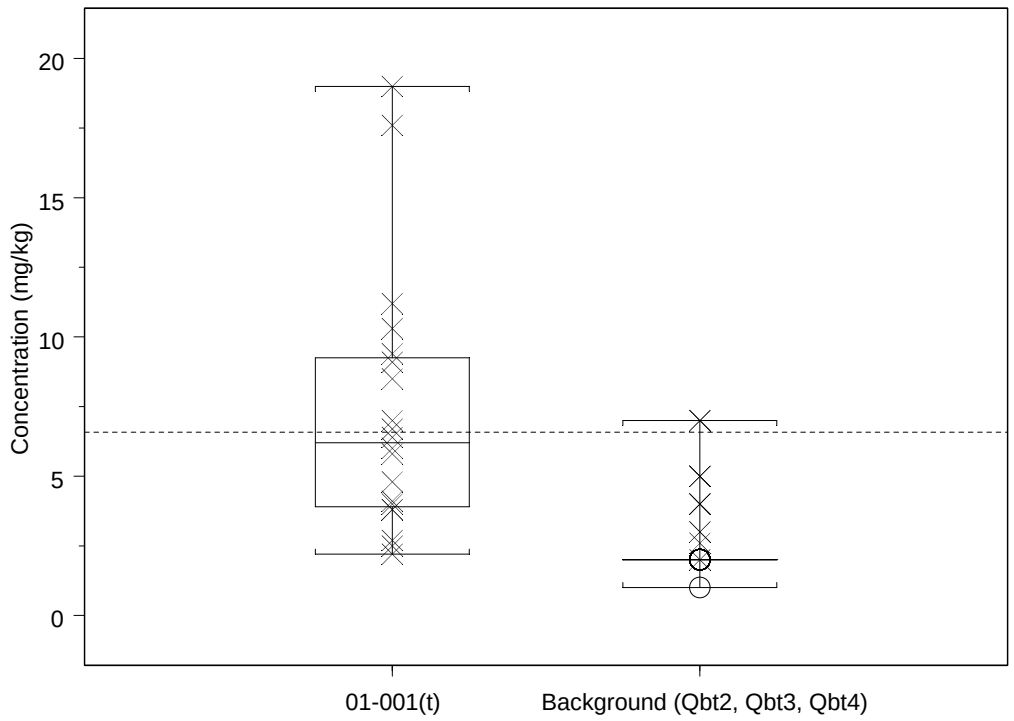


Figure F-3.10-9 Site concentrations of nickel in tuff at SWMU 01-001(t) compared to background
(× = detect, ○ = nondetect)

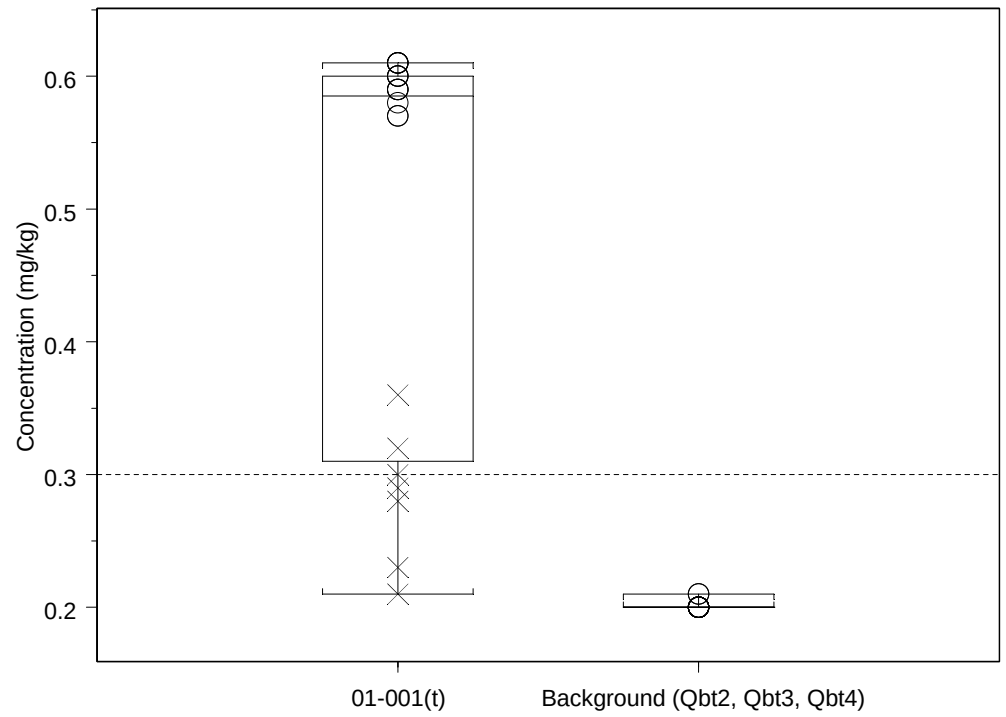


Figure F-3.10-10 Site concentrations of selenium in tuff at SWMU 01-001(t) compared to background
(× = detect, ○ = nondetect)

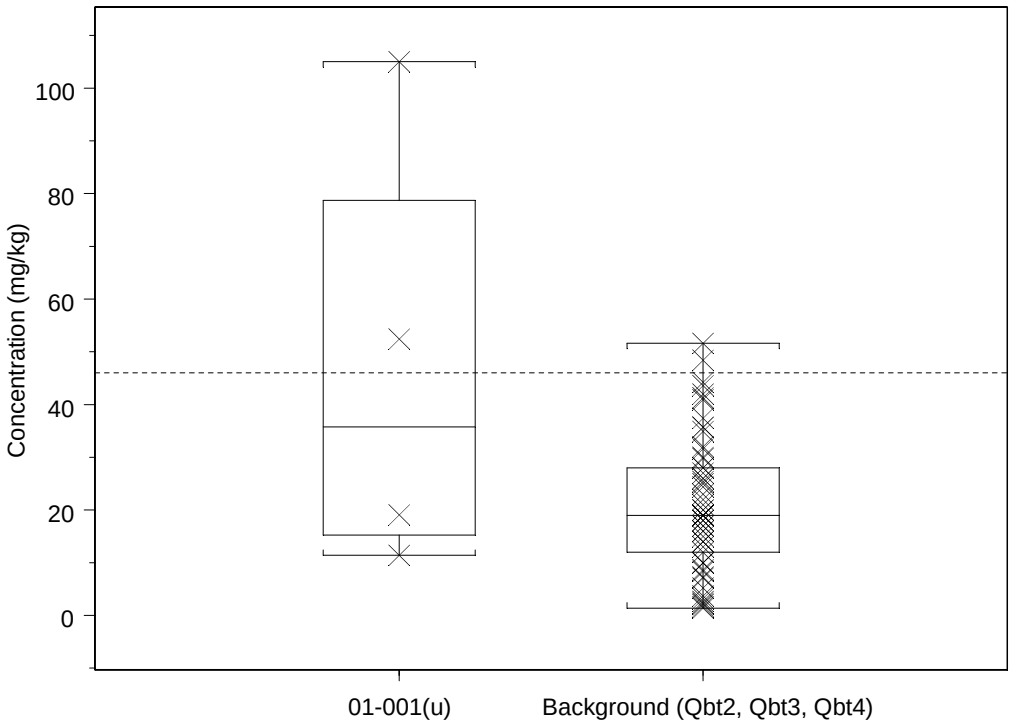


Figure F-3.11-1 Site concentrations of barium in tuff at SWMU 01-001(u) compared to background

(× = detect, ○ = nondetect)

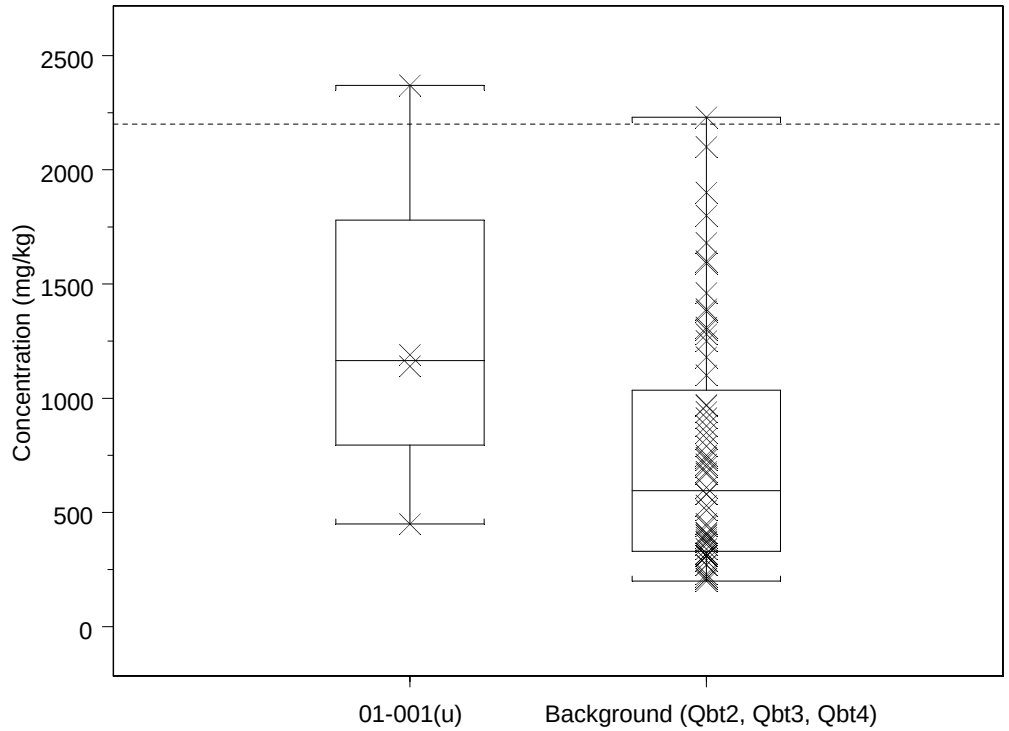


Figure F-3.11-2 Site concentrations of calcium in tuff at SWMU 01-001(u) compared to background

(× = detect, ○ = nondetect)

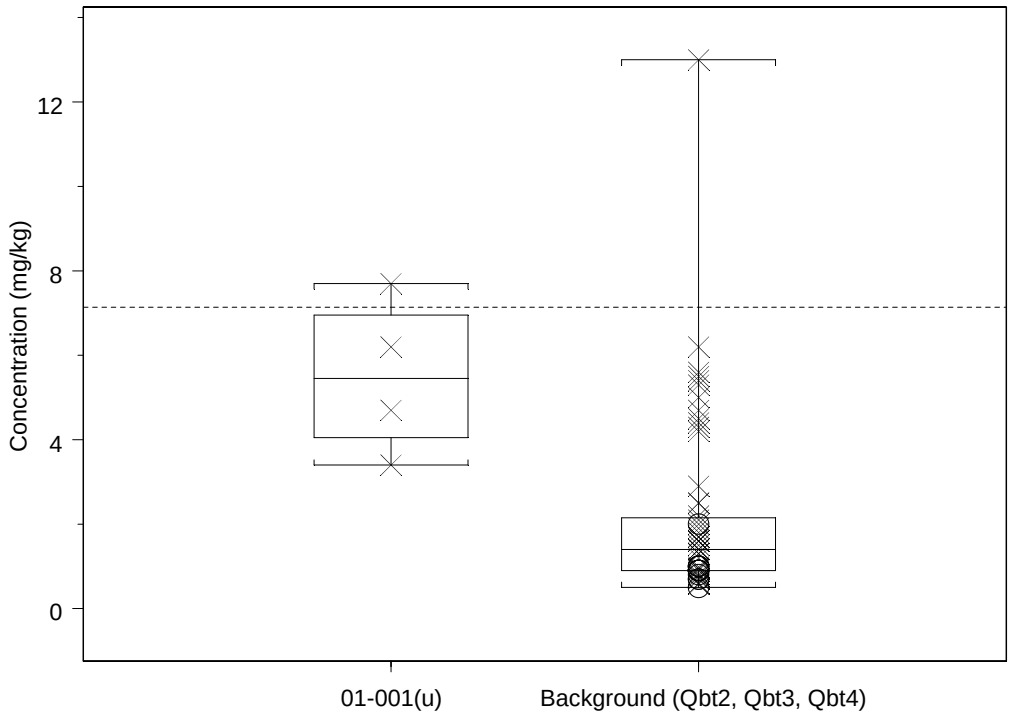


Figure F-3.11-3 Site concentrations of chromium in tuff at SWMU 01-001(u) compared to background

(× = detect, ○ = nondetect)

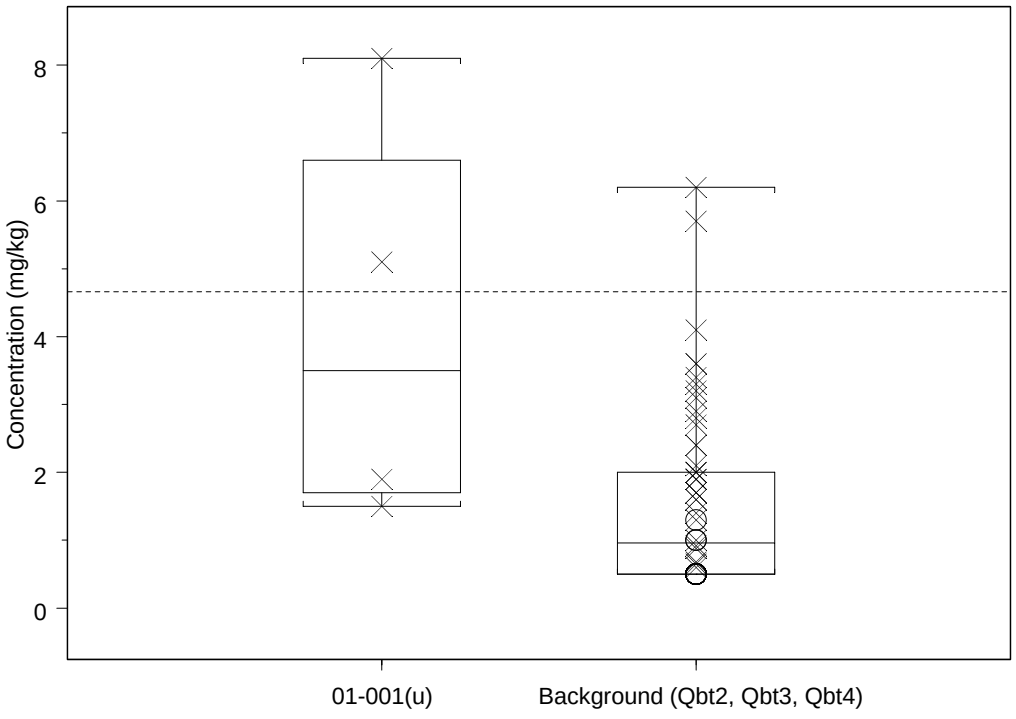


Figure F-3.11-4 Site concentrations of copper in tuff at SWMU 01-001(u) compared to background

(× = detect, ○ = nondetect)

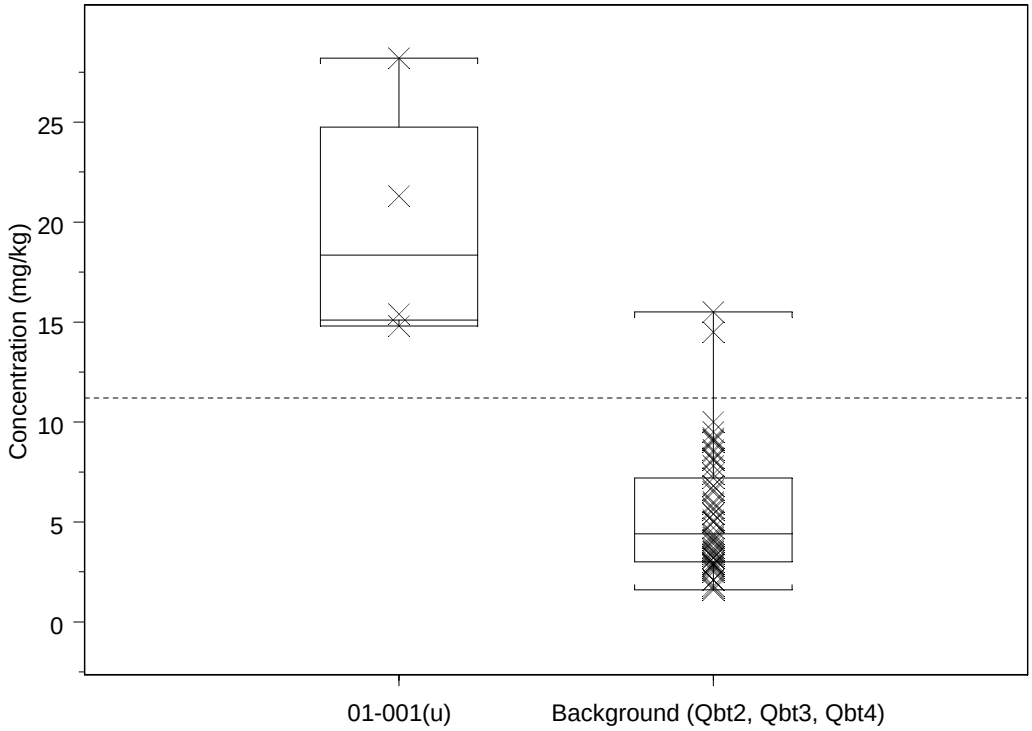


Figure F-3.11-5 Site concentrations of lead in tuff at SWMU 01-001(u) compared to background
(× = detect, ○ = nondetect)

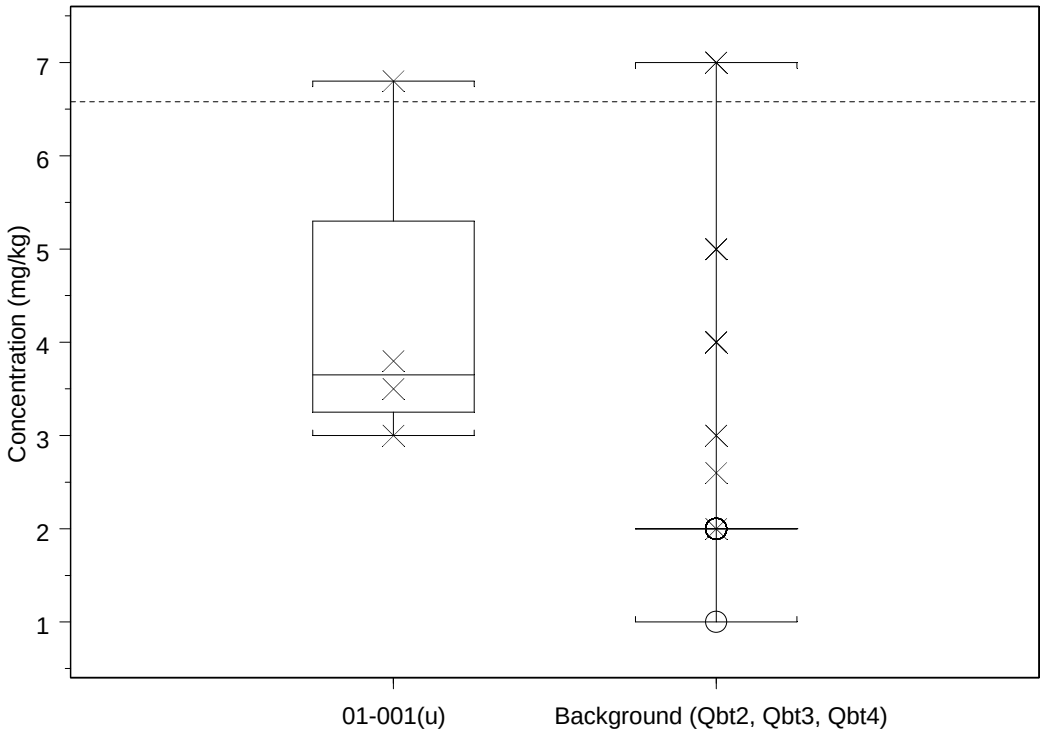


Figure F-3.11-6 Site concentrations of nickel in tuff at SWMU 01-001(u) compared to background
(× = detect, ○ = nondetect)

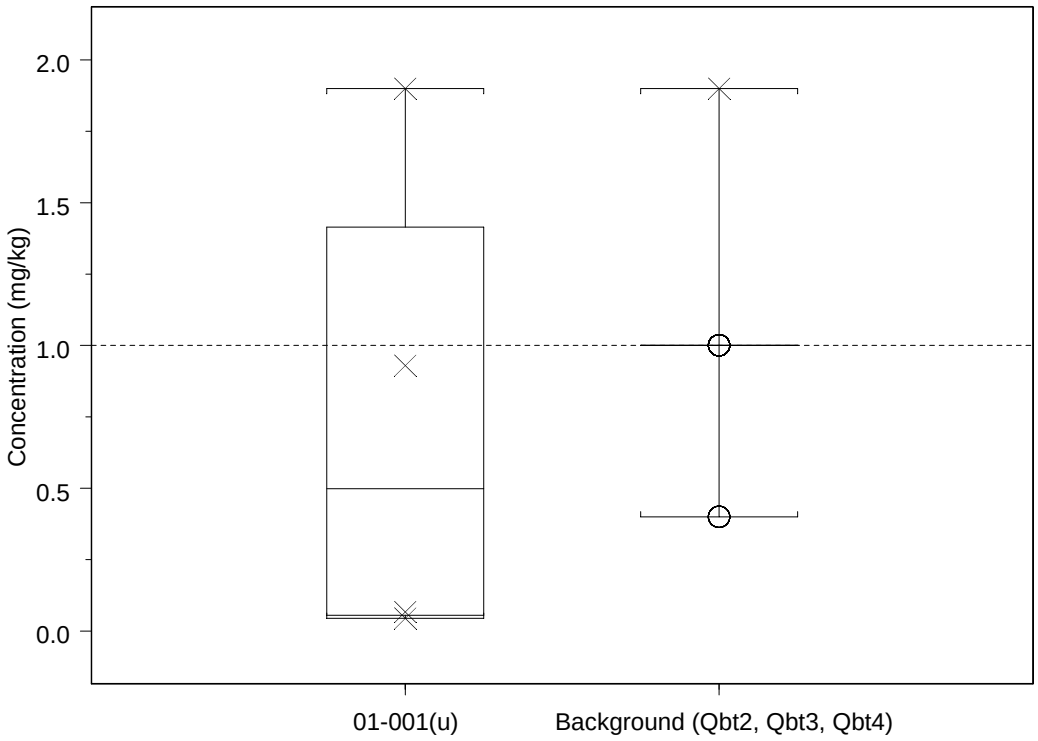


Figure F-3.11-7 Site concentrations of silver in tuff at SWMU 01-001(u) compared to background
(× = detect, ○ = nondetect)

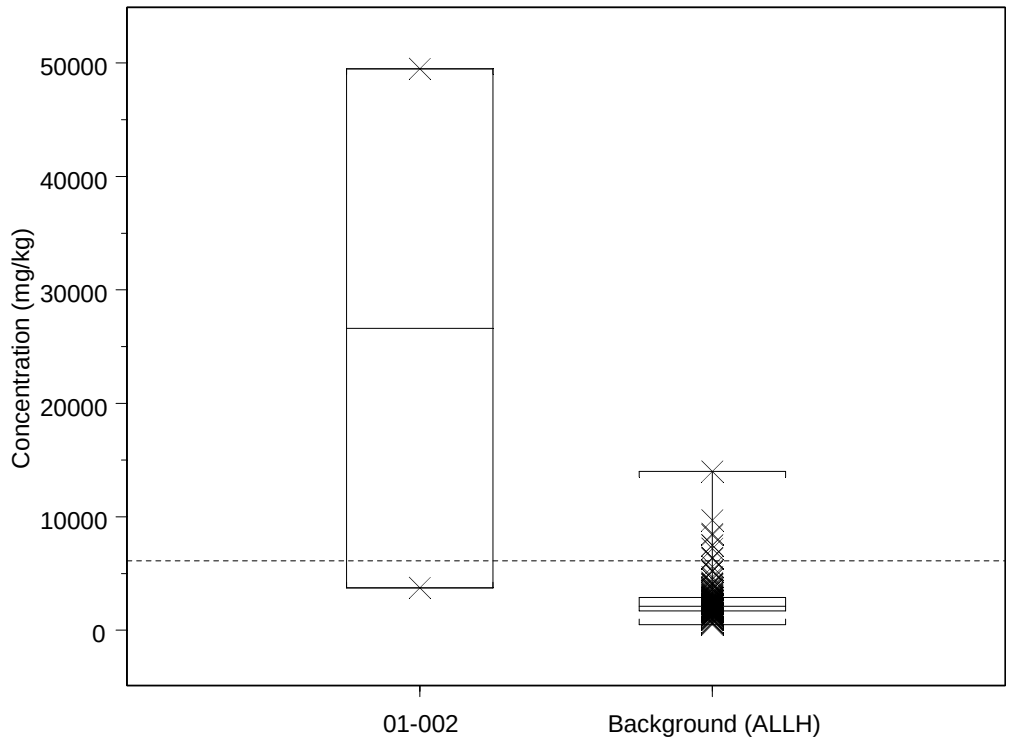


Figure F-3.12-1 Site concentrations of calcium in soil at SWMU 01-002 compared to background
(× = detect, ○ = nondetect)

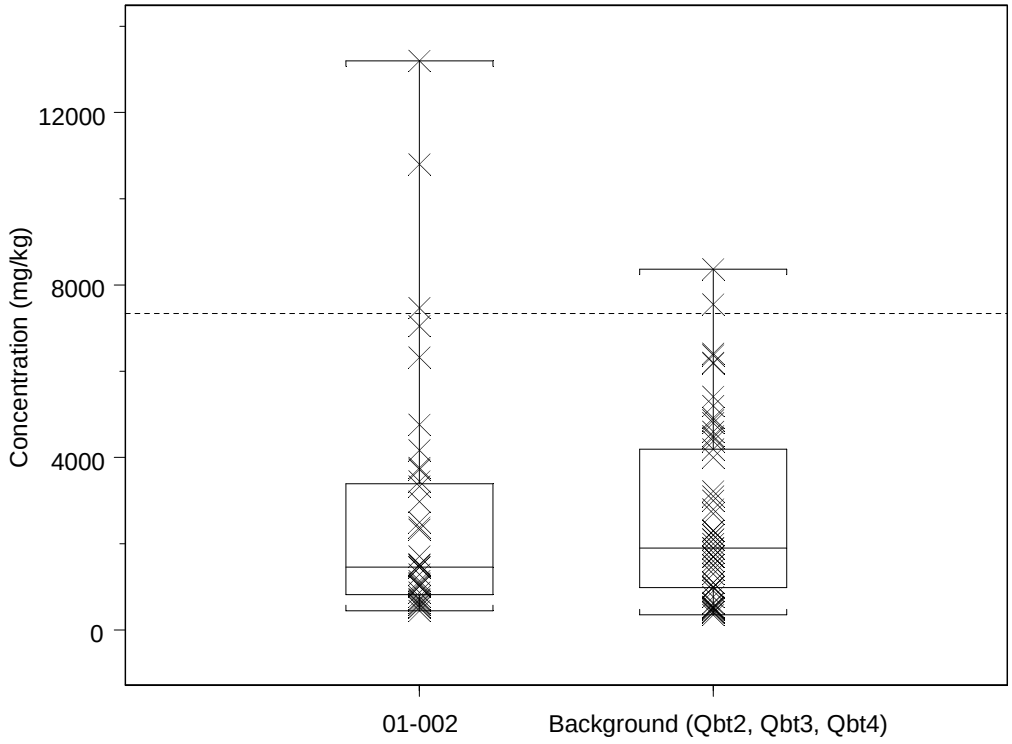


Figure F-3.12-2 Site concentrations of aluminum in tuff at SWMU 01-002 compared to background
(× = detect, ○ = nondetect)

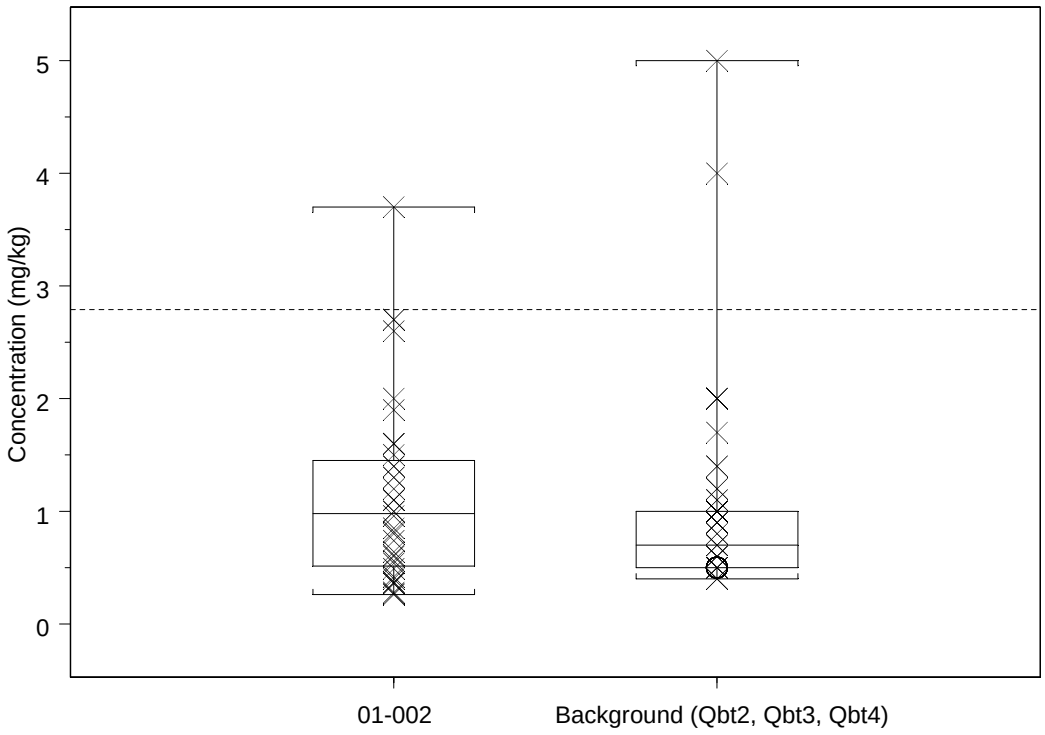


Figure F-3.12-3 Site concentrations of arsenic in tuff at SWMU 01-002 compared to background
(× = detect, ○ = nondetect)

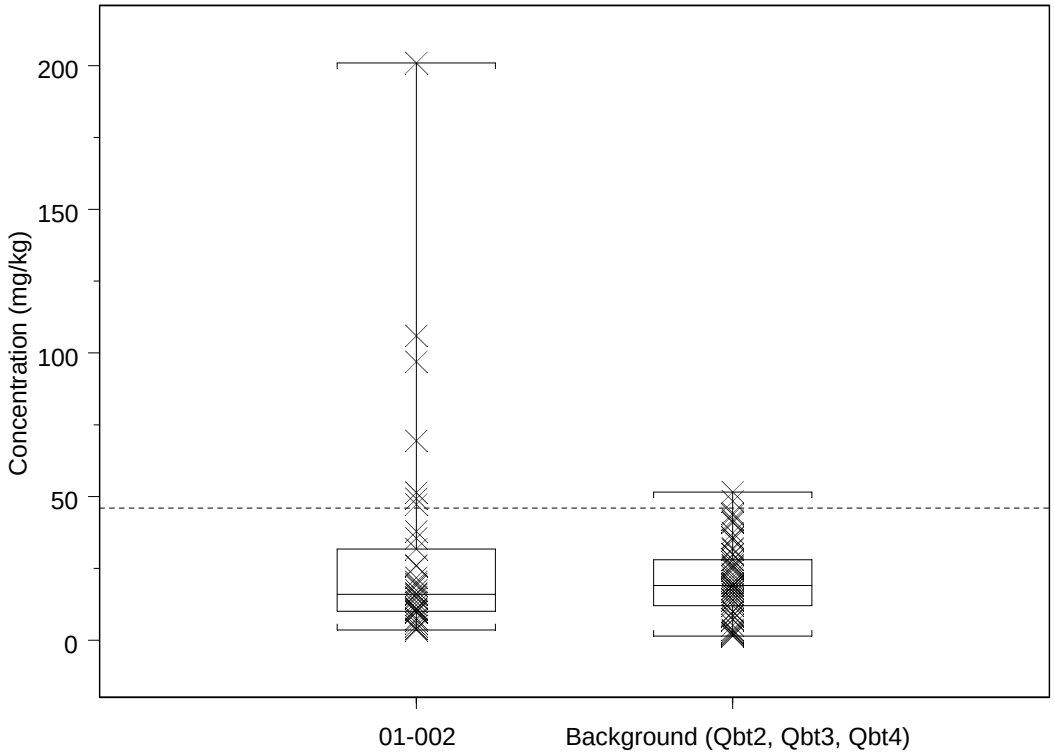


Figure F-3.12-4 Site concentrations of barium in tuff at SWMU 01-002 compared to background
(× = detect, ○ = nondetect)

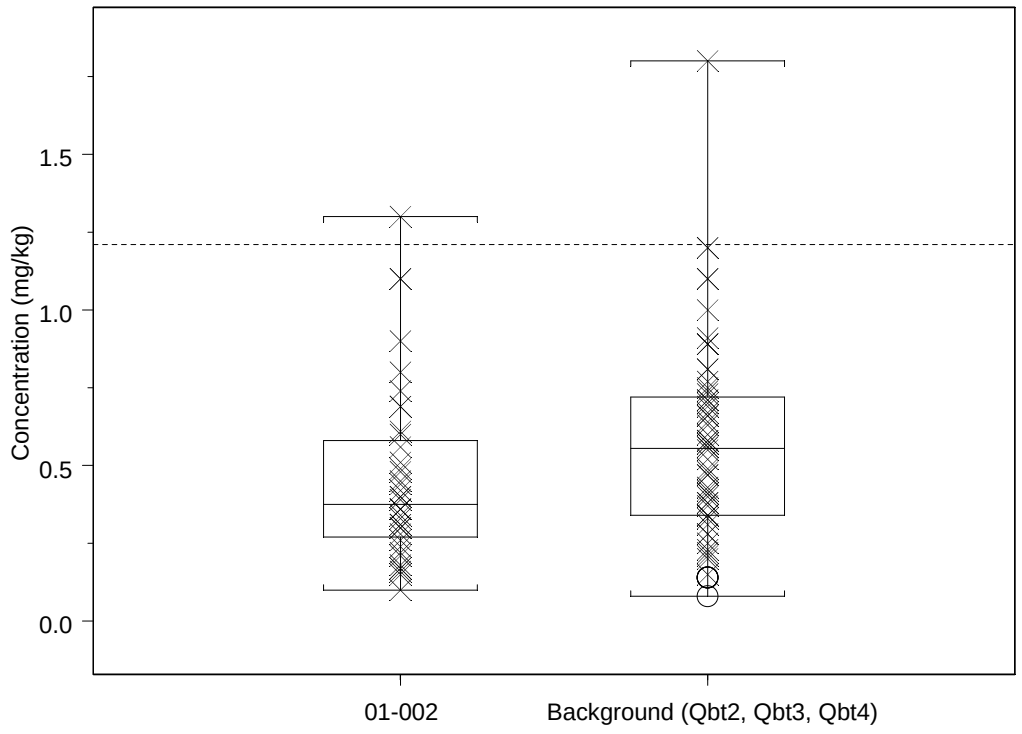


Figure F-3.12-5 Site concentrations of beryllium in tuff at SWMU 01-002 compared to background
(× = detect, ○ = nondetect)

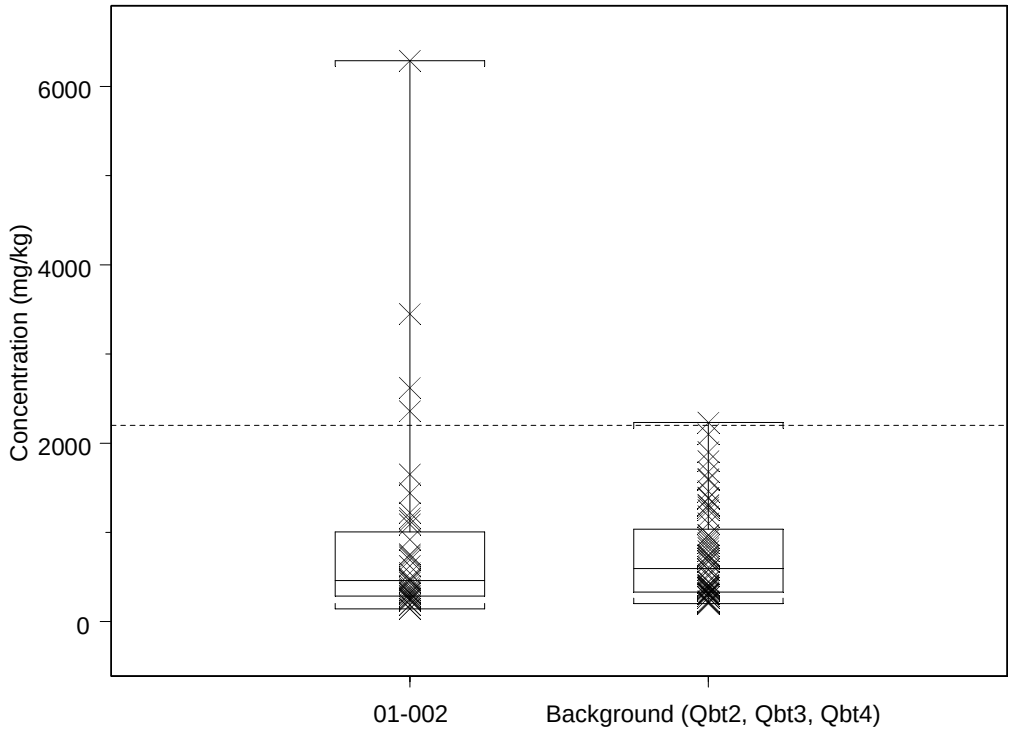


Figure F-3.12-6 Site concentrations of calcium in tuff at SWMU 01-002 compared to background
(× = detect, ○ = nondetect)

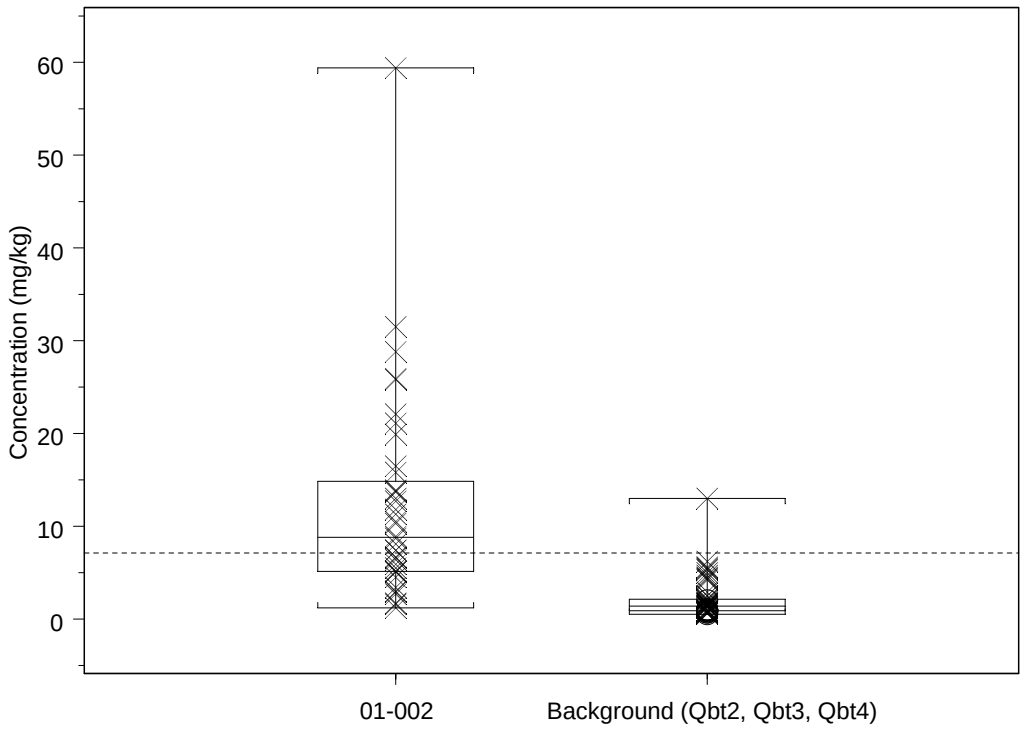


Figure F-3.12-7 Site concentrations of chromium in tuff at SWMU 01-002 compared to background
(× = detect, ○ = nondetect)

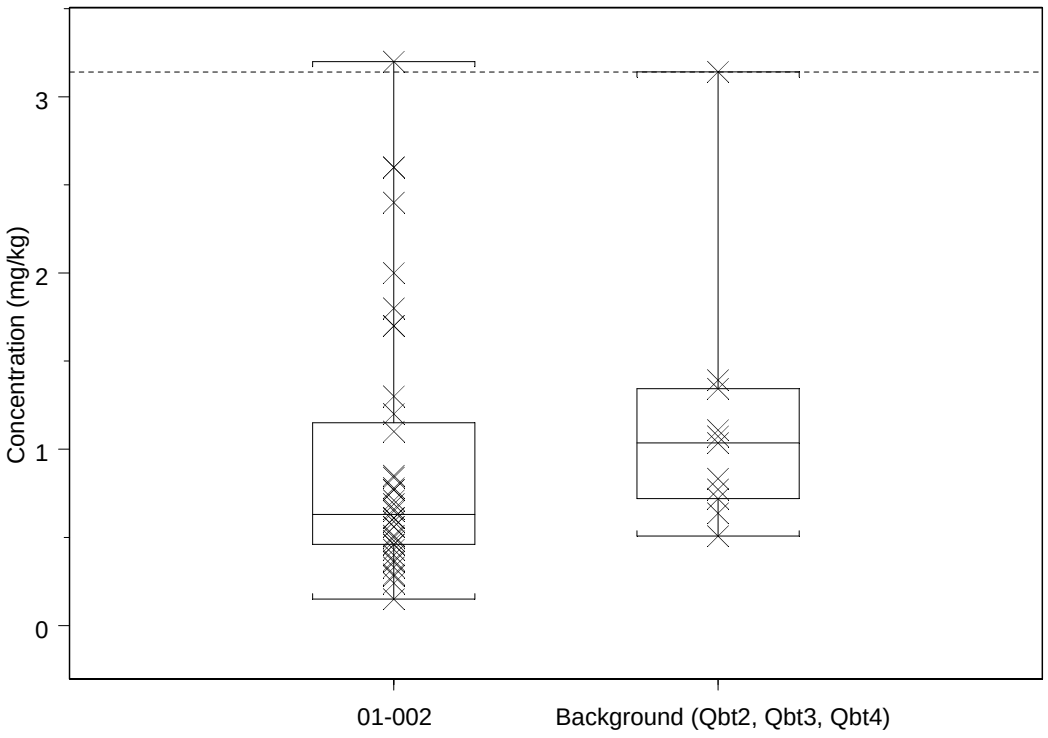


Figure F-3.12-8 Site concentrations of cobalt in tuff at SWMU 01-002 compared to background
(× = detect, ○ = nondetect)

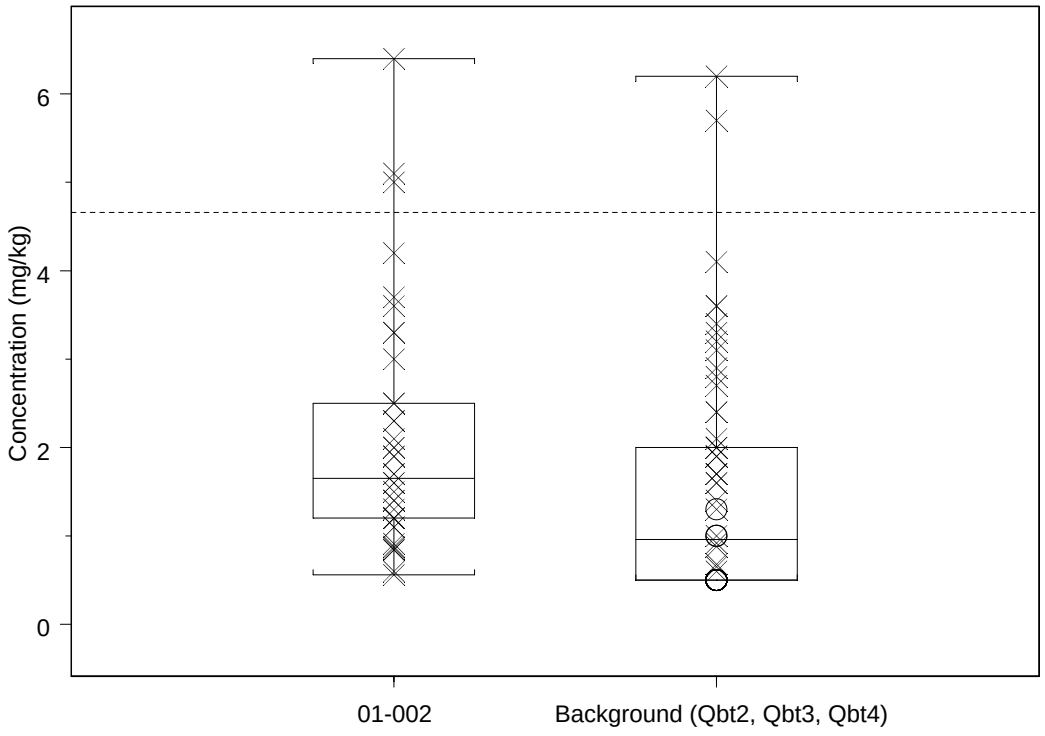


Figure F-3.12-9 Site concentrations of copper in tuff at SWMU 01-002 compared to background
(× = detect, ○ = nondetect)

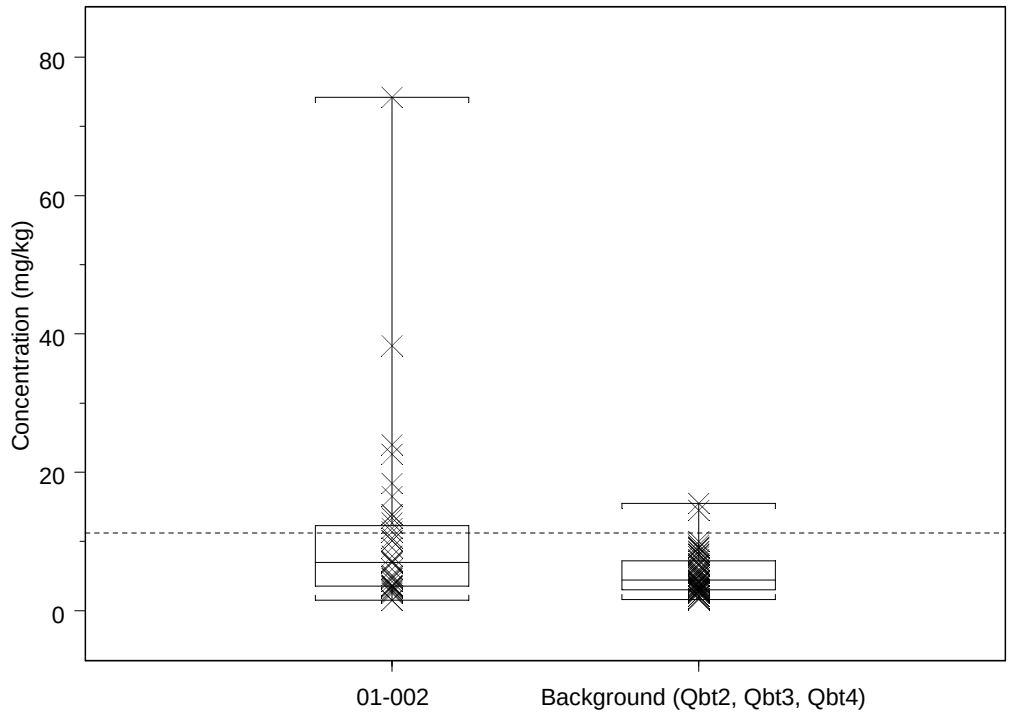


Figure F-3.12-10 Site concentrations of lead in tuff at SWMU 01-002 compared to background
(× = detect, ○ = nondetect)

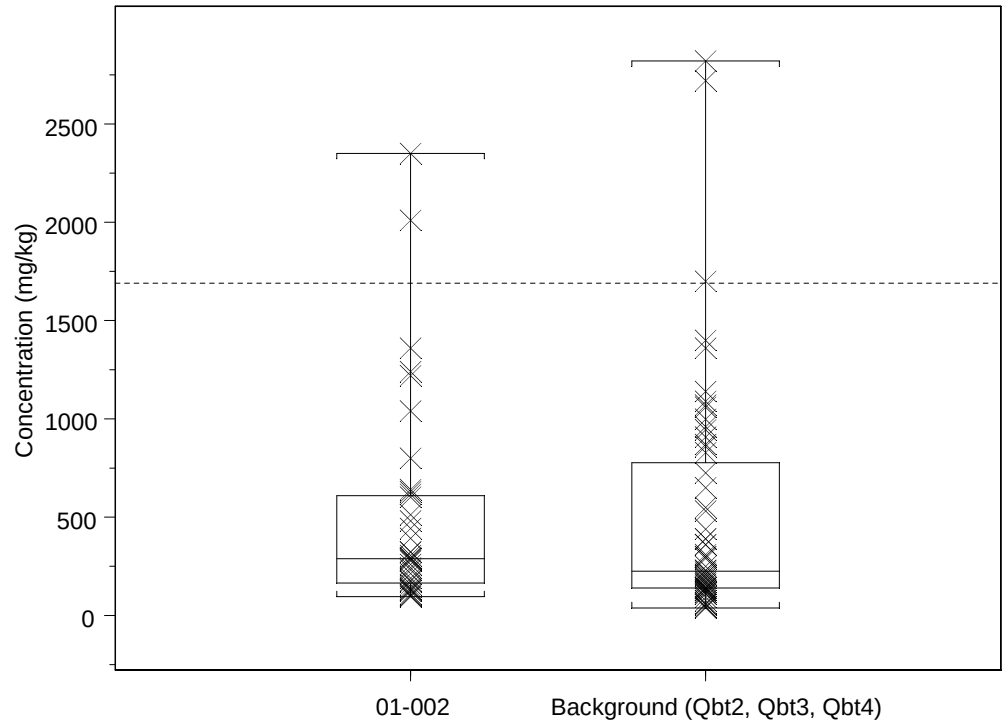


Figure F-3.12-11 Site concentrations of magnesium in tuff at SWMU 01-002 compared to background
(× = detect, ○ = nondetect)

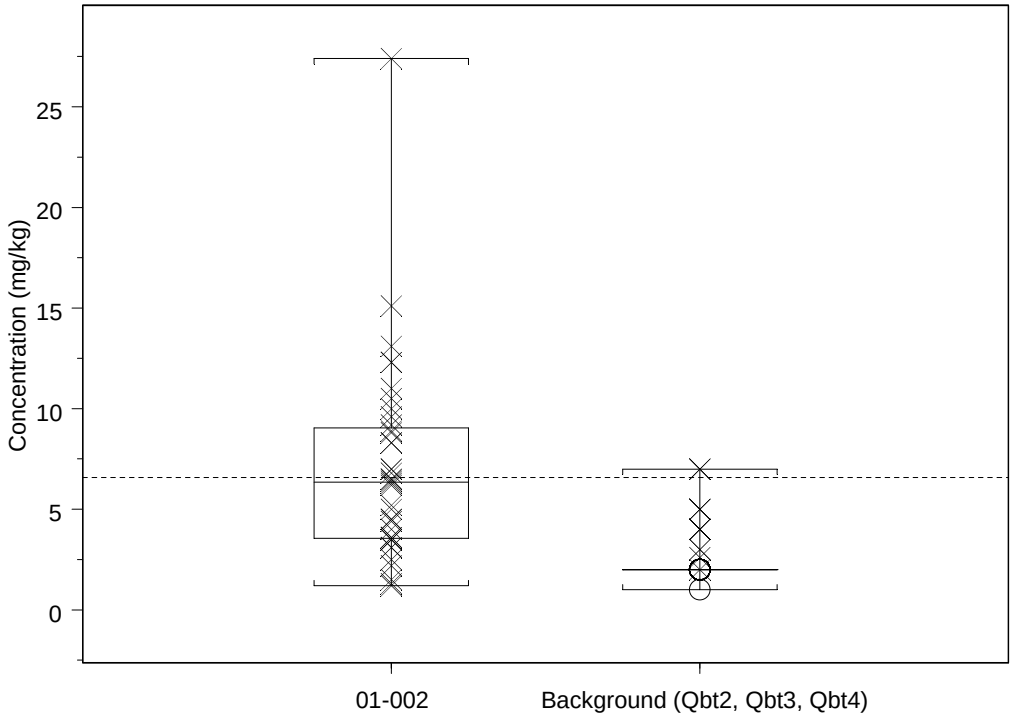


Figure F-3.12-12 Site concentrations of nickel in tuff at SWMU 01-002 compared to background
(× = detect, ○ = nondetect)

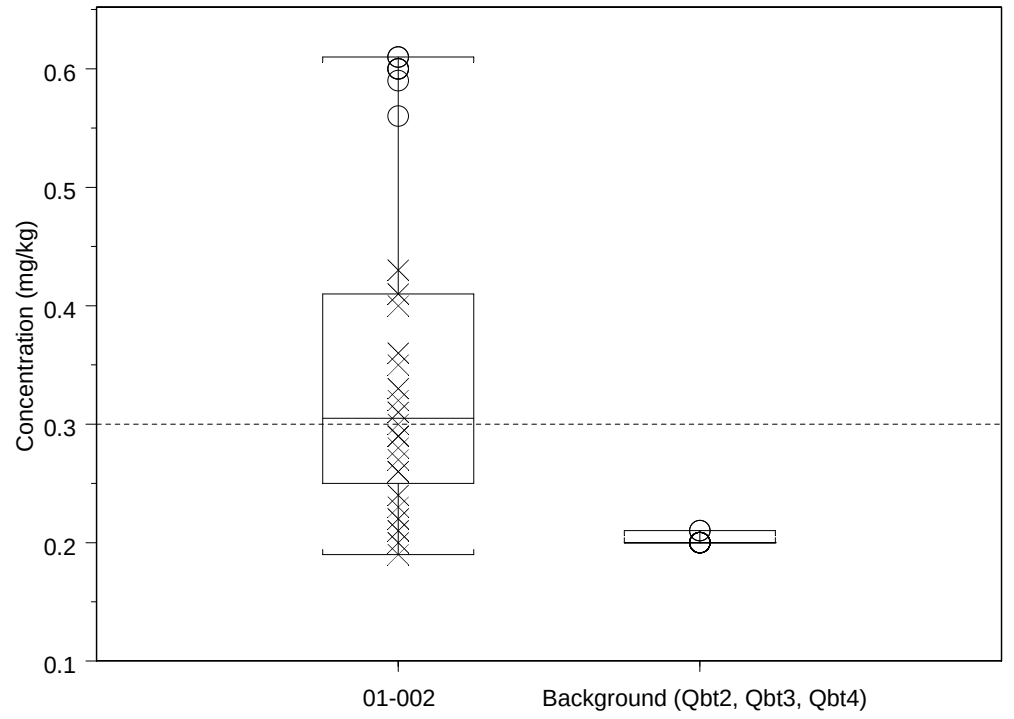


Figure F-3.12-13 Site concentrations of selenium in tuff at SWMU 01-002 compared to background
(× = detect, ○ = nondetect)

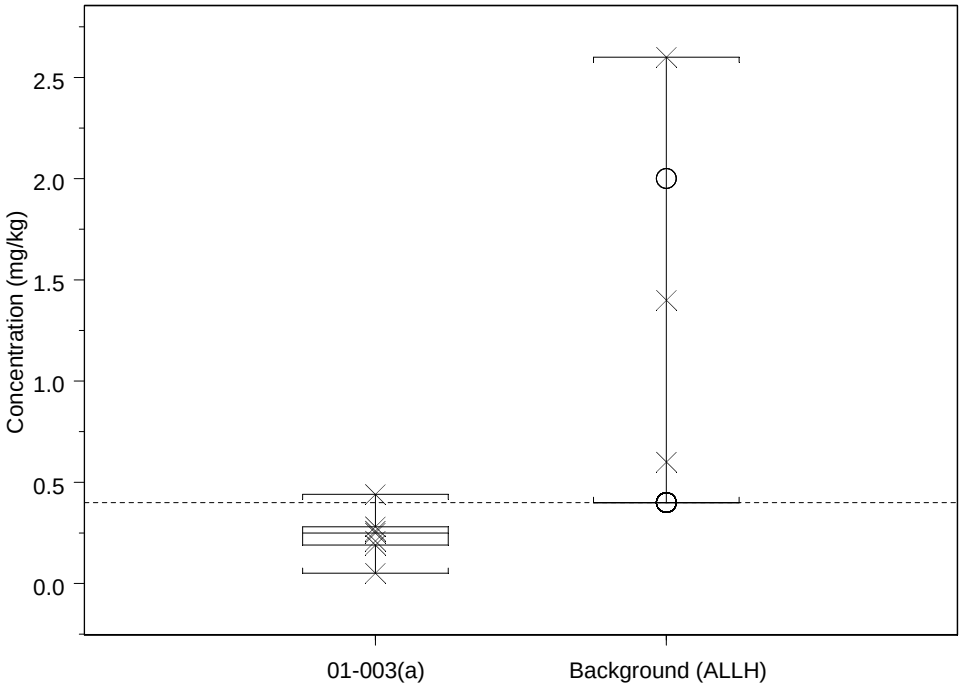


Figure F-3.13-1 Site concentrations of cadmium in soil at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

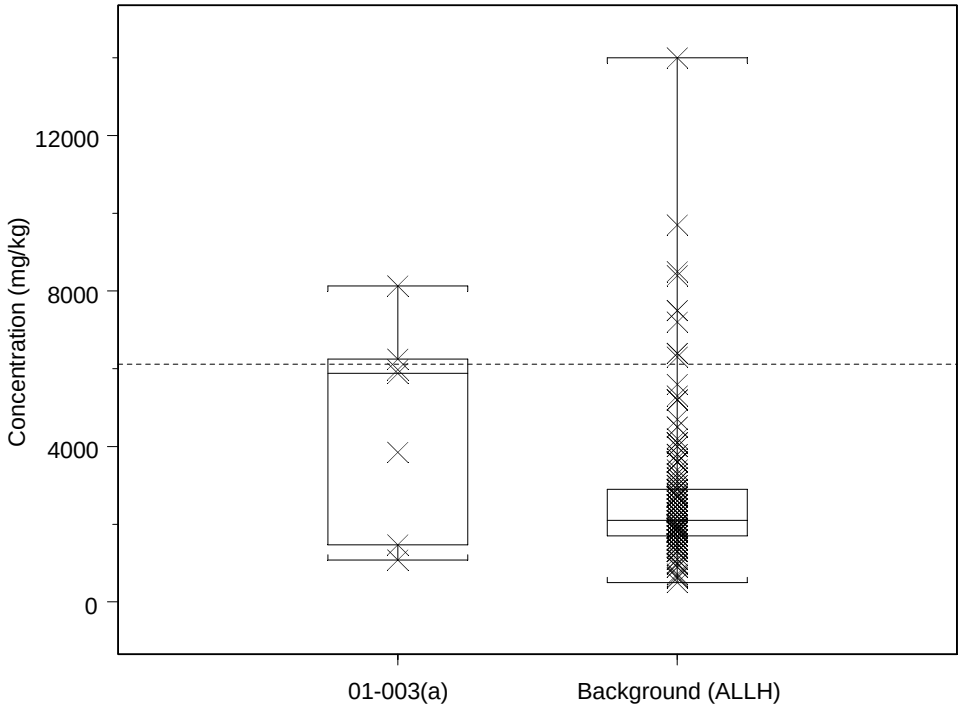


Figure F-3.13-2 Site concentrations of calcium in soil at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

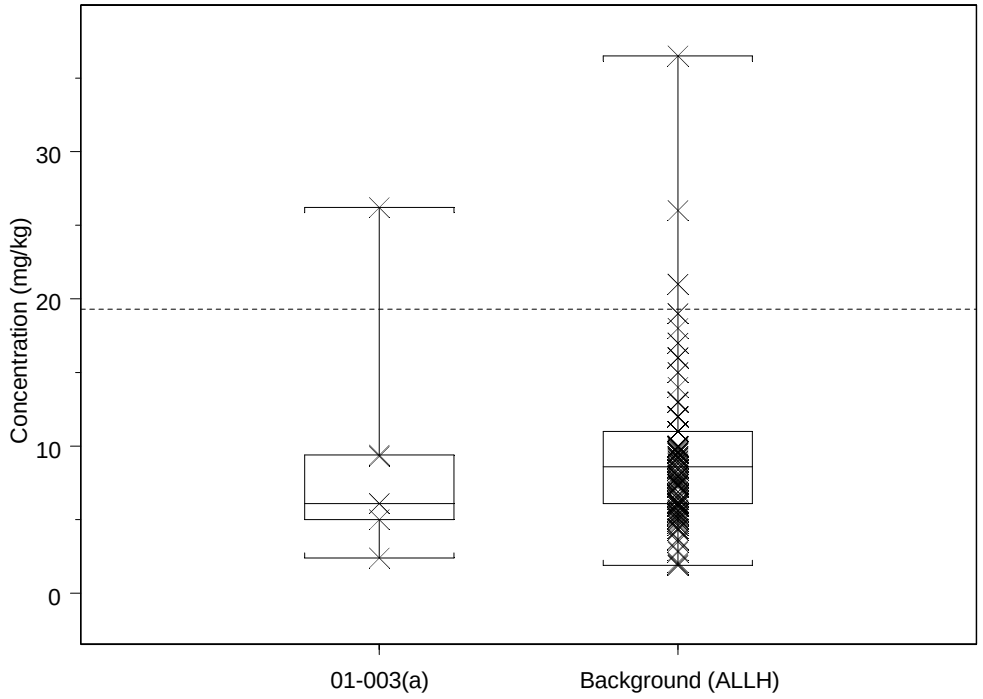


Figure F-3.13-3 Site concentrations of chromium in soil at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

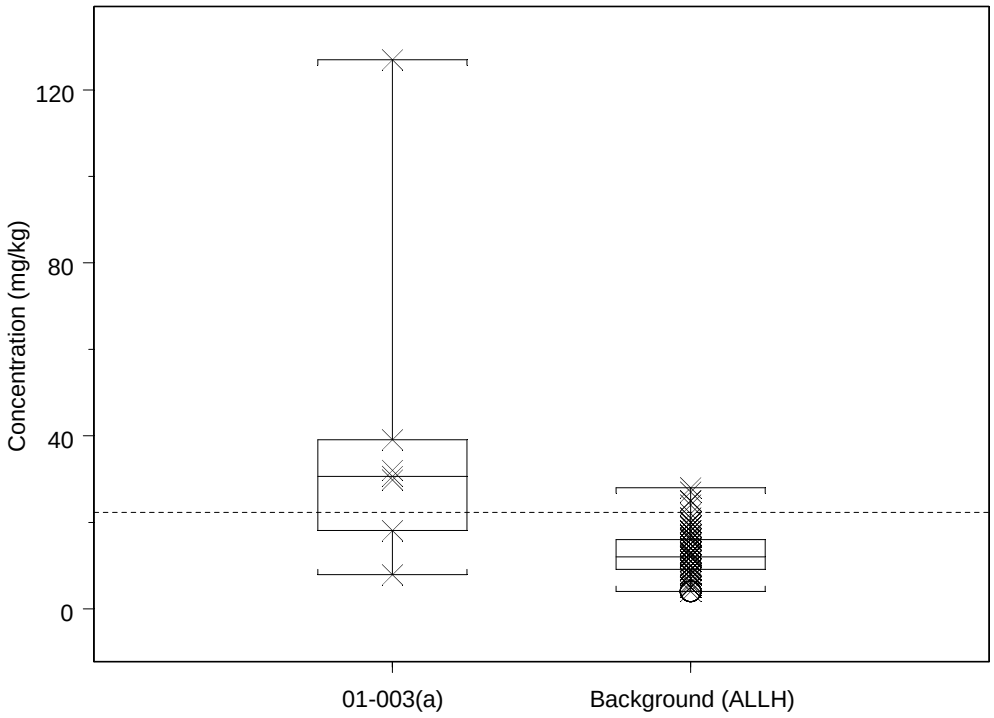


Figure F-3.13-4 Site concentrations of lead in soil at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

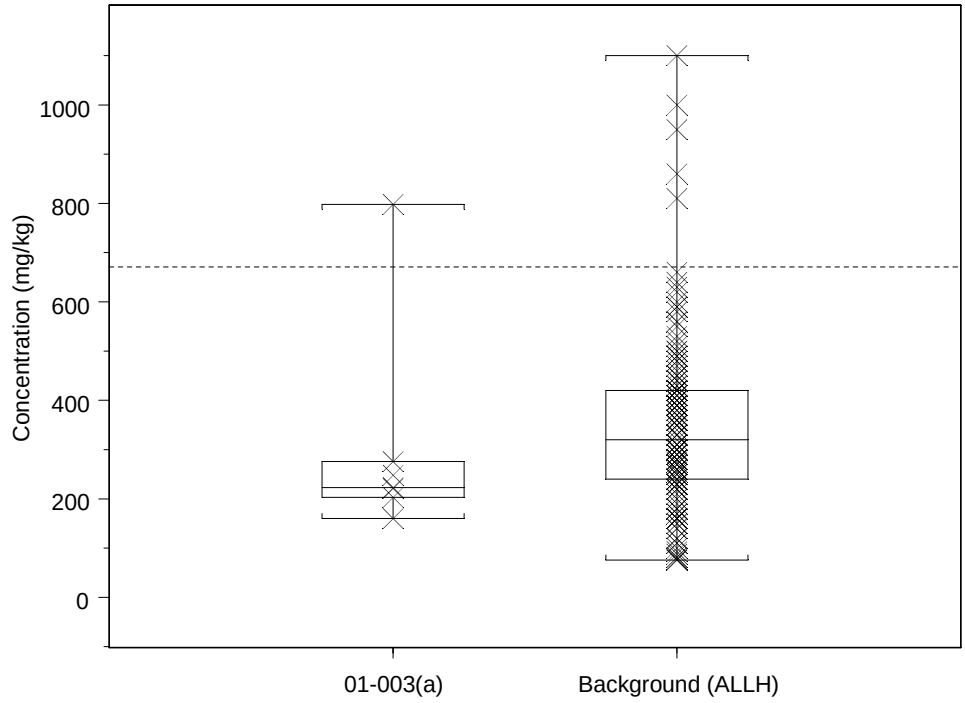


Figure F-3.13-5 Site concentrations of manganese in soil at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

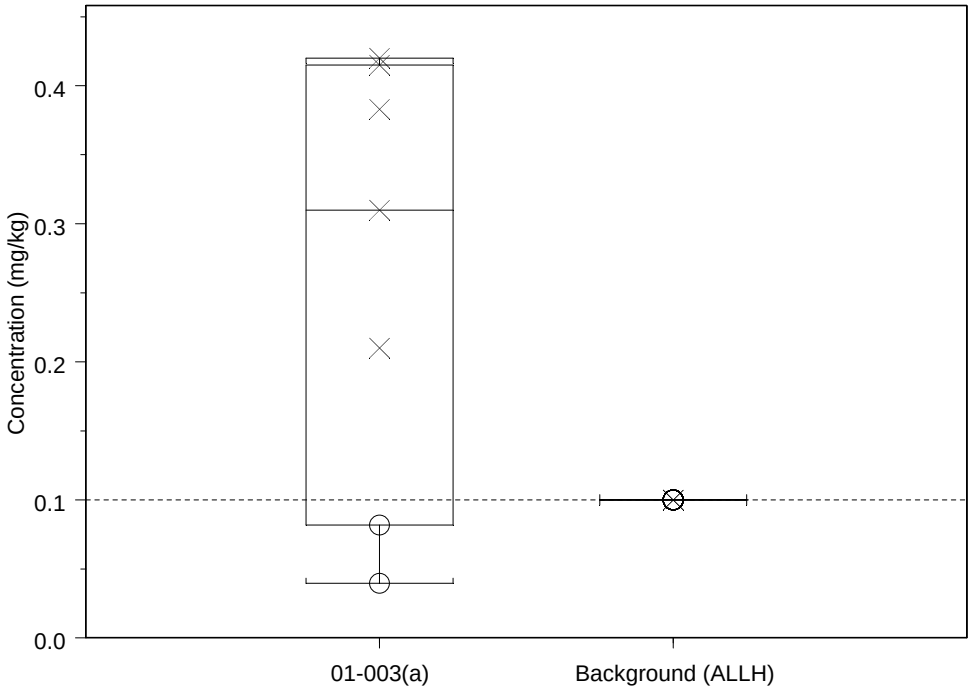


Figure F-3.13-6 Site concentrations of mercury in soil at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

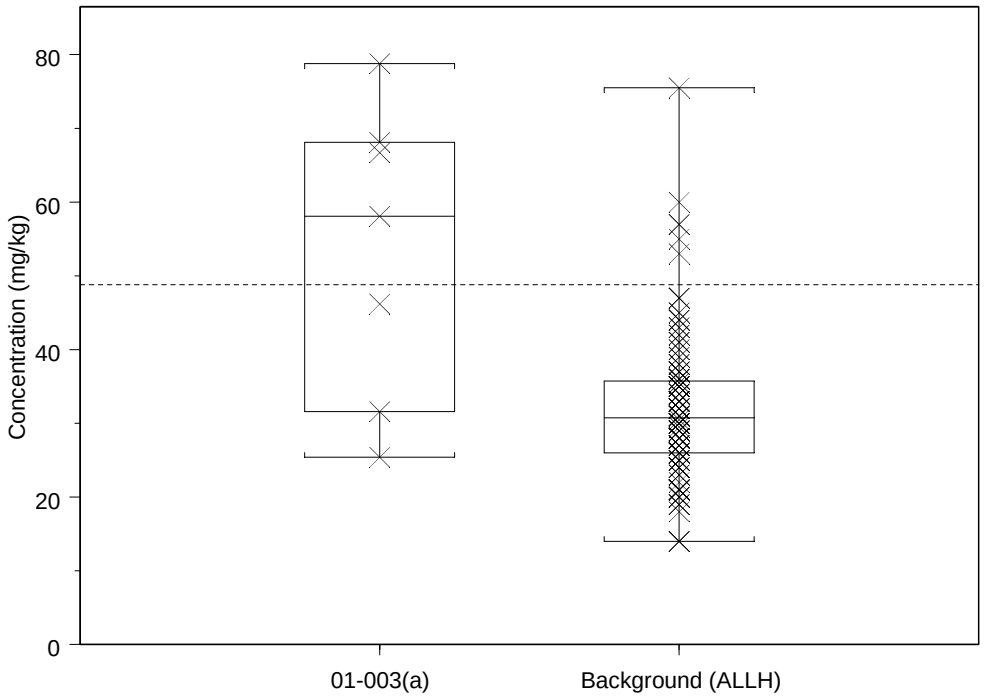


Figure F-3.13-7 Site concentrations of zinc in soil at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

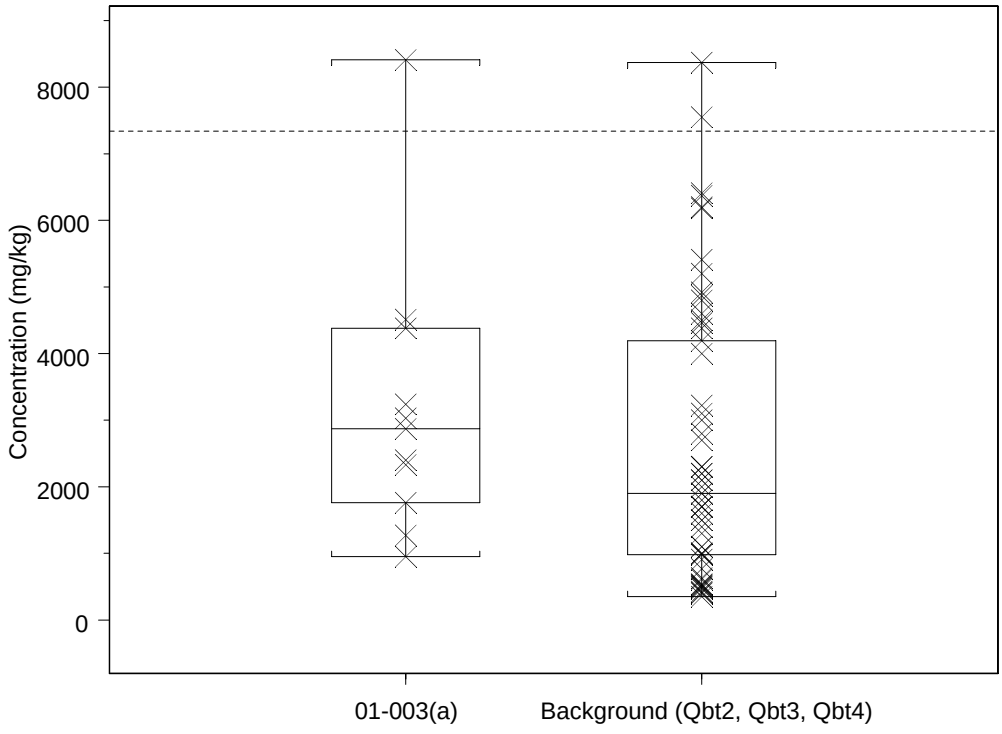


Figure F-3.13-8 Site concentrations of aluminum in tuff at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

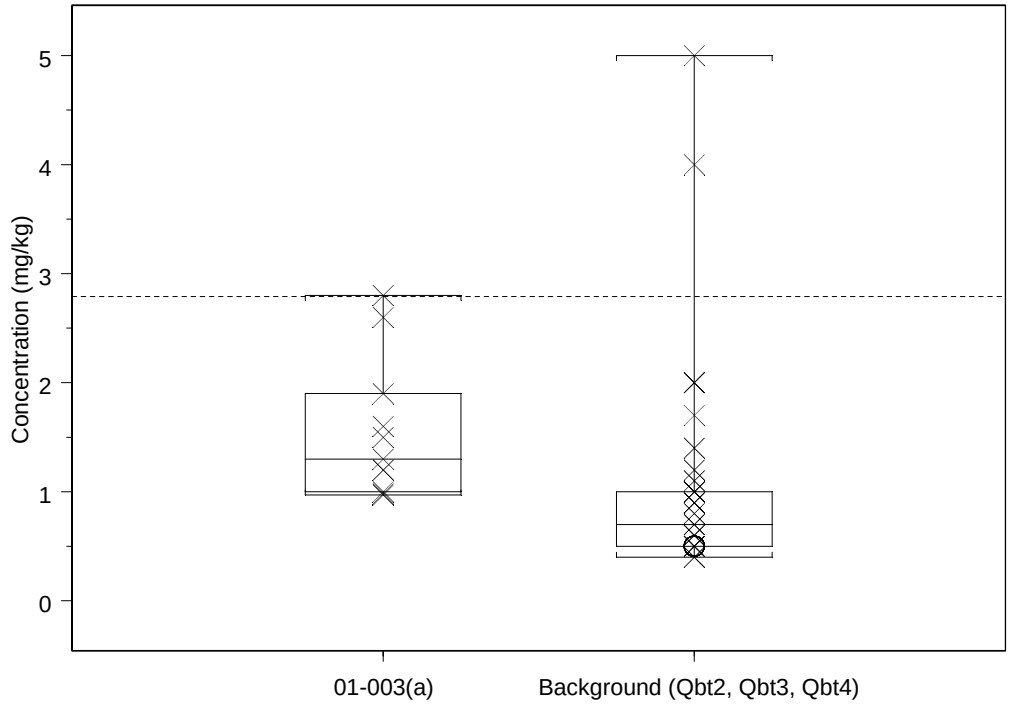


Figure F-3.13-9 Site concentrations of arsenic in tuff at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

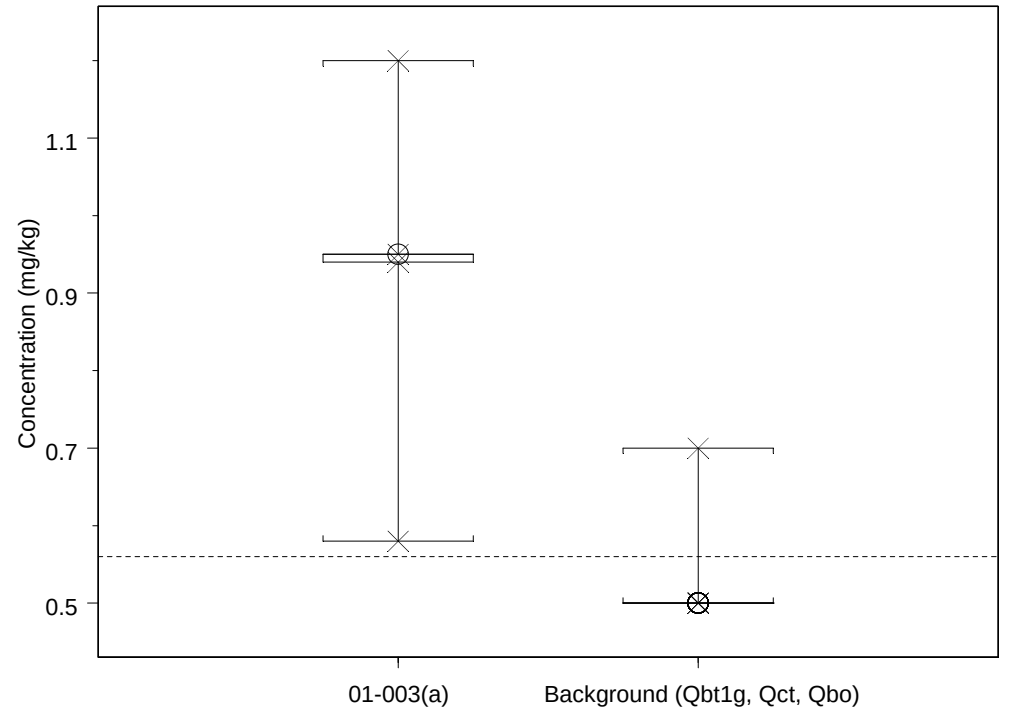


Figure F-3.13-10 Site concentrations of arsenic in Qbt1g at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

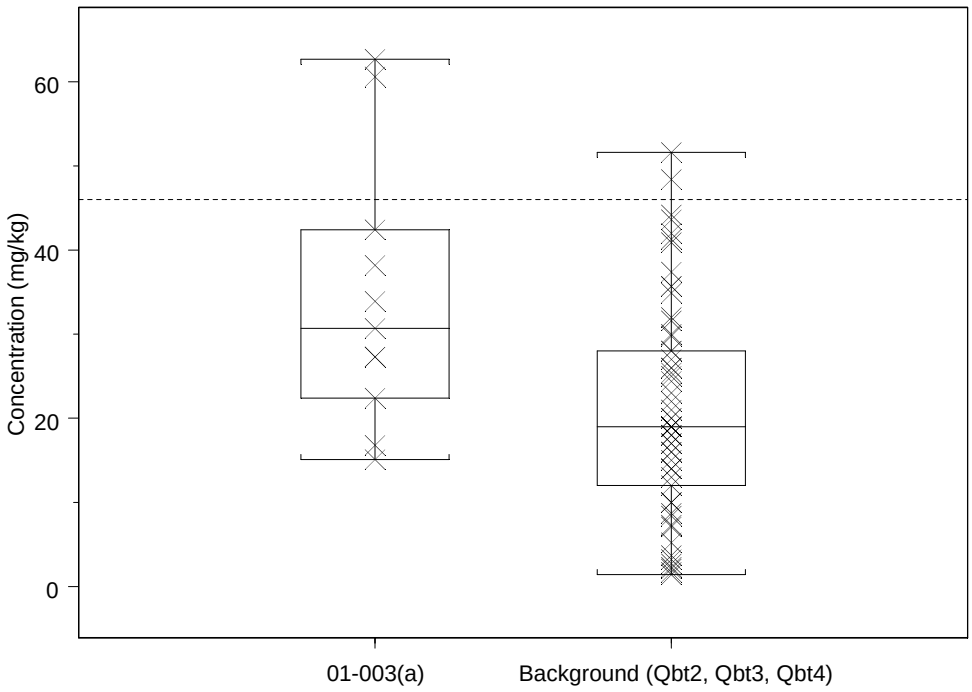


Figure F-3.13-11 Site concentrations of barium in tuff at SWMU 01-003(a) compared to background
(× = detect, ○ = nondetect)

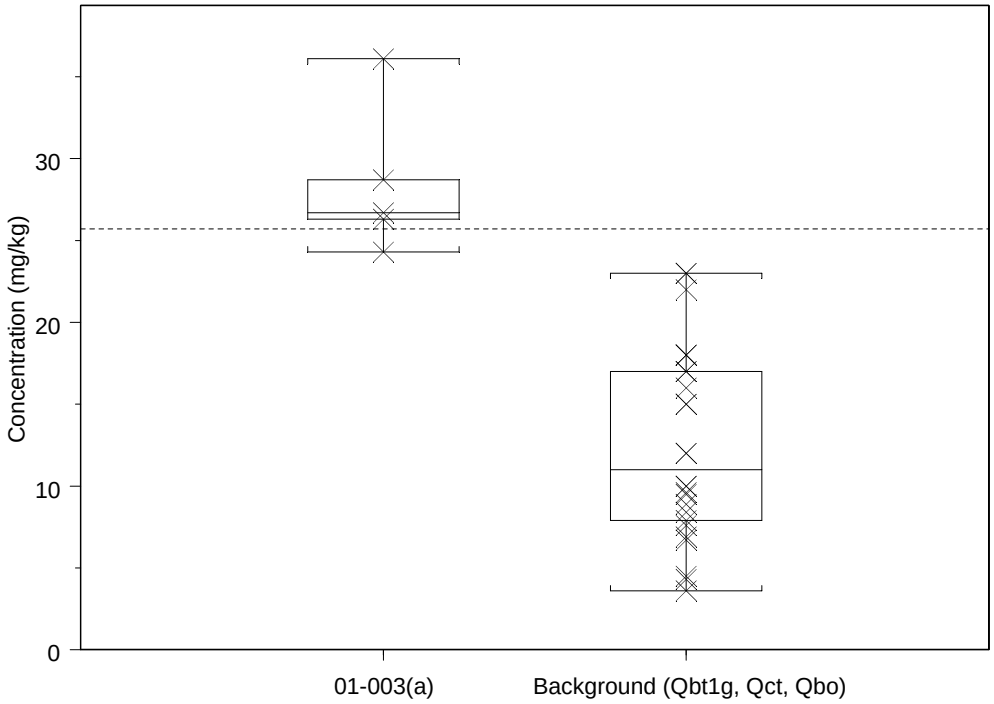


Figure F-3.13-12 Site concentrations of barium in Qbt1g at SWMU 01-003(a) compared to background
(× = detect, ○ = nondetect)

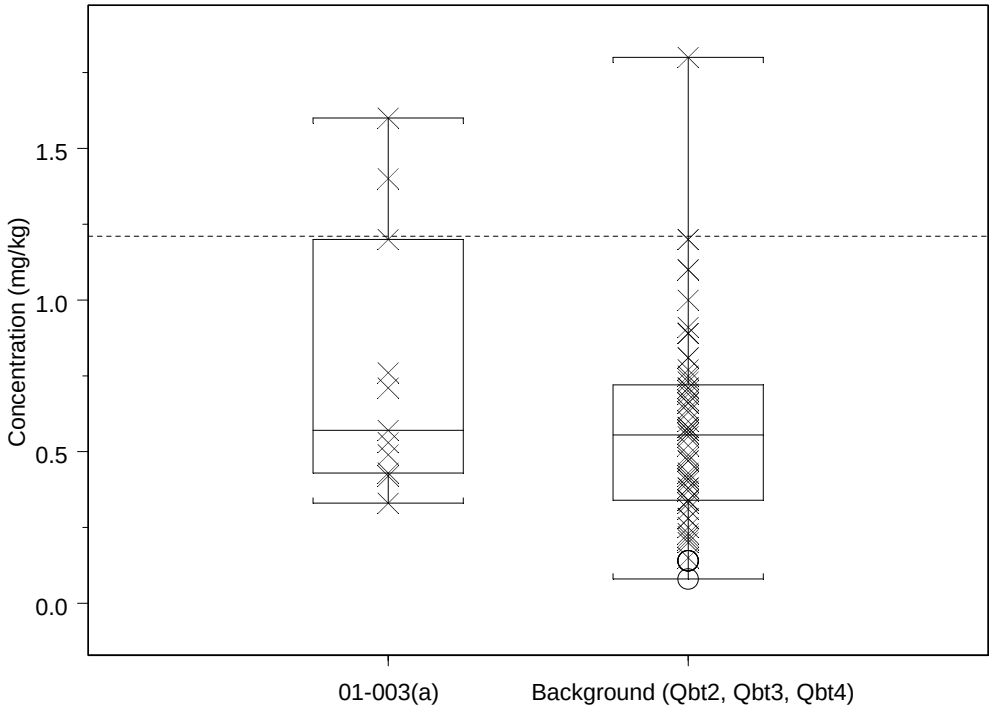


Figure F-3.13-13 Site concentrations of beryllium in tuff at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

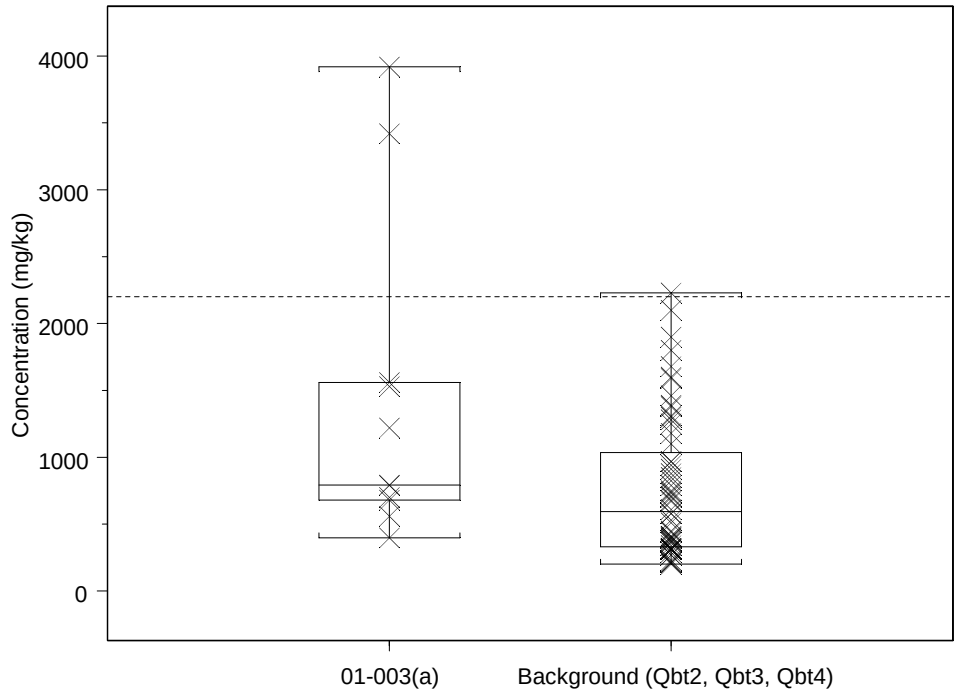


Figure F-3.13-14 Site concentrations of calcium in tuff at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

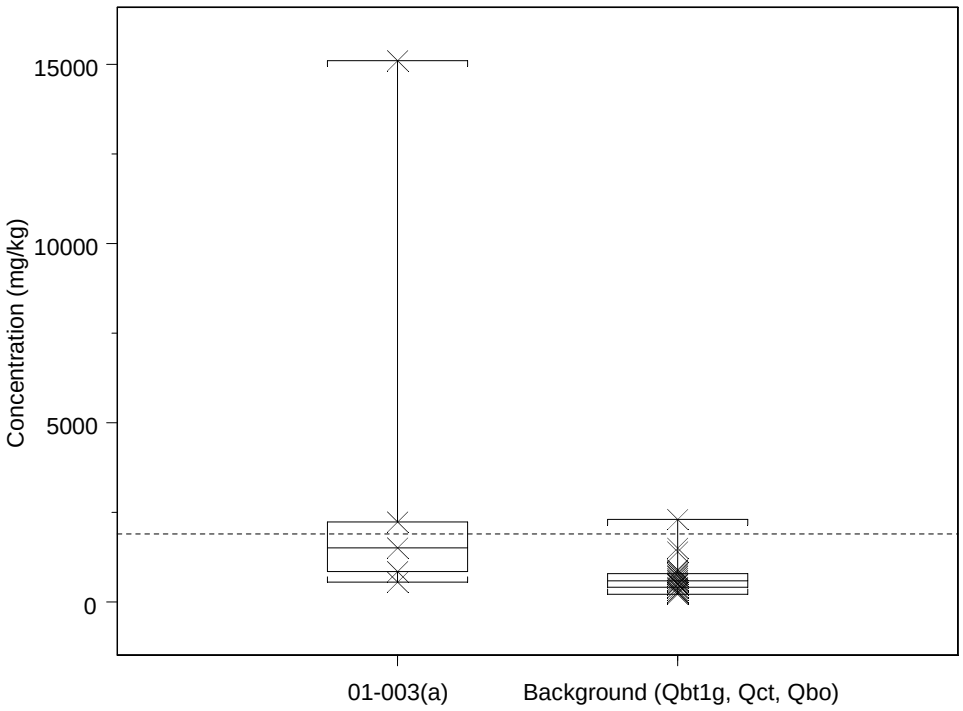


Figure F-3.13-15 Site concentrations of calcium in Qbt1g at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

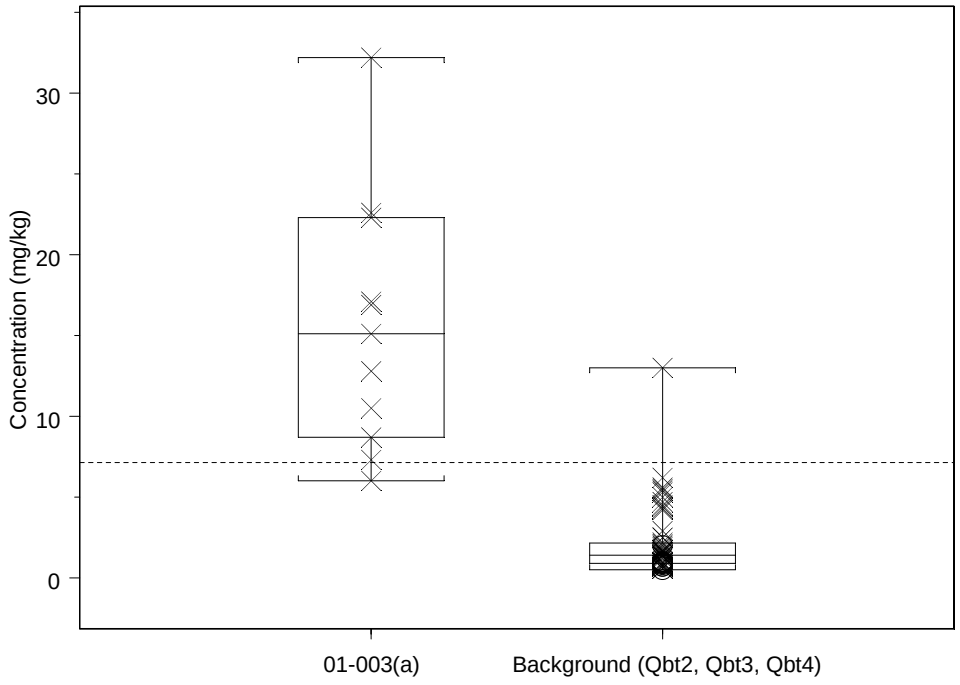


Figure F-3.13-16 Site concentrations of chromium in tuff at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

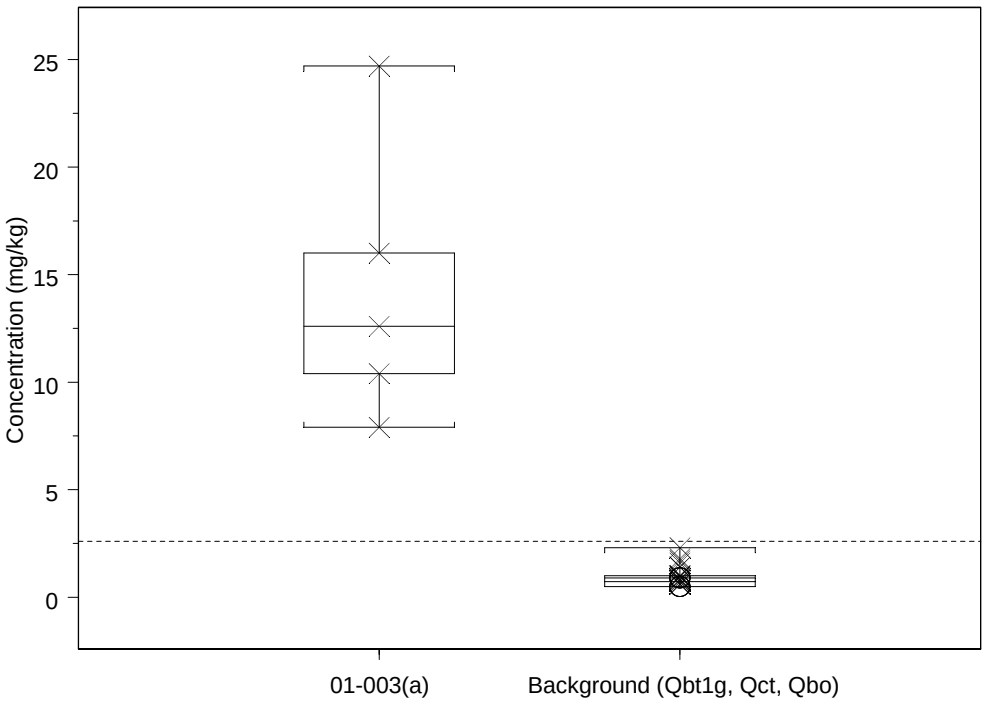


Figure F-3.13-17 Site concentrations of chromium in Qbt1g at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

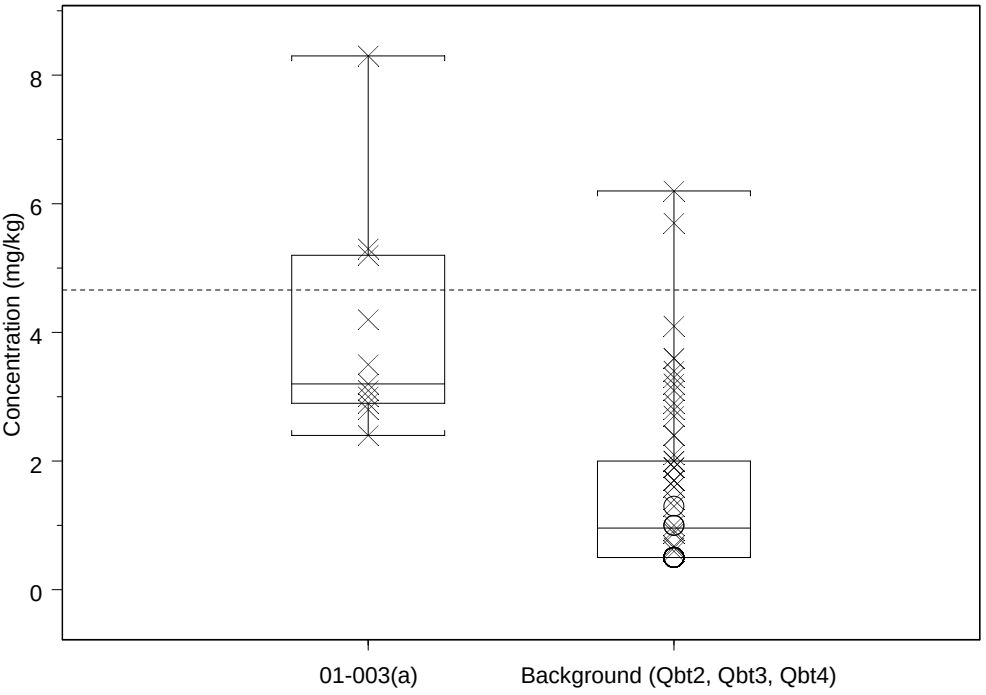


Figure F-3.13-18 Site concentrations of copper in tuff at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

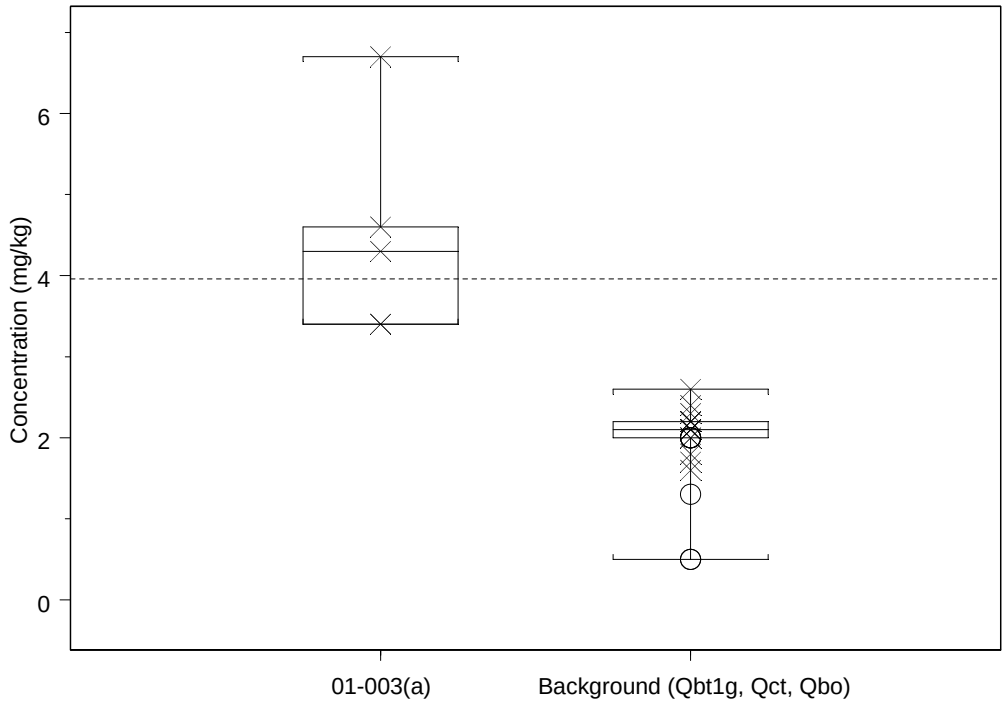


Figure F-3.13-19 Site concentrations of copper in Qbt1g at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

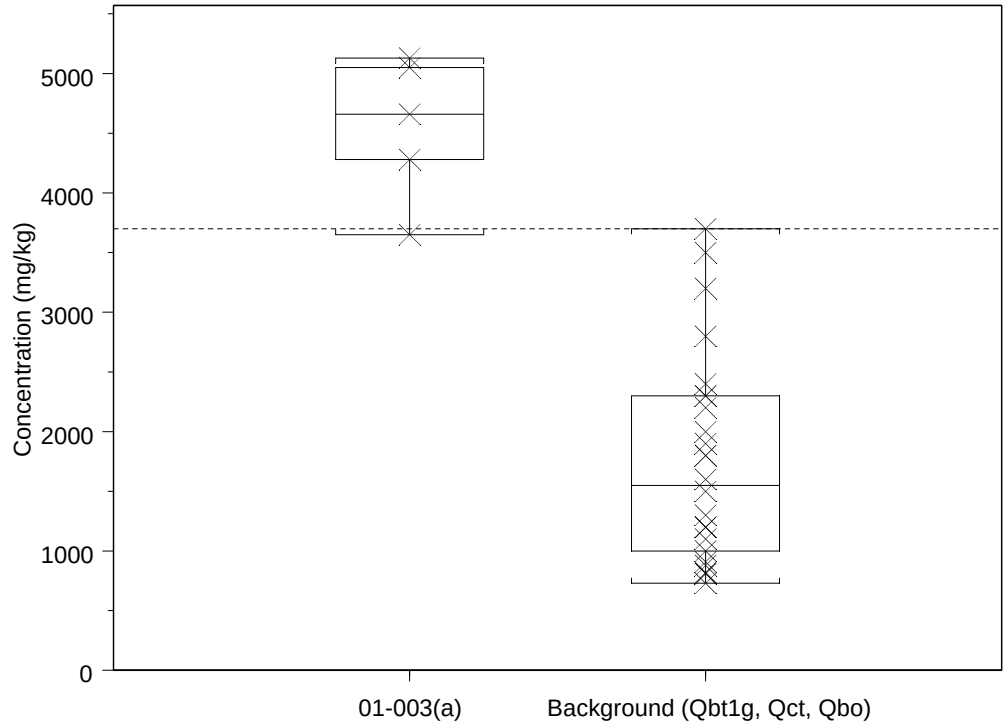


Figure F-3.13-20 Site concentrations of iron in Qbt1g at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

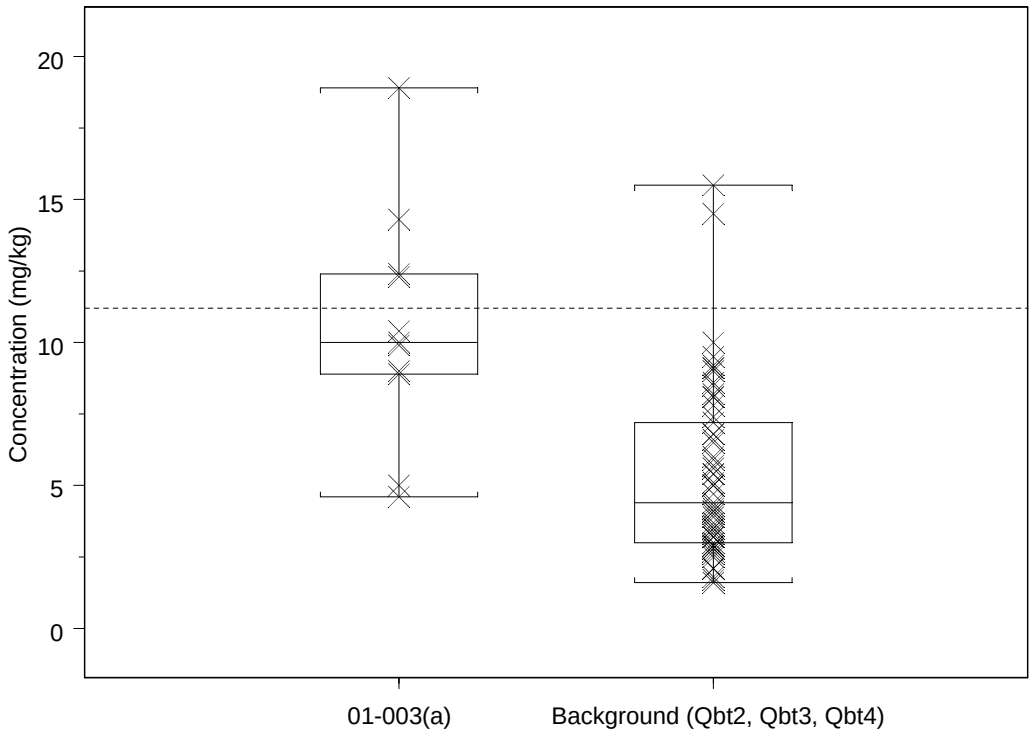


Figure F-3.13-21 Site concentrations of lead in tuff at SWMU 01-003(a) compared to background
(× = detect, ○ = nondetect)

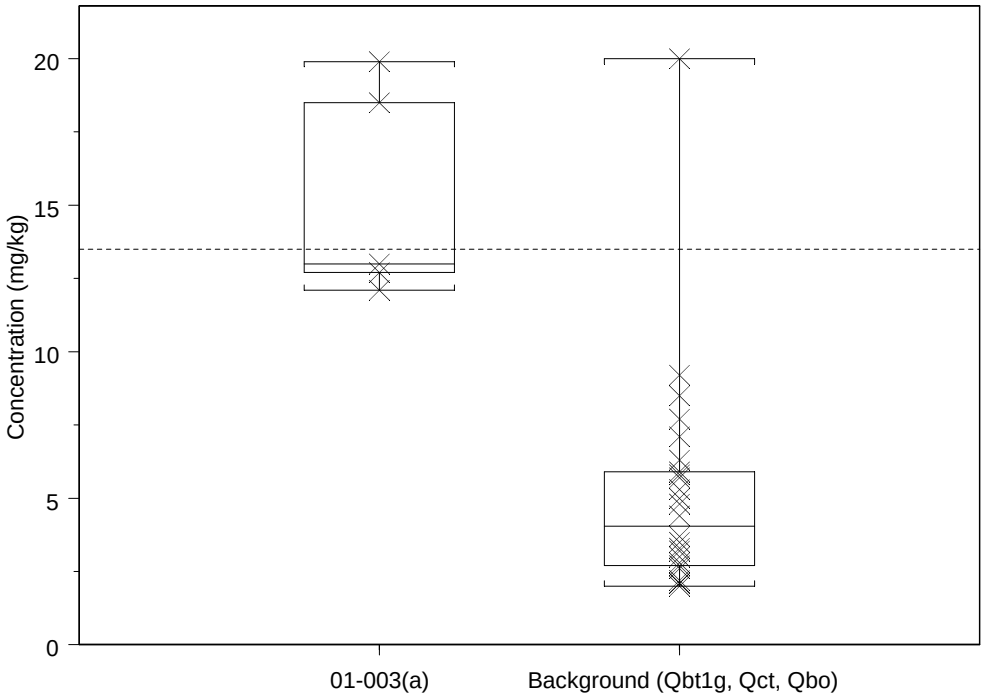


Figure F-3.13-22 Site concentrations of lead in Qbt1g at SWMU 01-003(a) compared to background
(× = detect, ○ = nondetect)

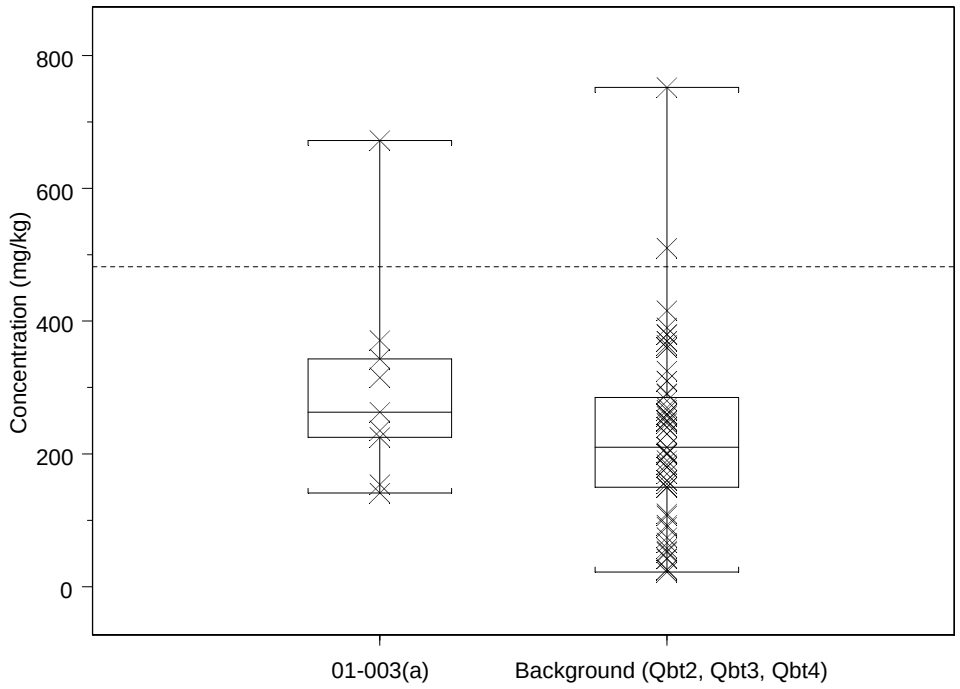


Figure F-3.13-23 Site concentrations of manganese in tuff at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

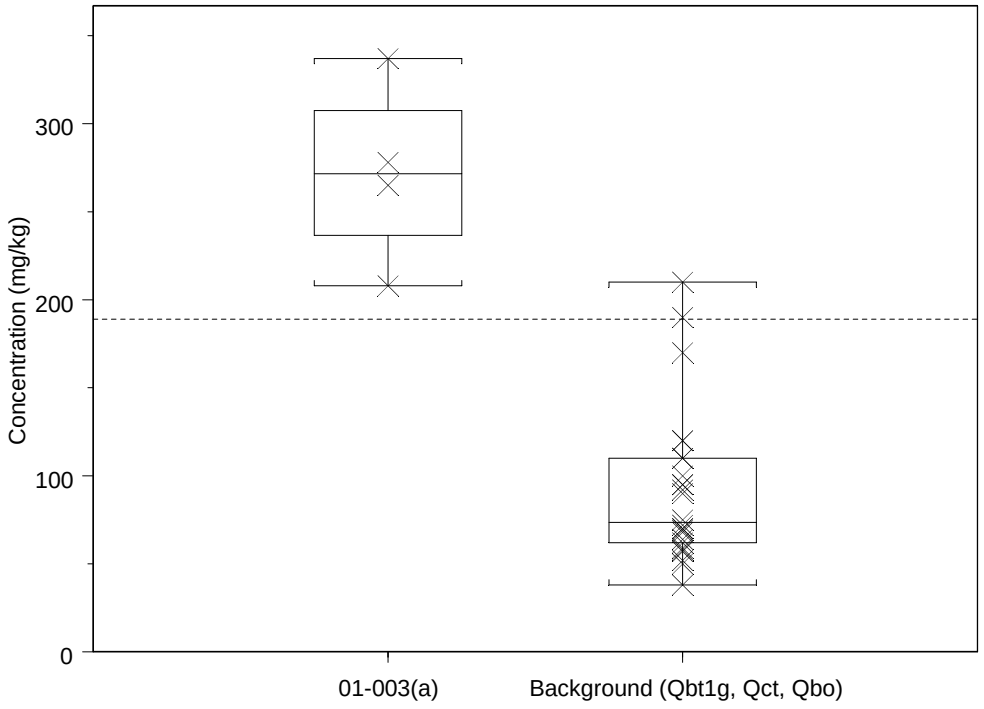


Figure F-3.13-24 Site concentrations of manganese in Qbt1g at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

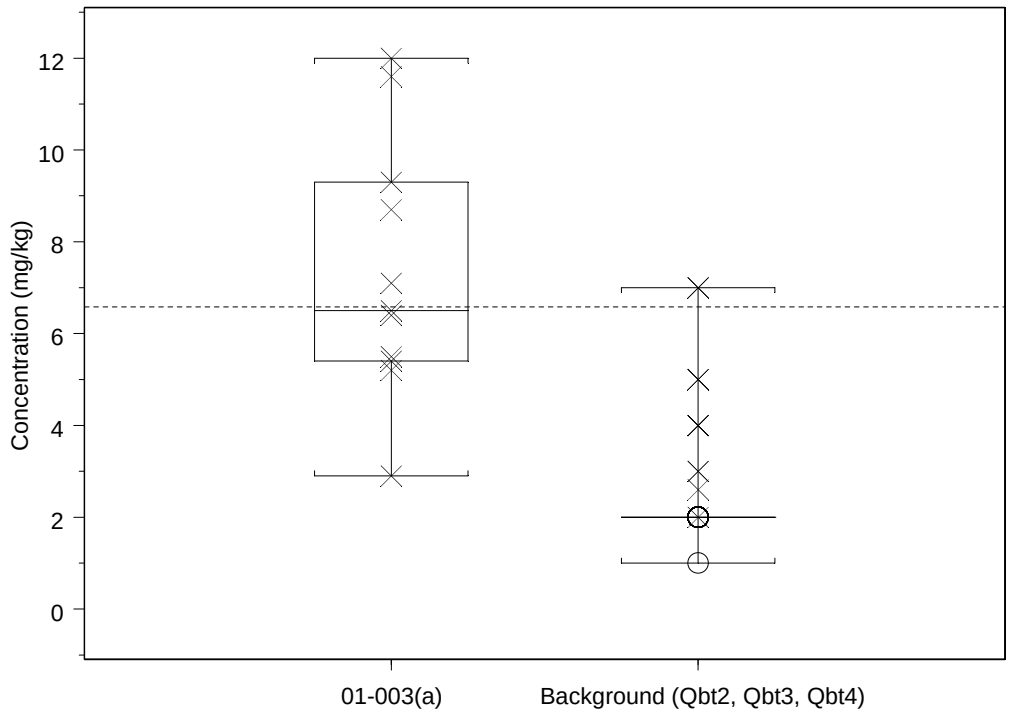


Figure F-3.13-25 Site concentrations of nickel in tuff at SWMU 01-003(a) compared to background
(× = detect, ○ = nondetect)

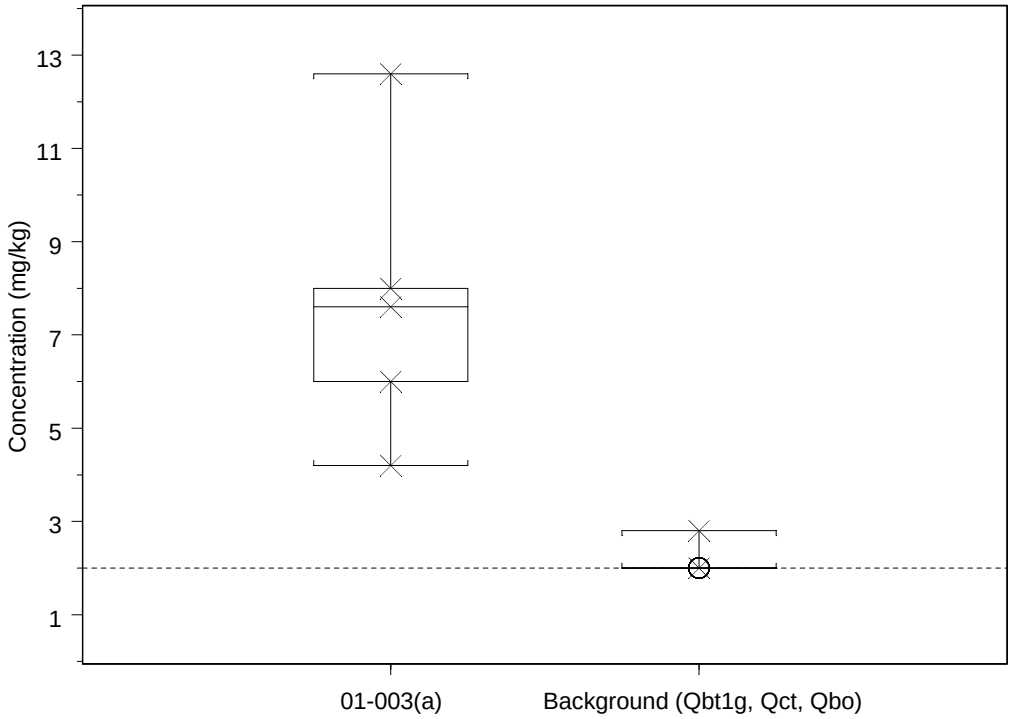


Figure F-3.13-26 Site concentrations of nickel in Qbt1g at SWMU 01-003(a) compared to background
(× = detect, ○ = nondetect)

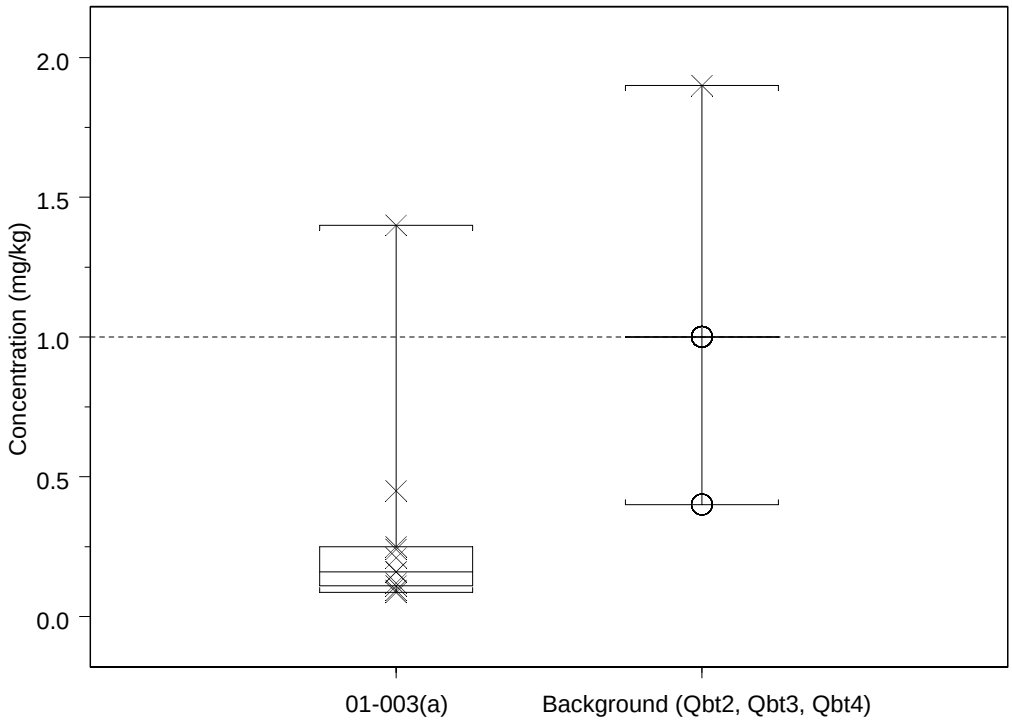


Figure F-3.13-27 Site concentrations of silver in tuff at SWMU 01-003(a) compared to background
(× = detect, ○ = nondetect)

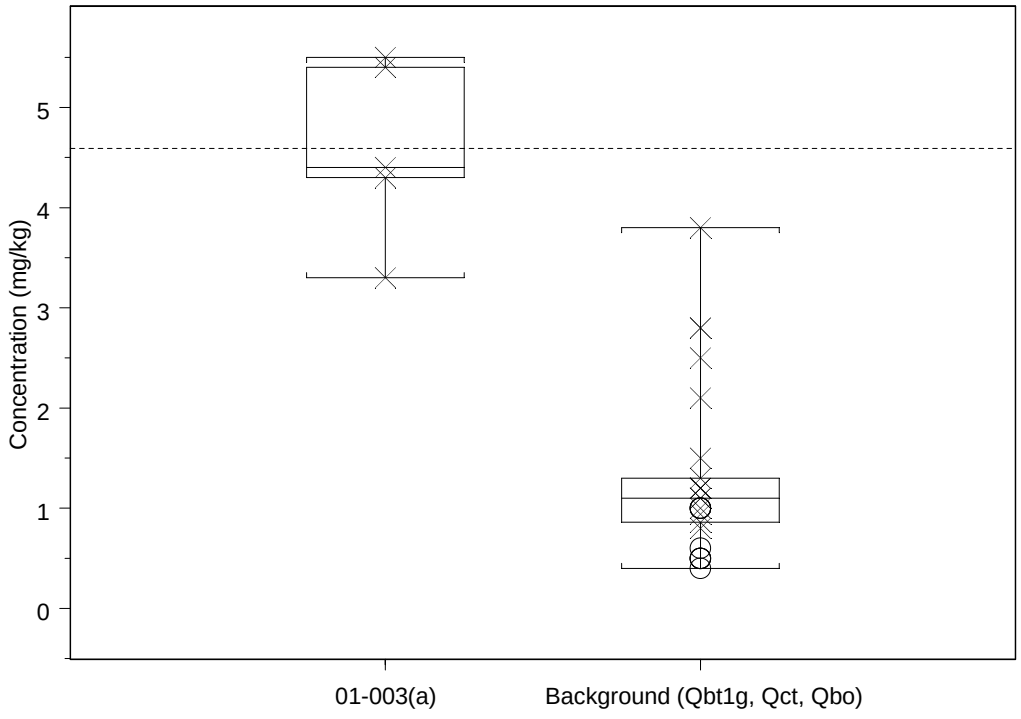


Figure F-3.13-28 Site concentrations of vanadium in Qbt1g at SWMU 01-003(a) compared to background
(× = detect, ○ = nondetect)

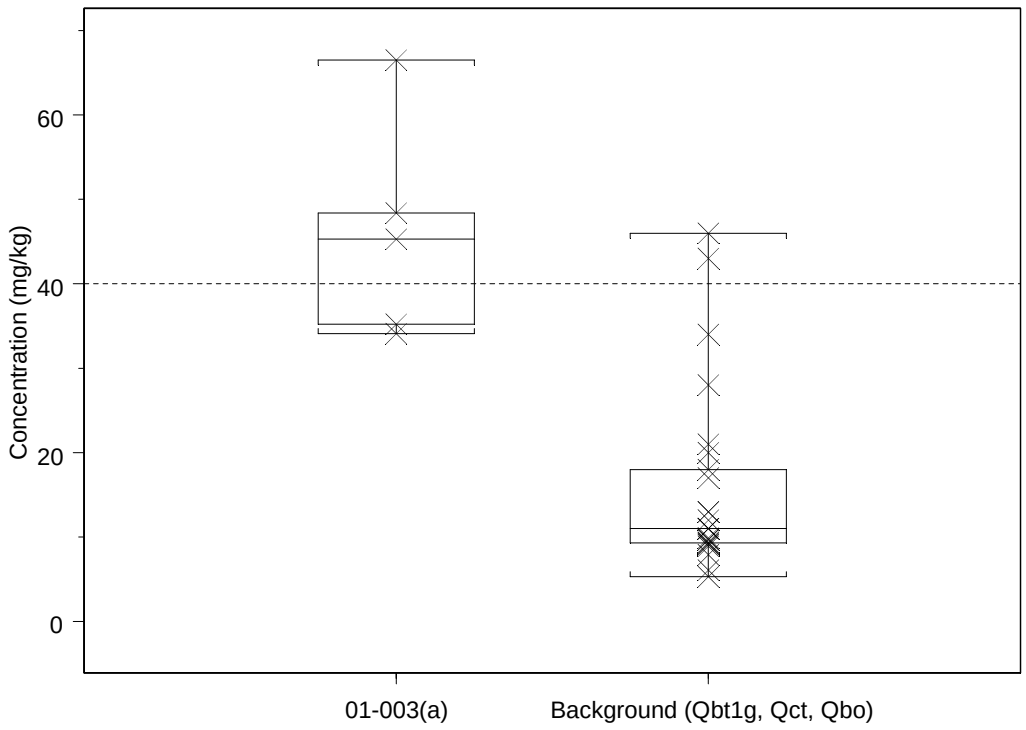


Figure F-3.13-29 Site concentrations of zinc in Qbt1g at SWMU 01-003(a) compared to background
(× = detect, ○ = nondetect)

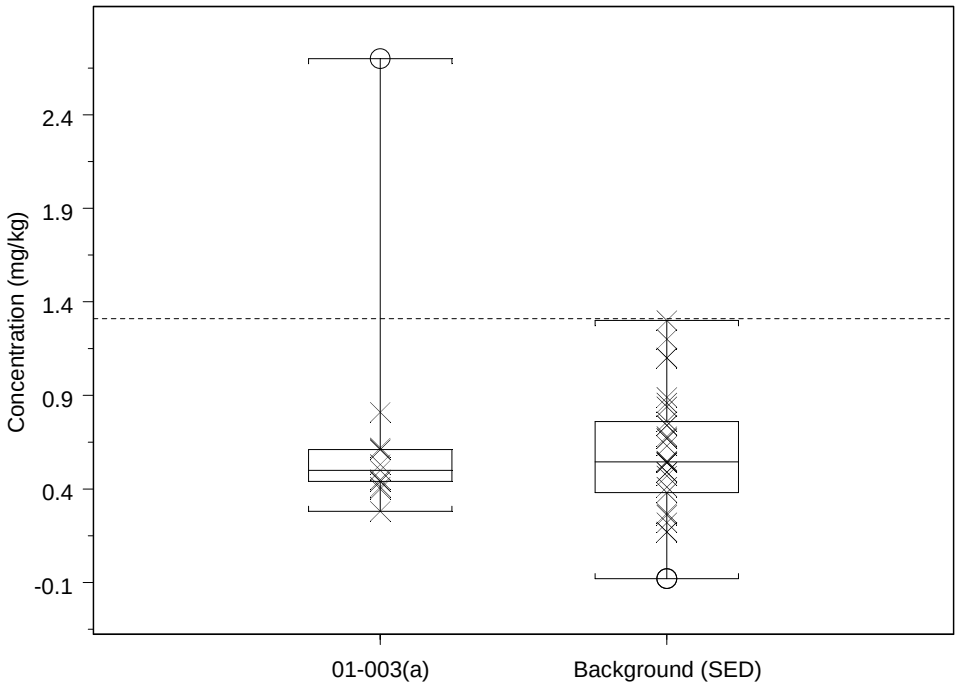


Figure F-3.13-30 Site concentrations of beryllium in sediment at SWMU 01-003(a) compared to background
(× = detect, ○ = nondetect)

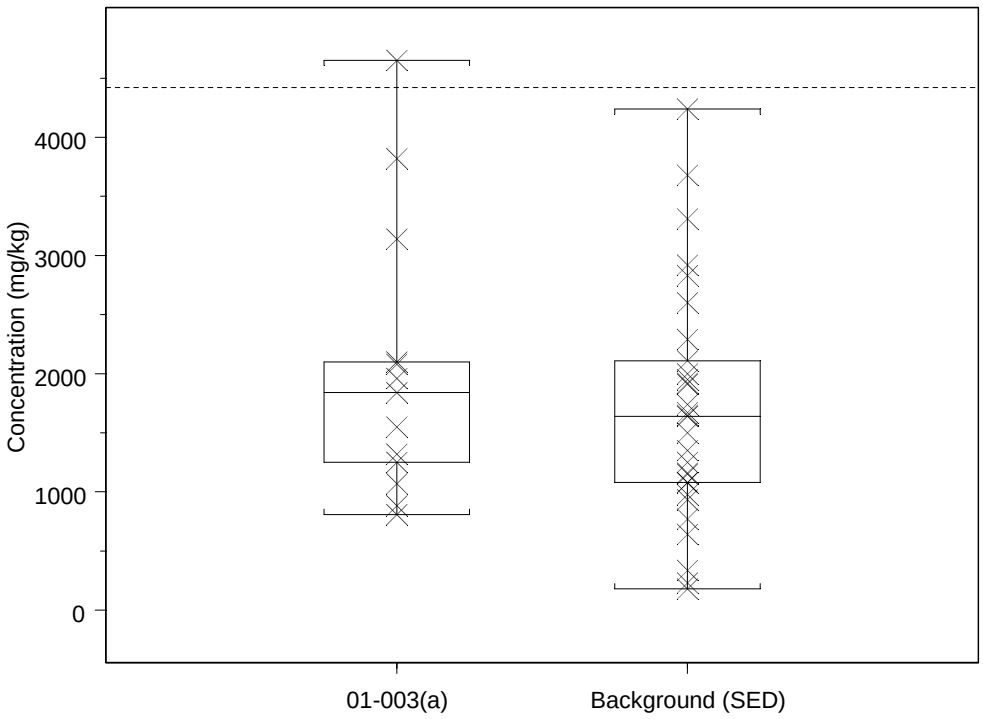


Figure F-3.13-31 Site concentrations of calcium in sediment at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

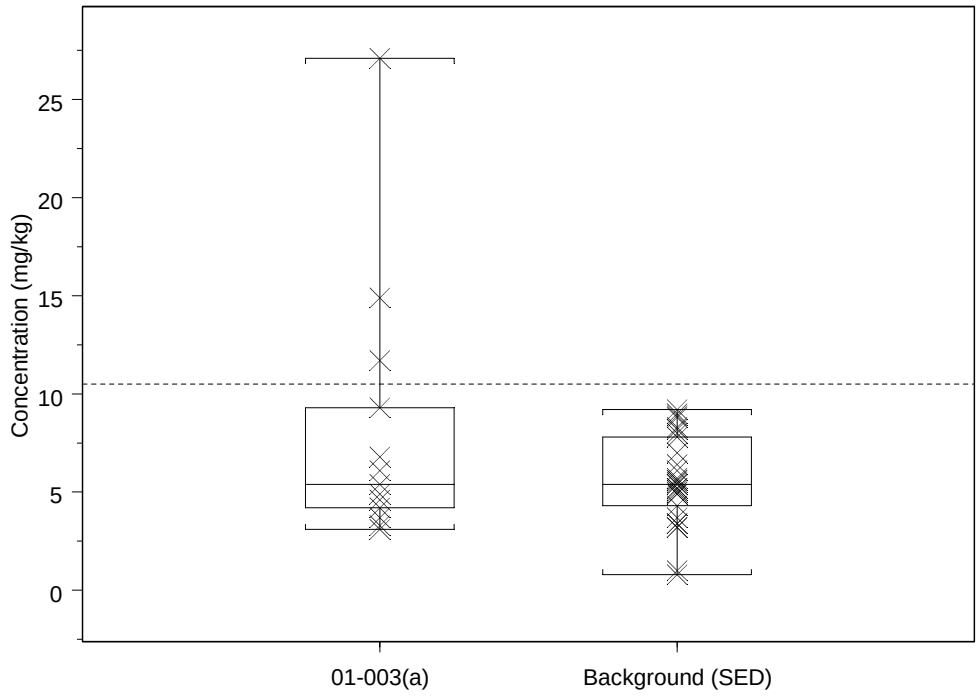


Figure F-3.13-32 Site concentrations of chromium in sediment at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

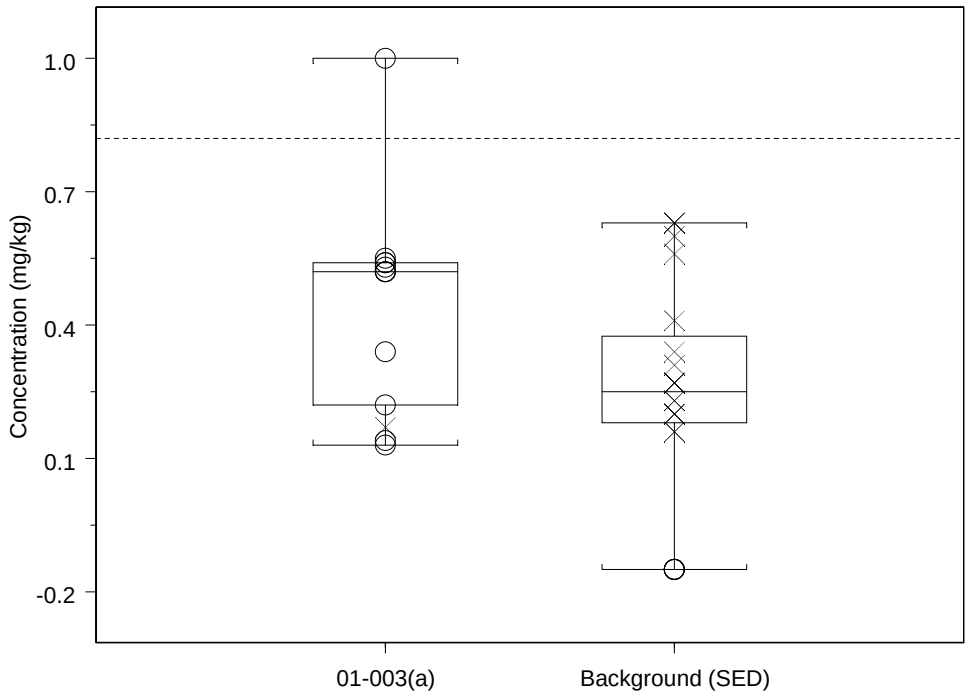


Figure F-3.13-33 Site concentrations of Cyanide (total) in sediment at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

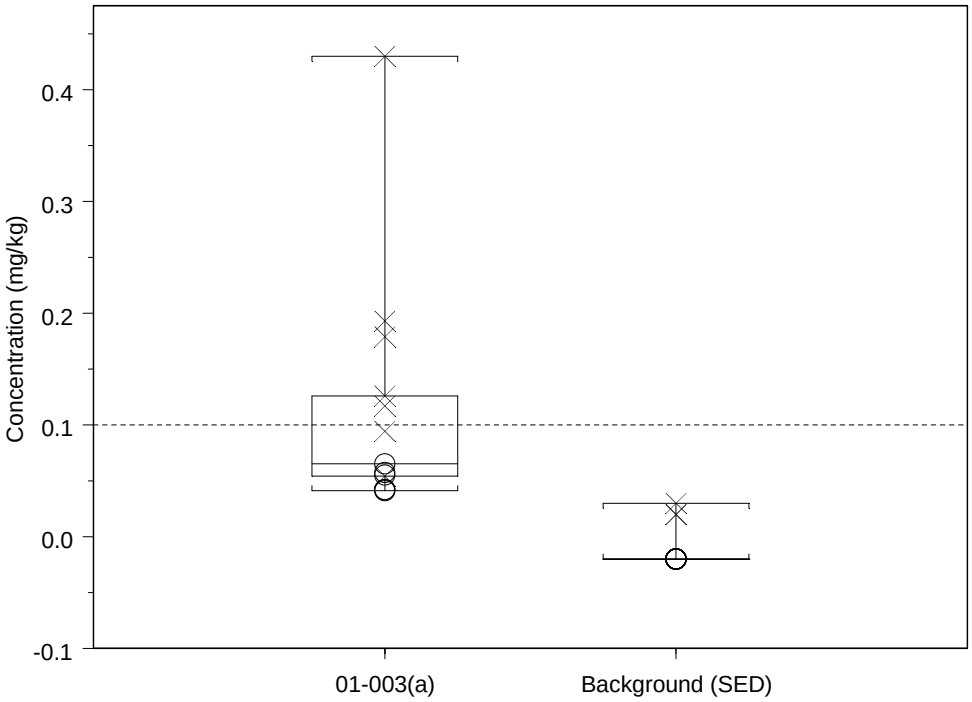


Figure F-3.13-34 Site concentrations of mercury in sediment at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

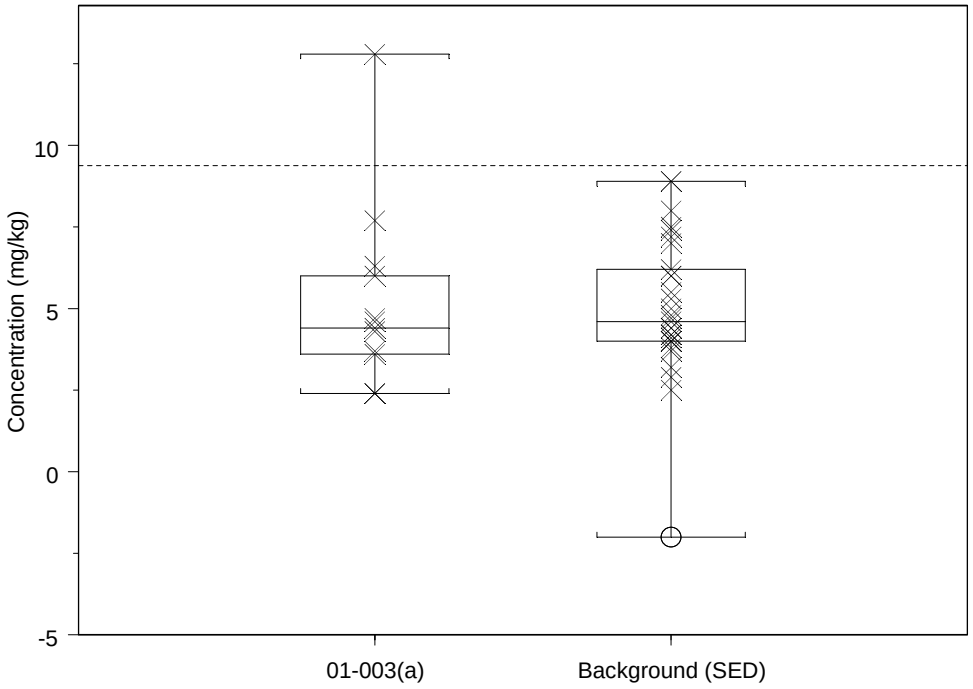


Figure F-3.13-35 Site concentrations of nickel in sediment at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

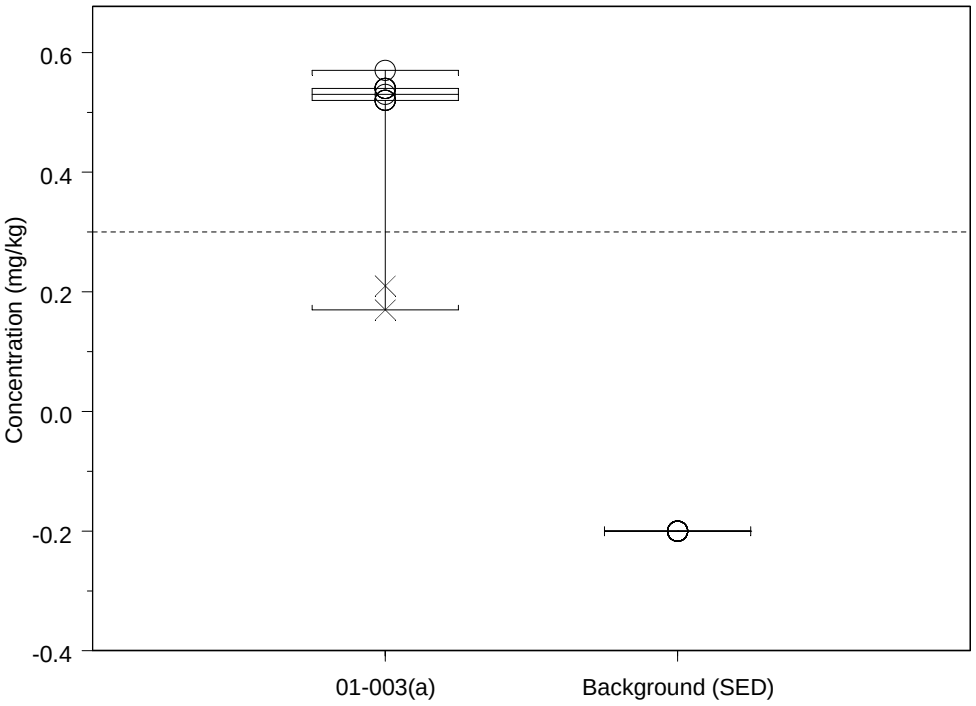


Figure F-3.13-36 Site concentrations of selenium in sediment at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

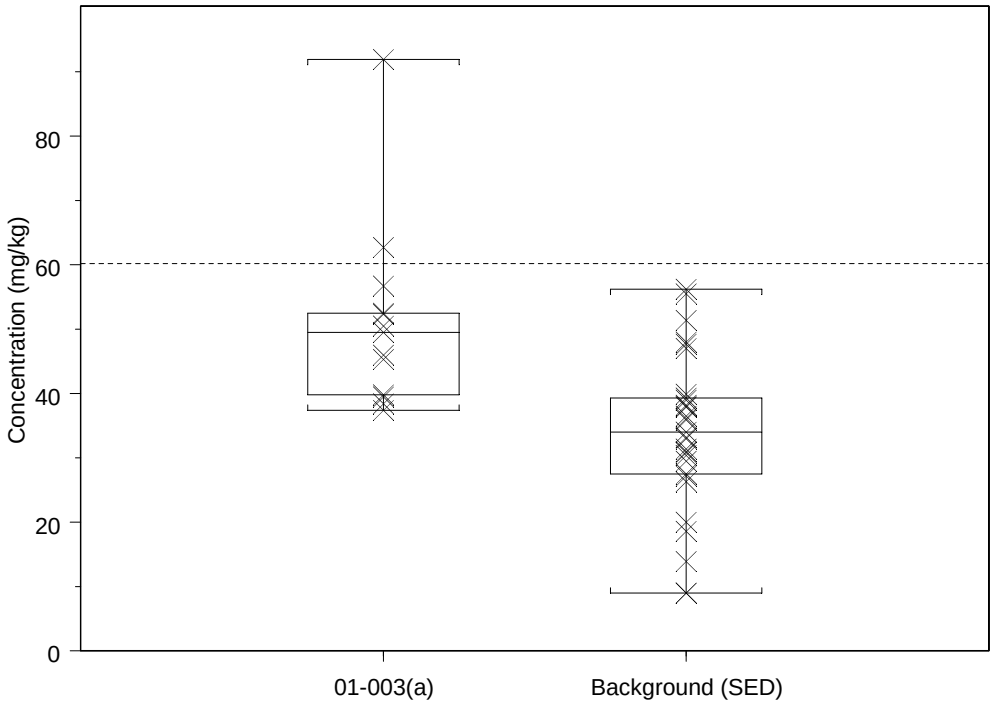


Figure F-3.13-37 Site concentrations of zinc in sediment at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

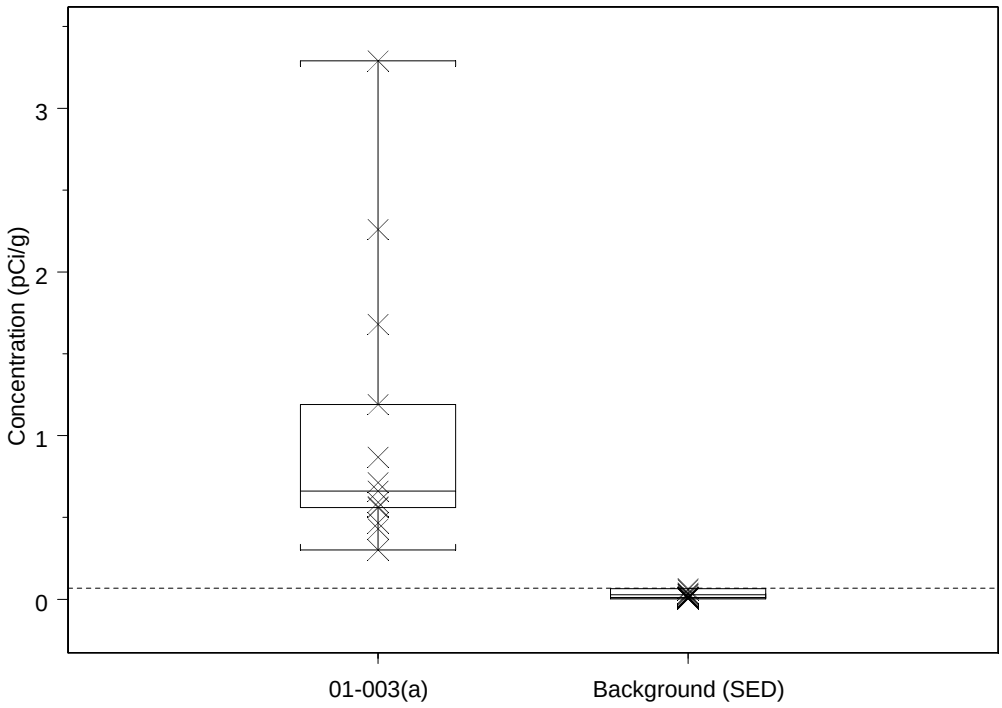


Figure F-3.13-38 Site concentrations of plutonium-239/240 in sediment at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

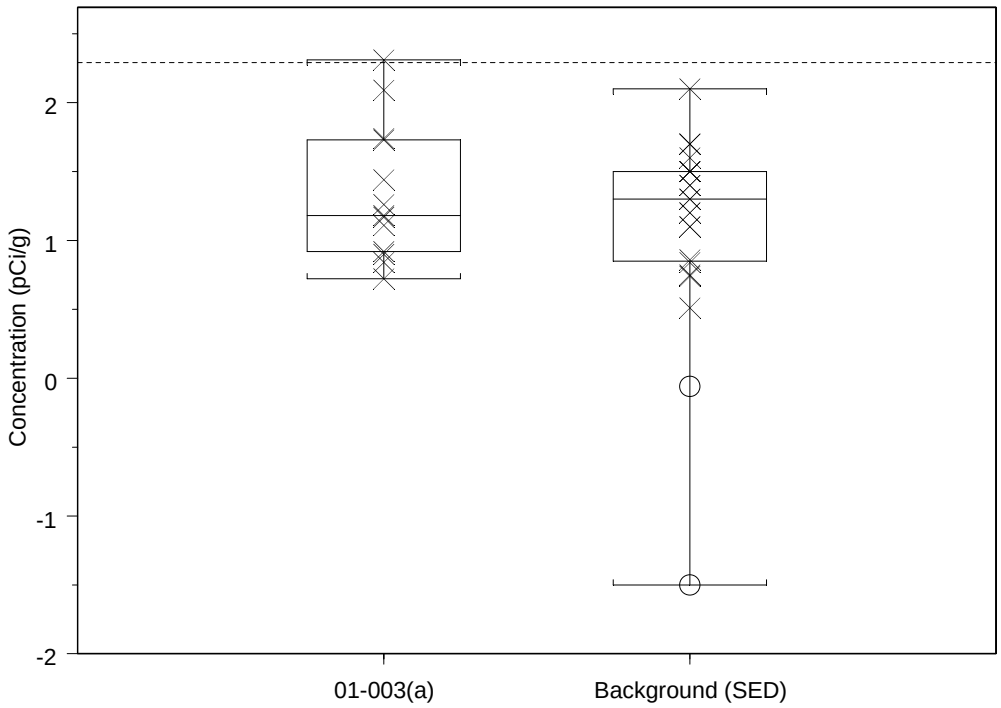


Figure F-3.13-39 Site concentrations of uranium-238 in sediment at SWMU 01-003(a) compared to background

(× = detect, ○ = nondetect)

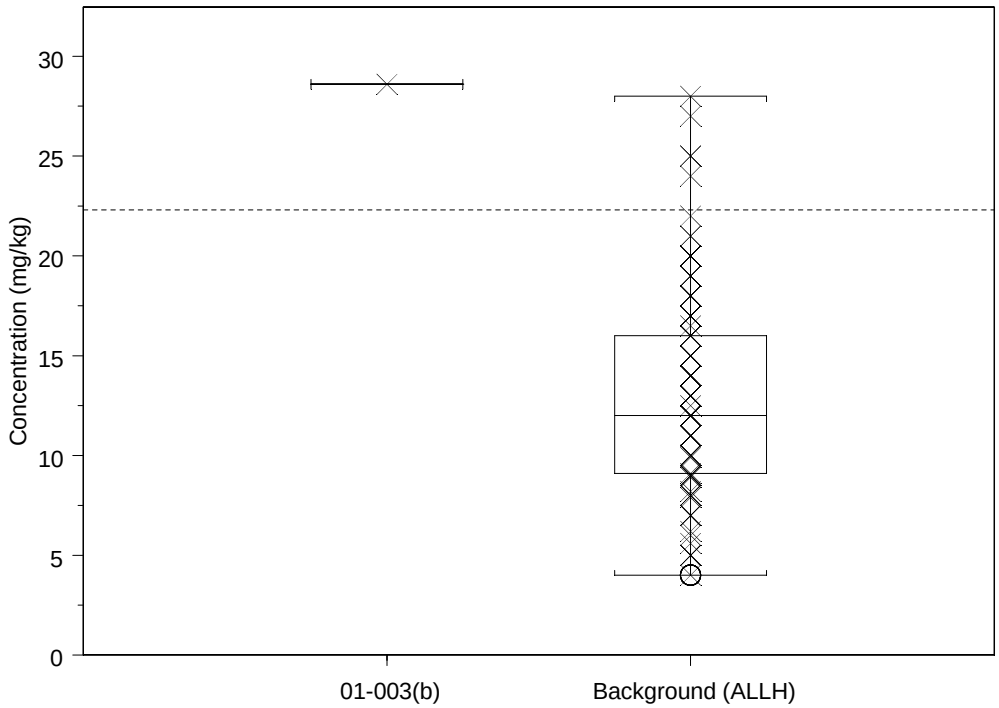


Figure F-3.14-1 Site concentrations of lead in soil at SWMU 01-003(b) compared to background

(× = detect, ○ = nondetect)

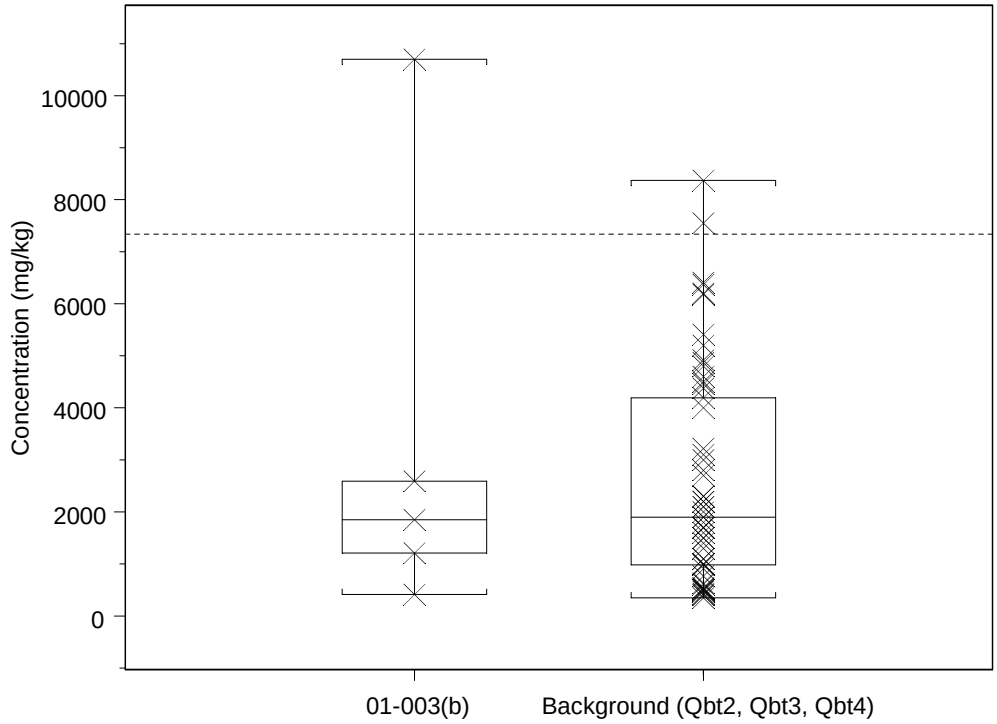


Figure F-3.14-2 Site concentrations of aluminum in tuff at SWMU 01-003(b) compared to background

(× = detect, ○ = nondetect)

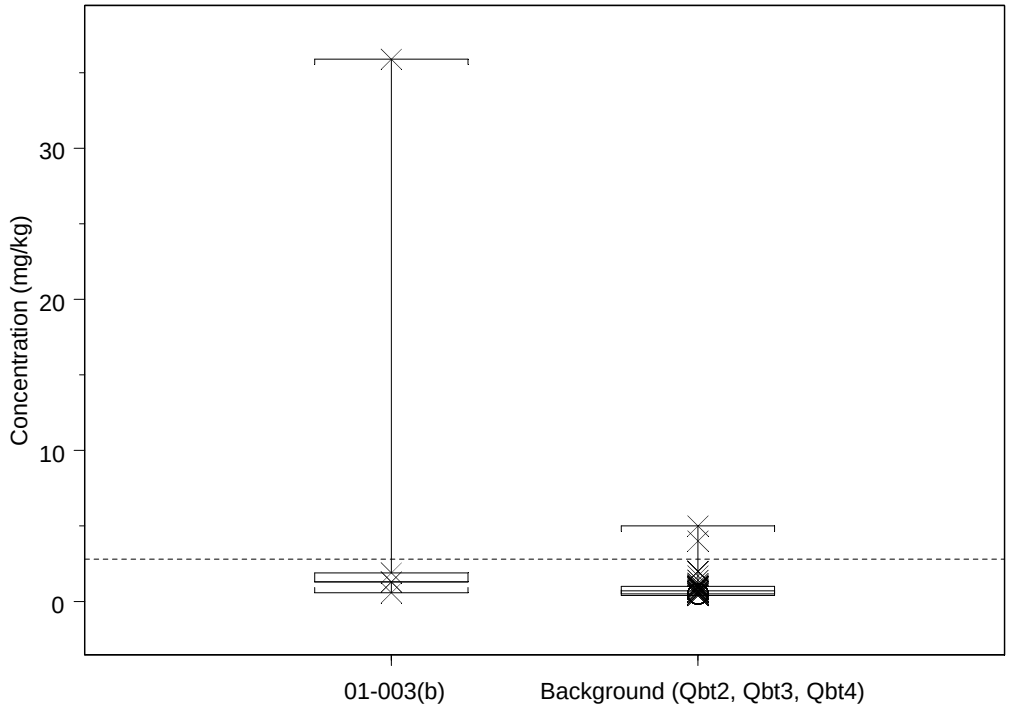


Figure F-3.14-3 Site concentrations of arsenic in tuff at SWMU 01-003(b) compared to background

(× = detect, ○ = nondetect)

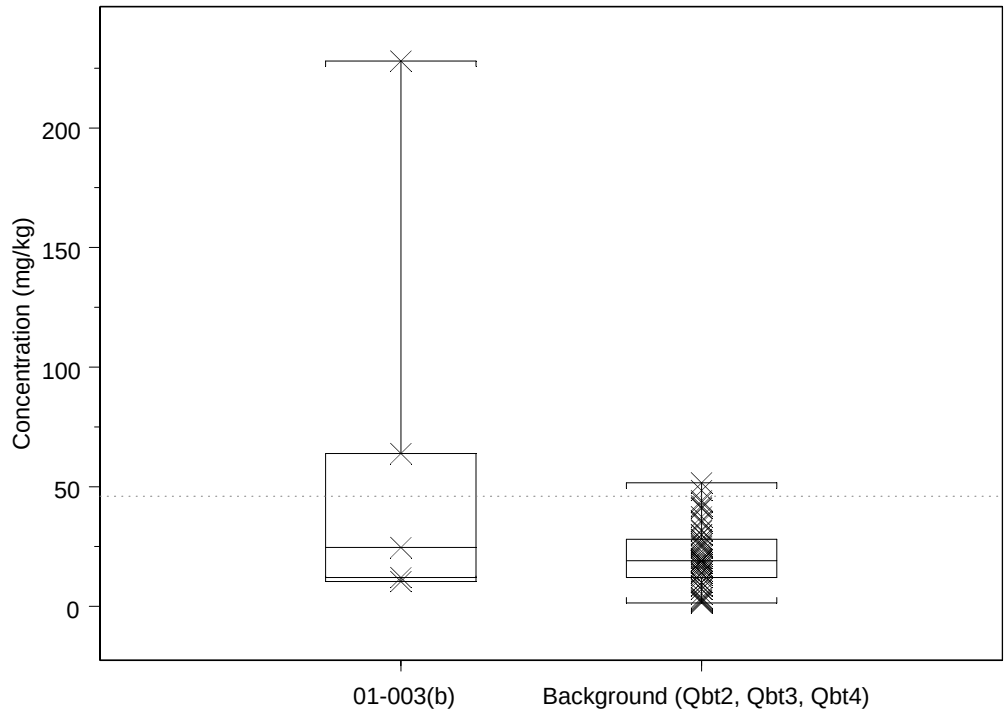


Figure F-3.14-4 Site concentrations of barium in tuff at SWMU 01-003(b) compared to background

(× = detect, ○ = nondetect)

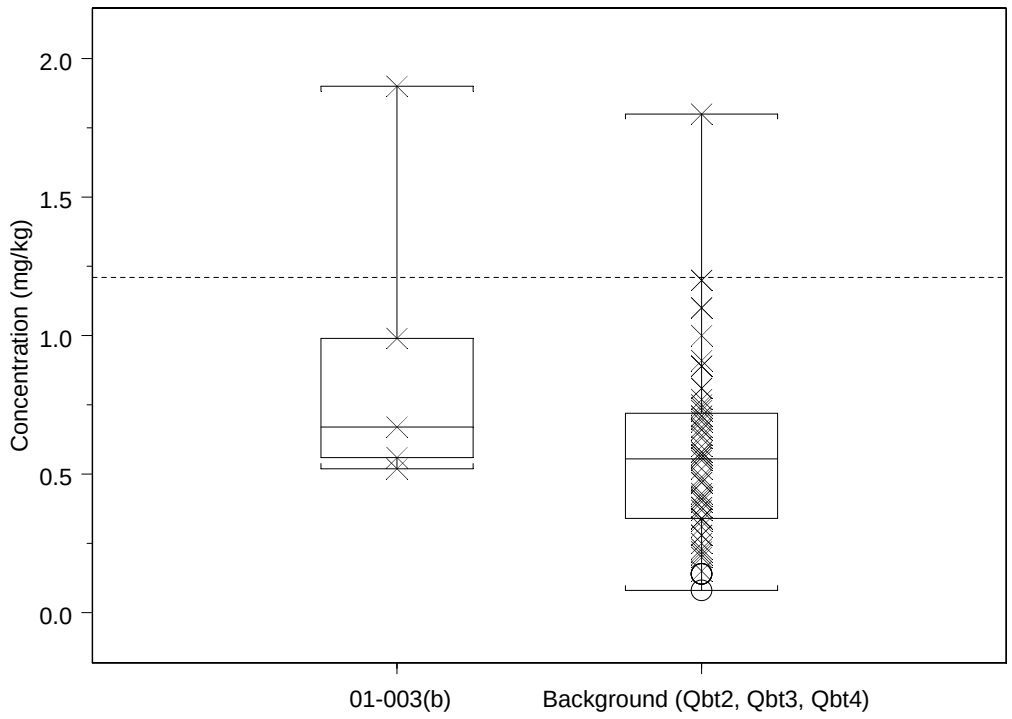


Figure F-3.14-5 Site concentrations of beryllium in tuff at SWMU 01-003(b) compared to background

(× = detect, ○ = nondetect)

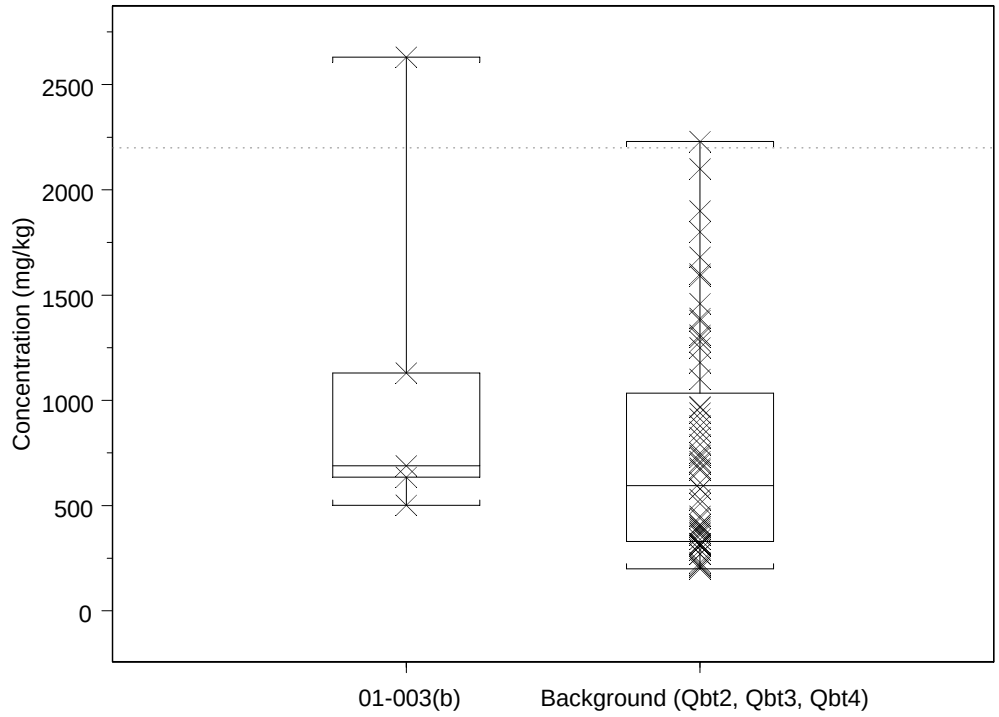


Figure F-3.14-6 Site concentrations of calcium in tuff at SWMU 01-003(b) compared to background

(× = detect, ○ = nondetect)

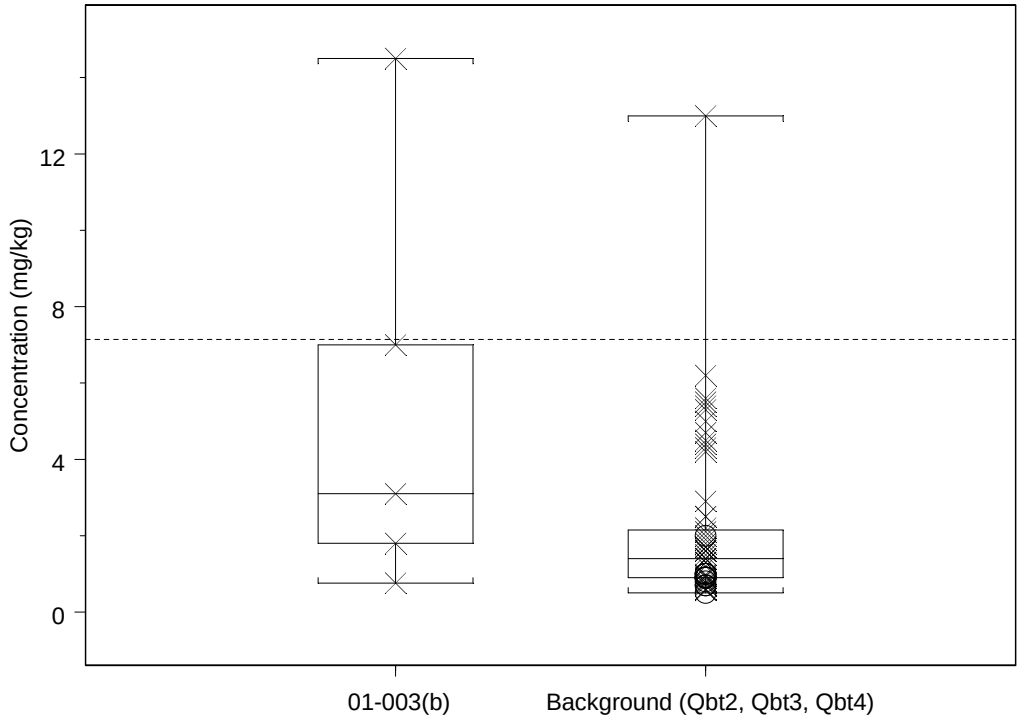


Figure F-3.14-7 Site concentrations of chromium in tuff at SWMU 01-003(b) compared to background

(× = detect, ○ = nondetect)

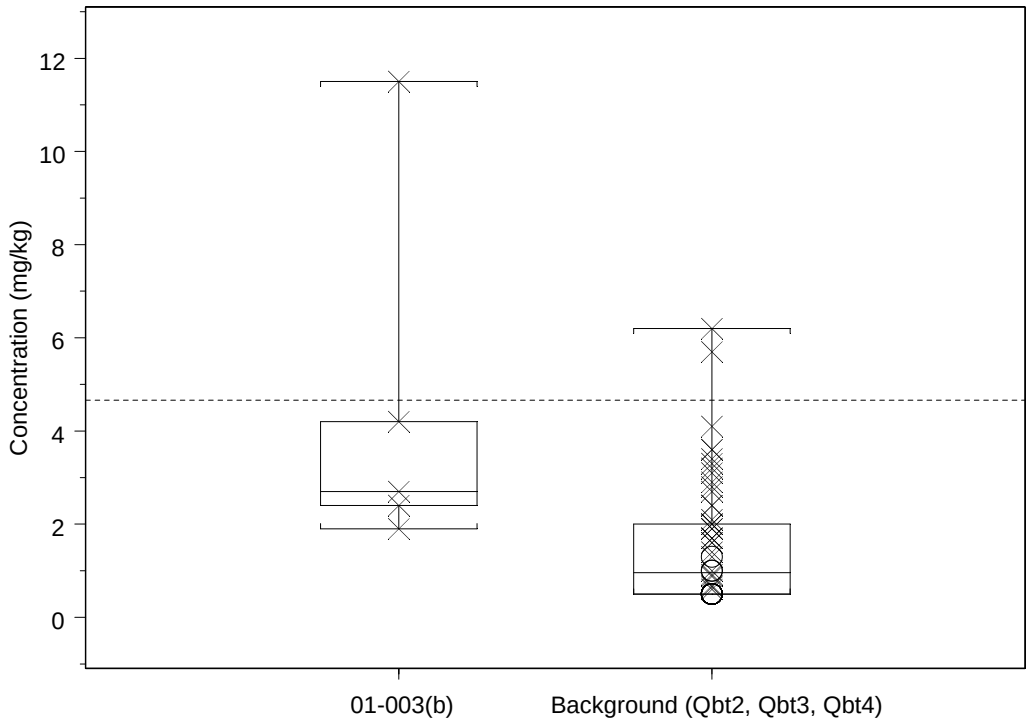


Figure F-3.14-8 Site concentrations of copper in tuff at SWMU 01-003(b) compared to background
(× = detect, ○ = nondetect)

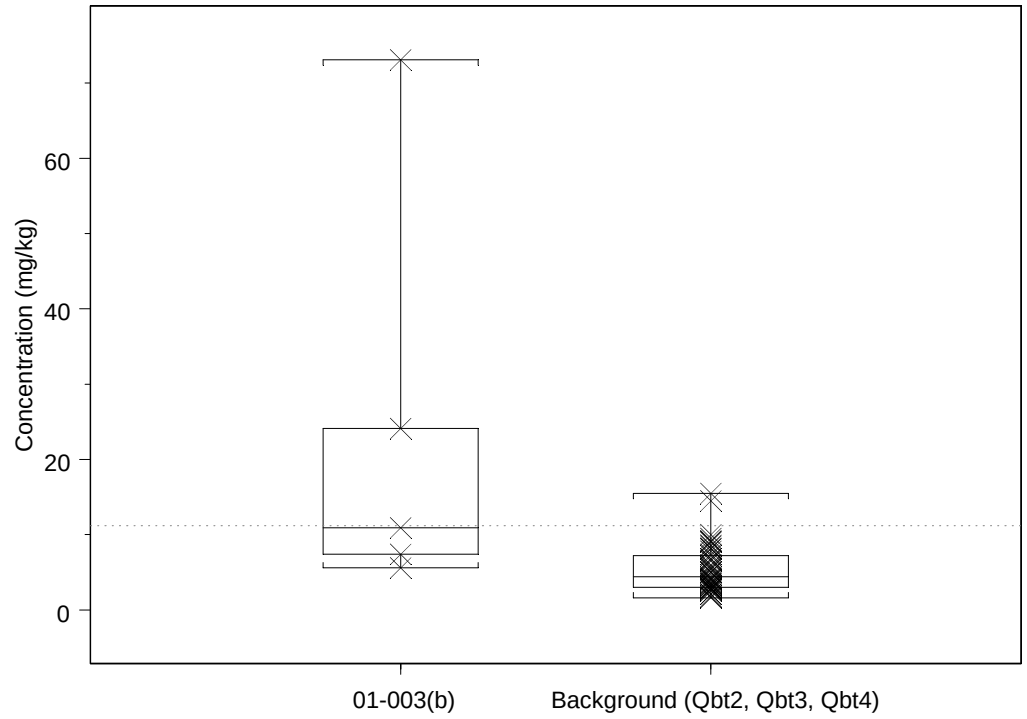


Figure F-3.14-9 Site concentrations of lead in tuff at SWMU 01-003(b) compared to background
(× = detect, ○ = nondetect)

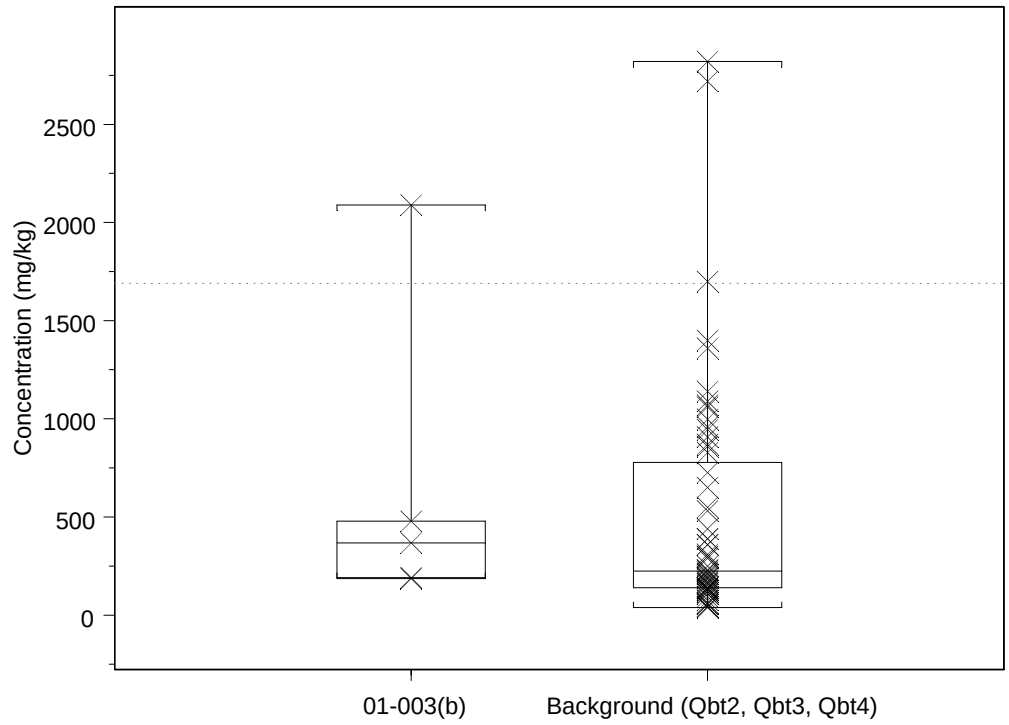


Figure F-3.14-10 Site concentrations of magnesium in tuff at SWMU 01-003(b) compared to background

(× = detect, ○ = nondetect)

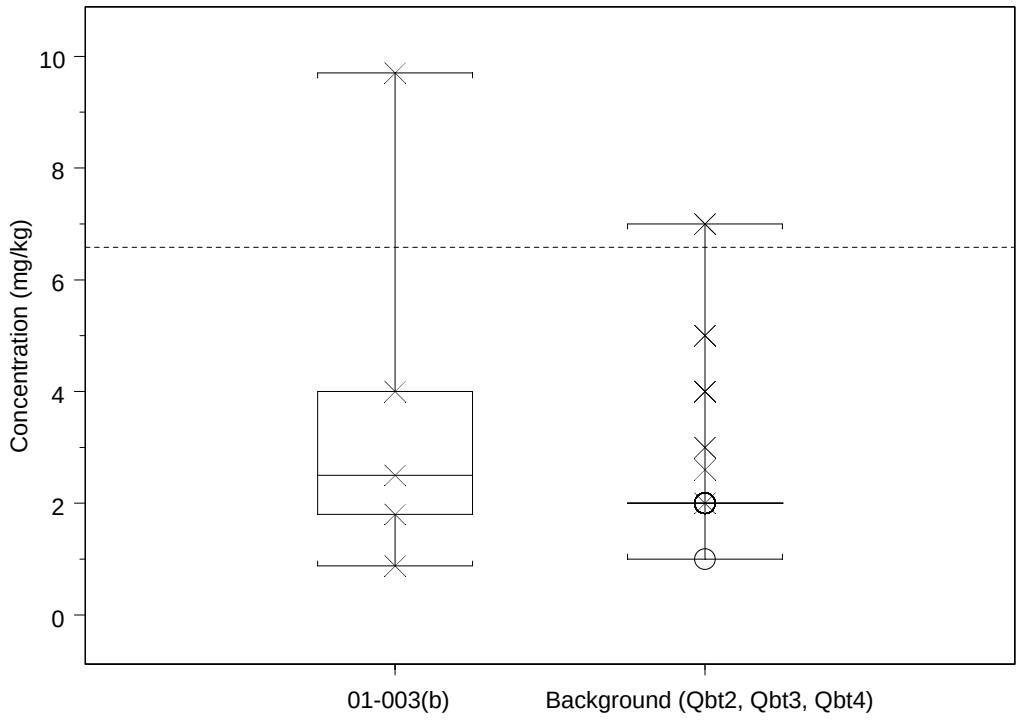


Figure F-3.14-11 Site concentrations of nickel in tuff at SWMU 01-003(b) compared to background

(× = detect, ○ = nondetect)

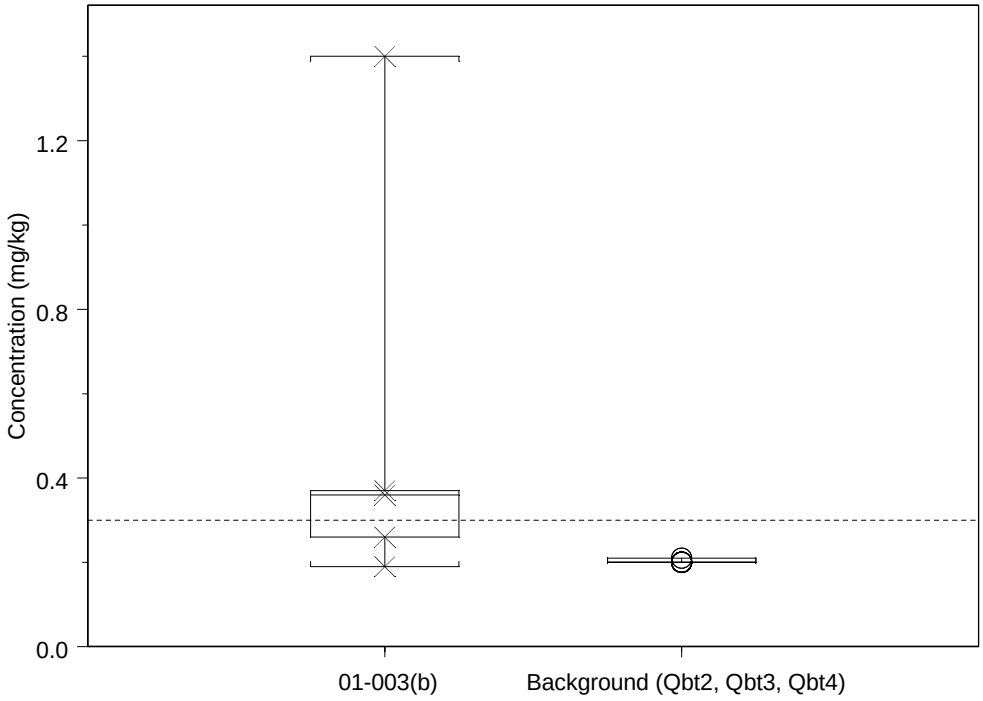


Figure F-3.14-12 Site concentrations of selenium in tuff at SWMU 01-003(b) compared to background

(× = detect, ○ = nondetect)

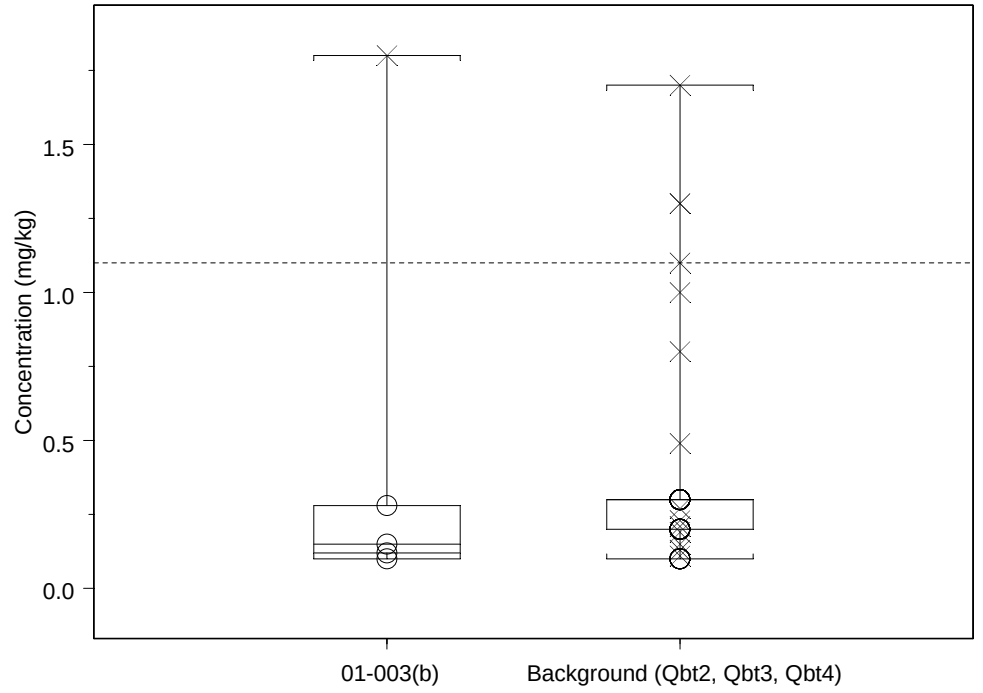


Figure F-3.14-13 Site concentrations of thallium in tuff at SWMU 01-003(b) compared to background

(× = detect, ○ = nondetect)

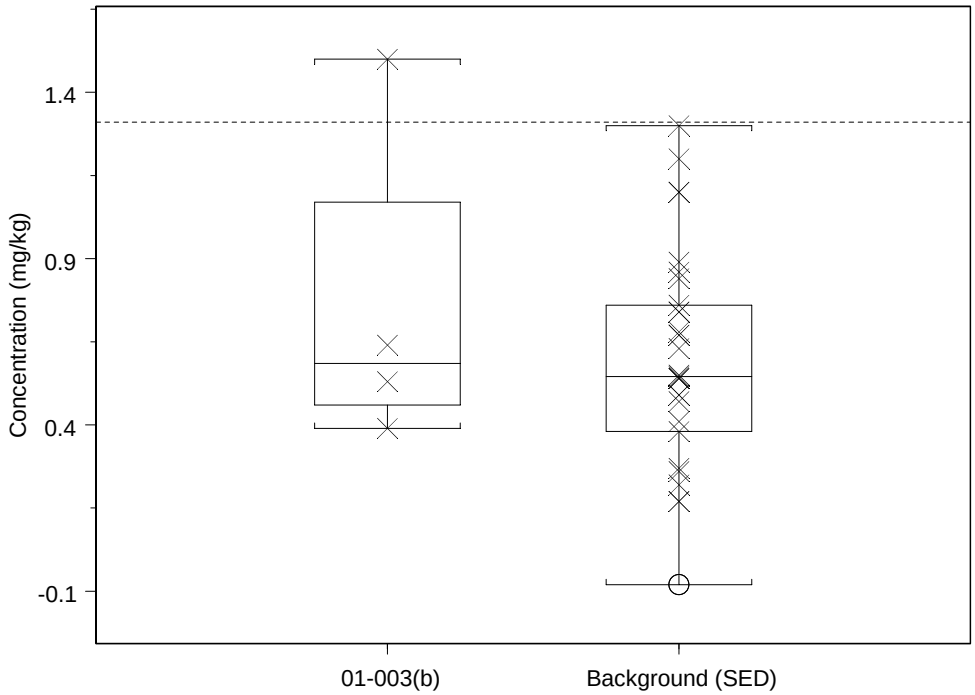


Figure F-3.14-14 Site concentrations of beryllium in sediment at SWMU 01-003(b) compared to background

(× = detect, ○ = nondetect)

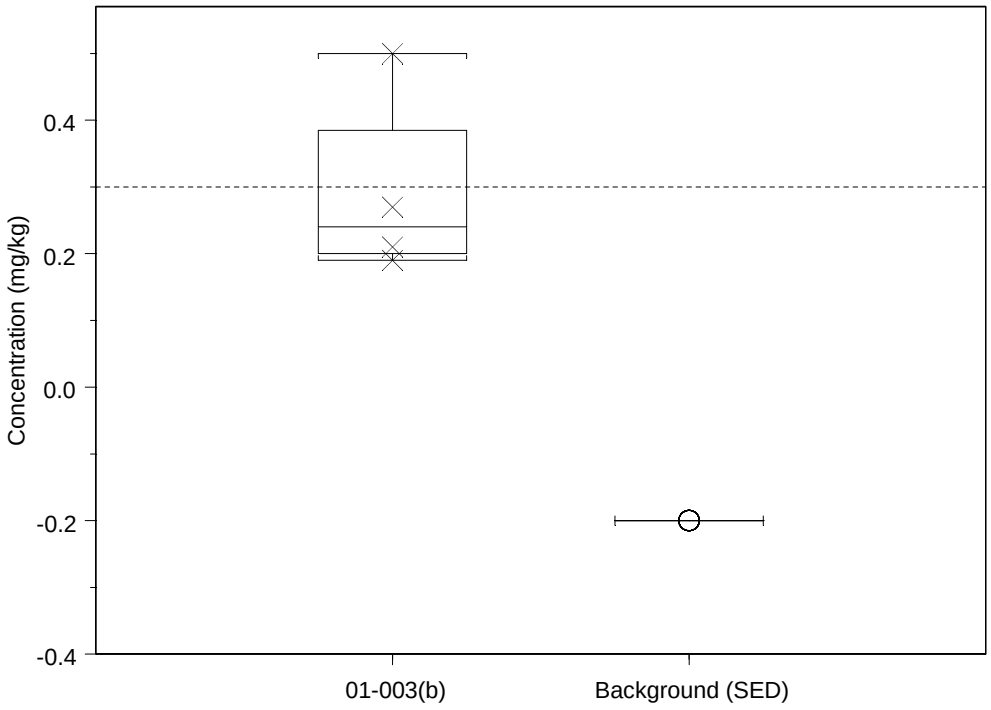


Figure F-3.14-15 Site concentrations of selenium in sediment at SWMU 01-003(b) compared to background

(× = detect, ○ = nondetect)

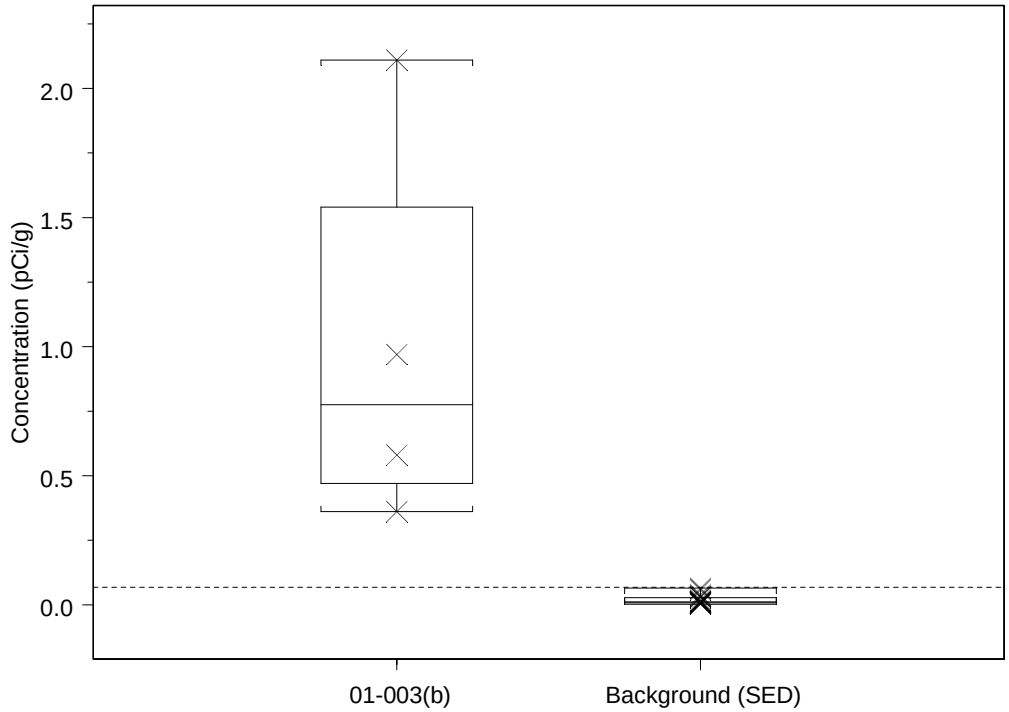


Figure F-3.14-16 Site concentrations of plutonium-239/240 in sediment at SWMU 01-003(b) compared to background

(× = detect, ○ = nondetect)

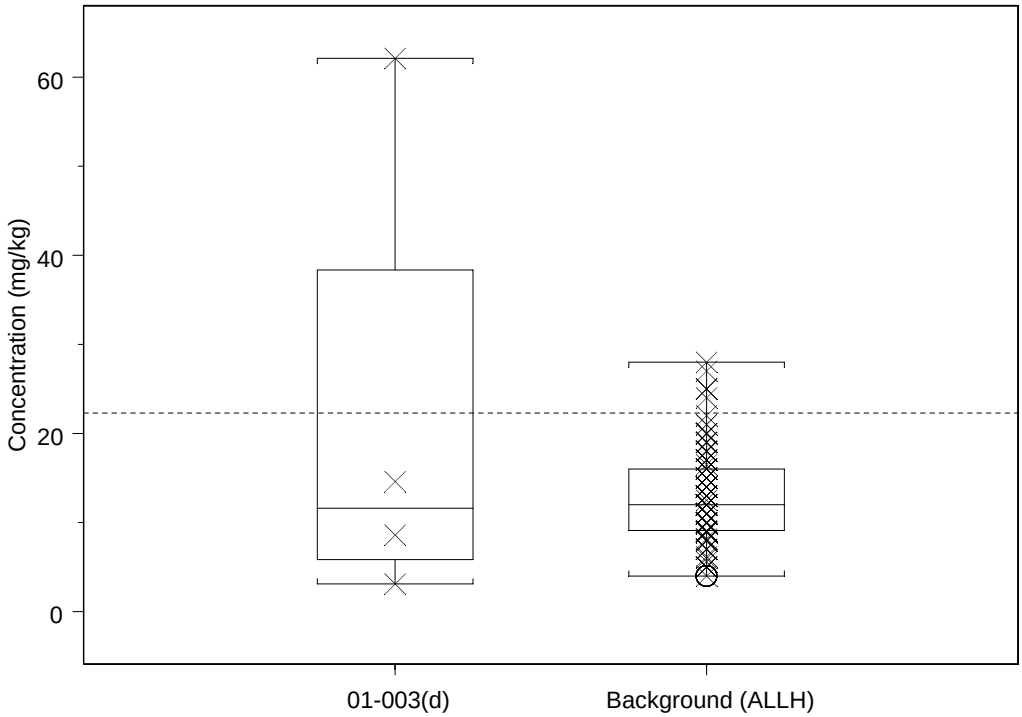


Figure F-3.15-1 Site concentrations of lead in soil at SWMU 01-003(d) compared to background

(× = detect, ○ = nondetect)

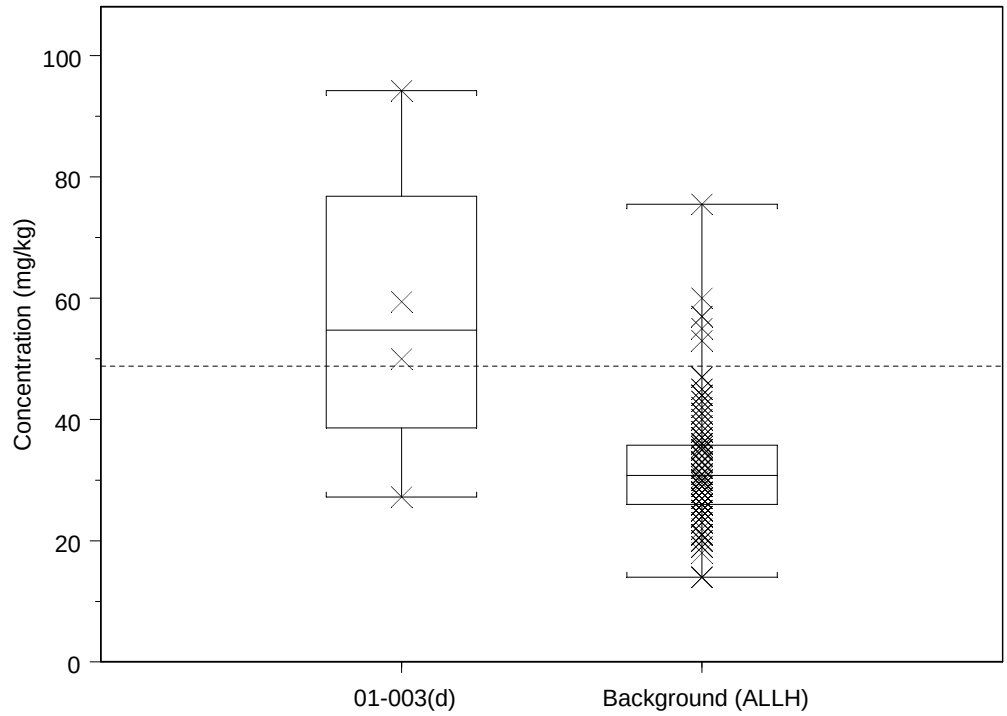


Figure F-3.15-2 Site concentrations of zinc in soil at SWMU 01-003(d) compared to background
(× = detect, ○ = nondetect)

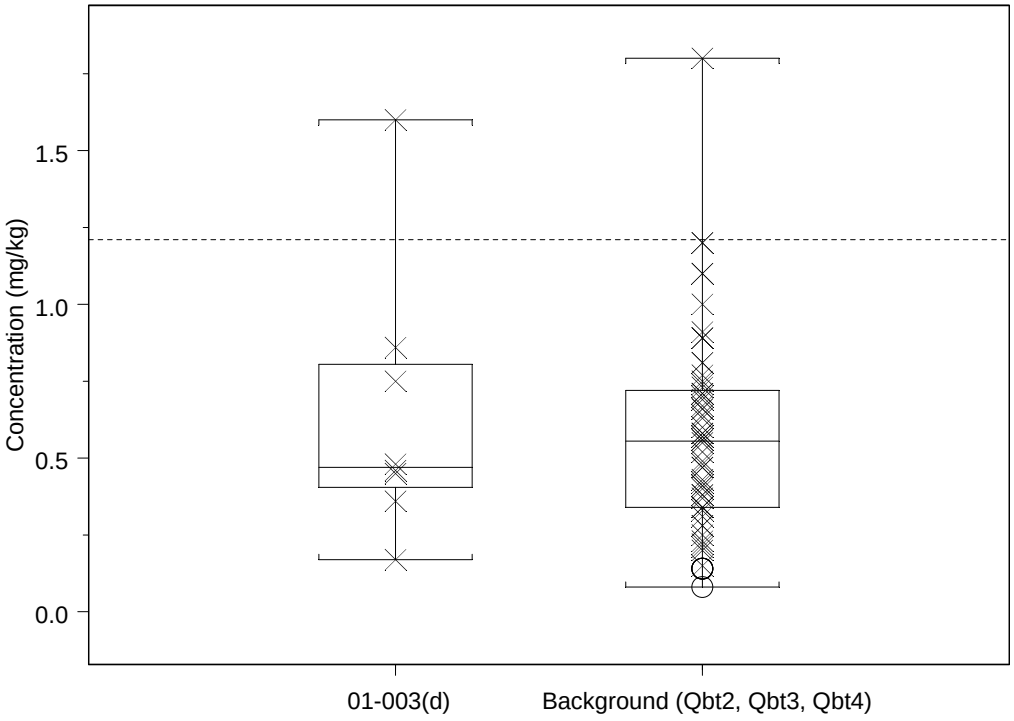


Figure F-3.15-3 Site concentrations of beryllium in tuff at SWMU 01-003(d) compared to background
(× = detect, ○ = nondetect)

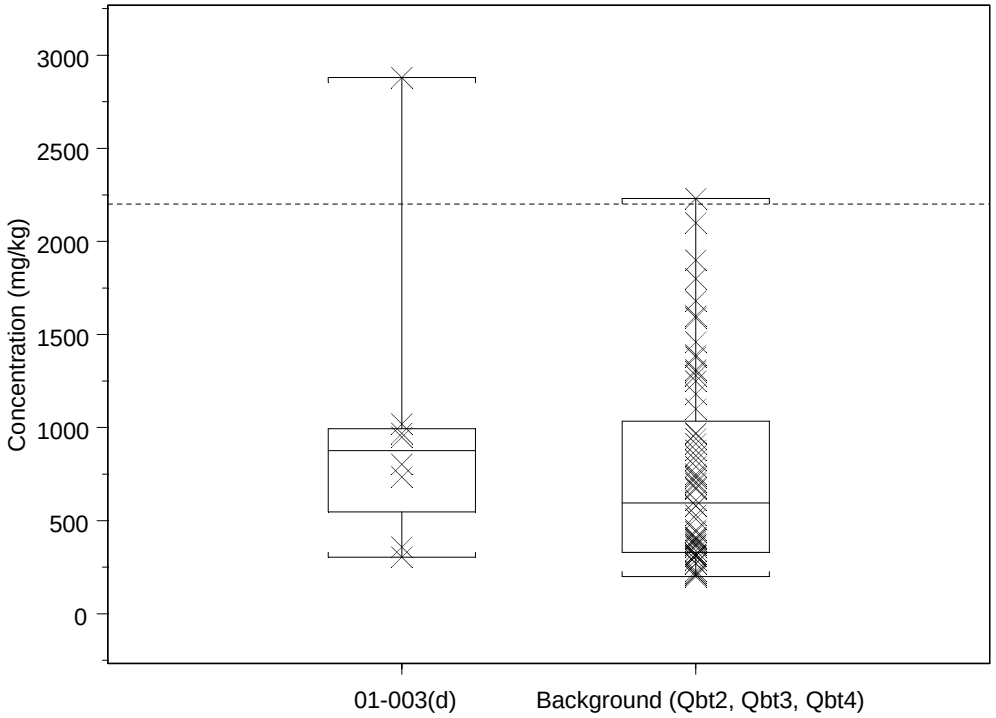


Figure F-3.15-4 Site concentrations of calcium in tuff at SWMU 01-003(d) compared to background

(× = detect, ○ = nondetect)

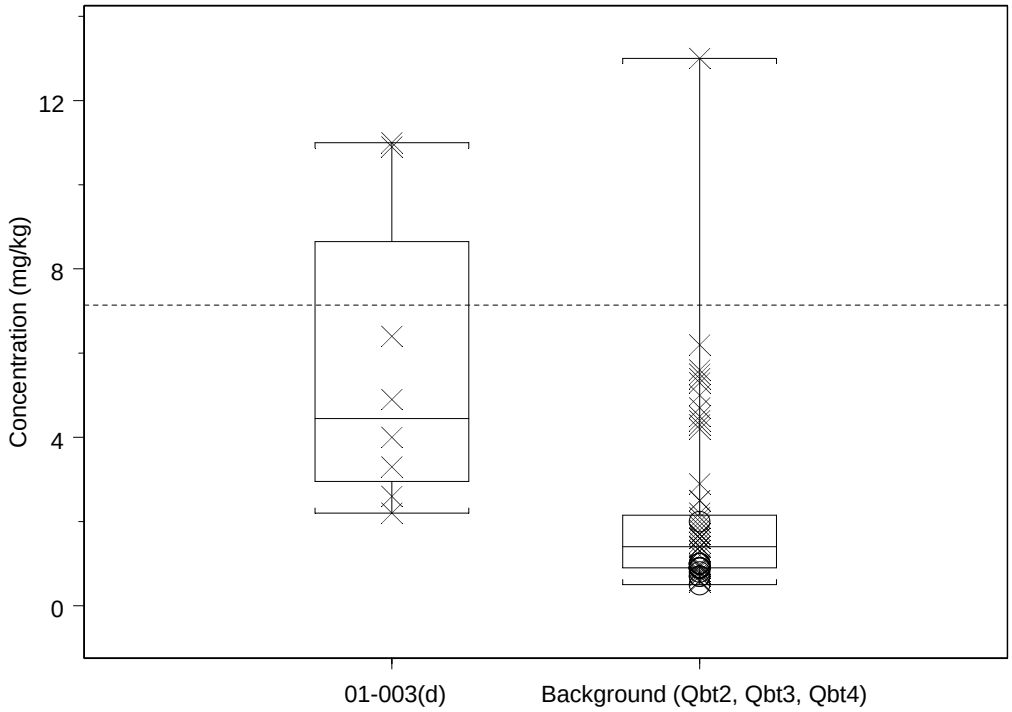


Figure F-3.15-5 Site concentrations of chromium in tuff at SWMU 01-003(d) compared to background

(× = detect, ○ = nondetect)

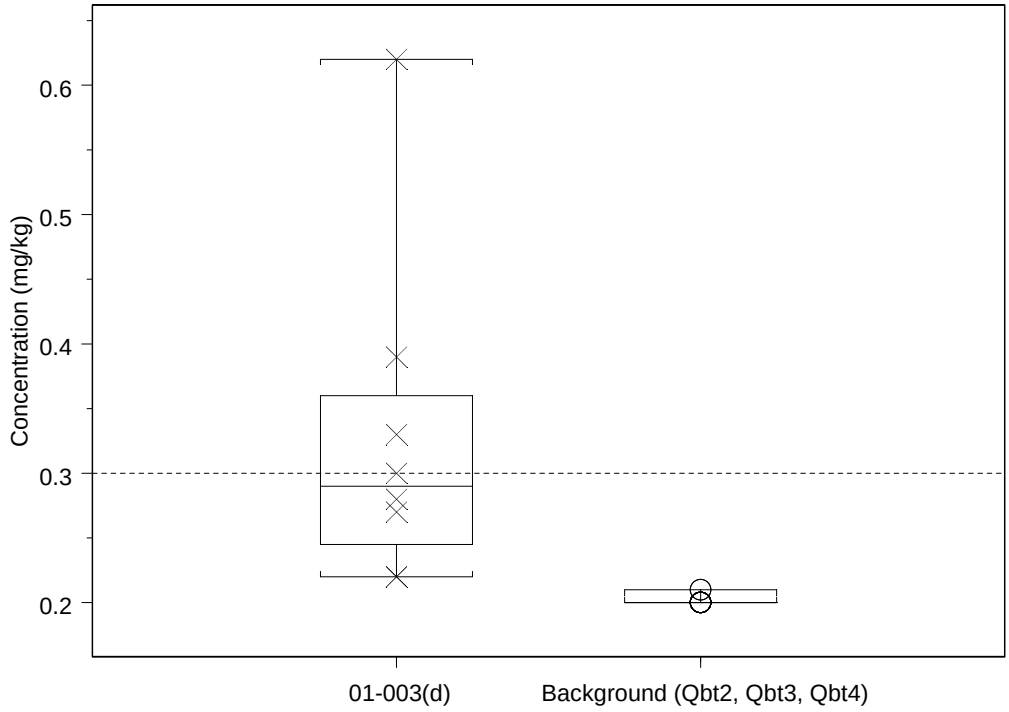


Figure F-3.15-6 Site concentrations of selenium in tuff at SWMU 01-003(d) compared to background

(× = detect, ○ = nondetect)

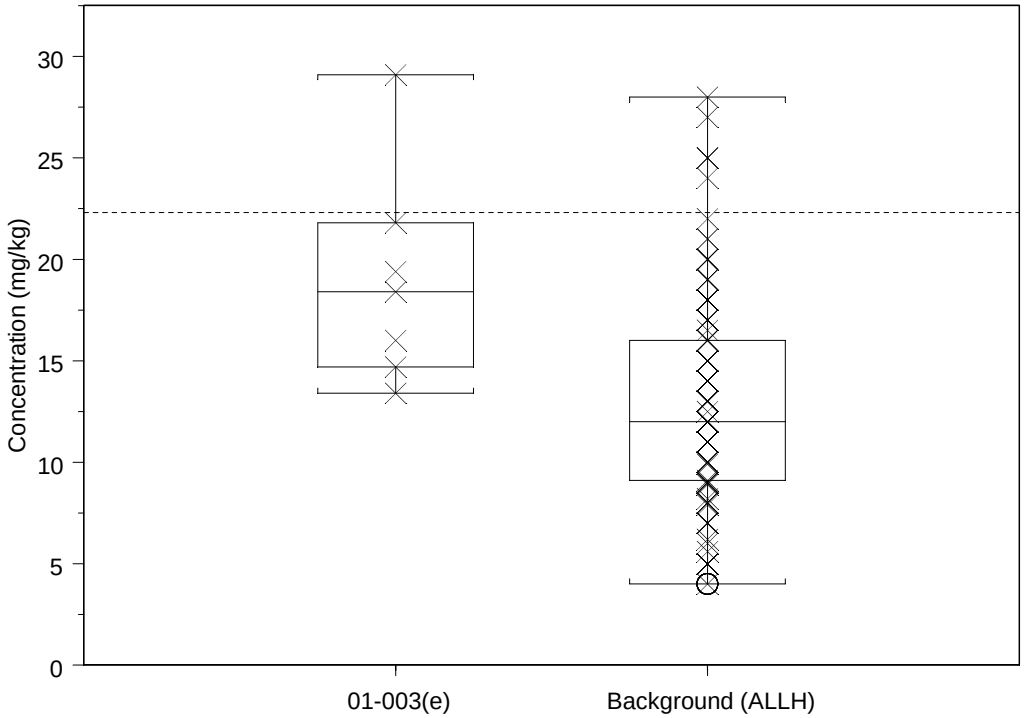


Figure F-3.16-1 Site concentrations of lead in soil at SWMU 01-003(e) compared to background

(× = detect, ○ = nondetect)

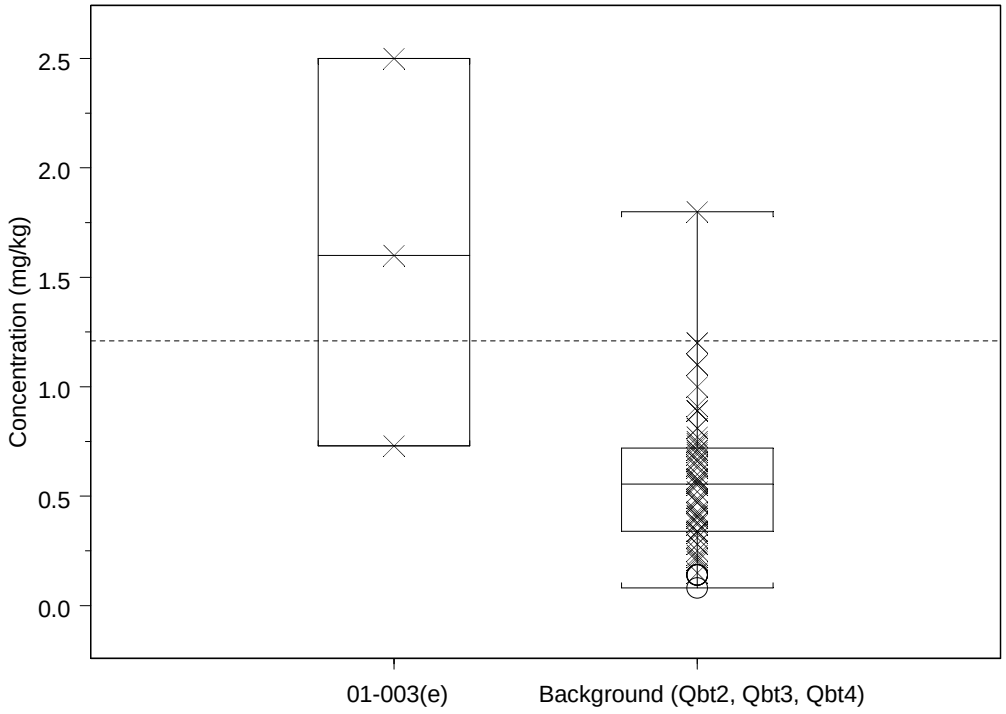


Figure F-3.16-2 Site concentrations of beryllium in tuff at SWMU 01-003(e) compared to background

(× = detect, ○ = nondetect)

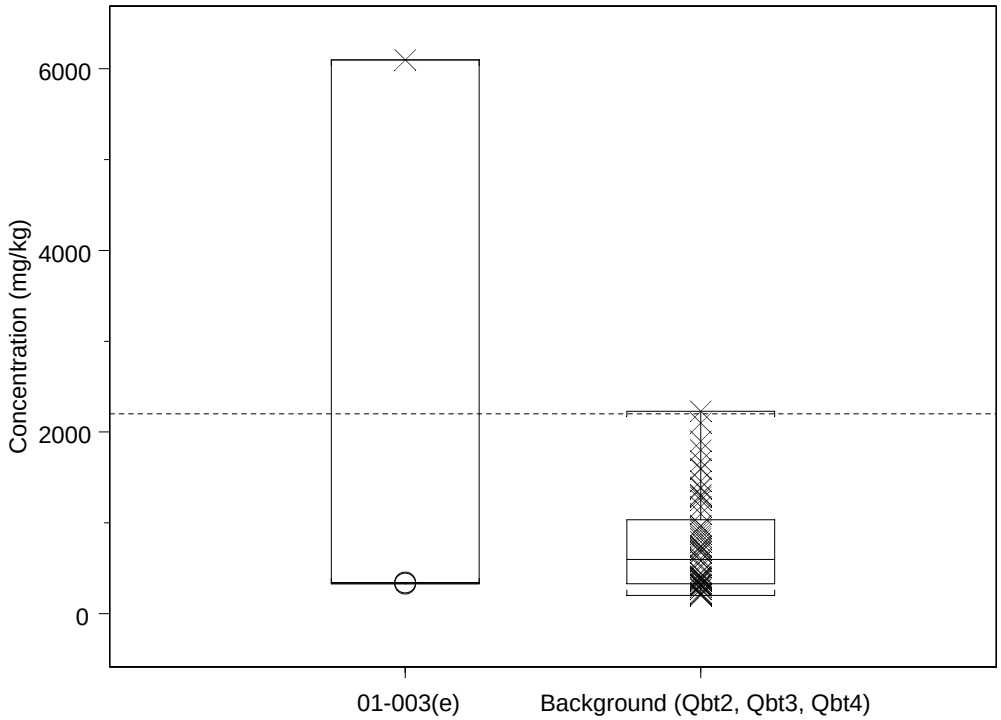


Figure F-3.16-3 Site concentrations of calcium in tuff at SWMU 01-003(e) compared to background

(× = detect, ○ = nondetect)

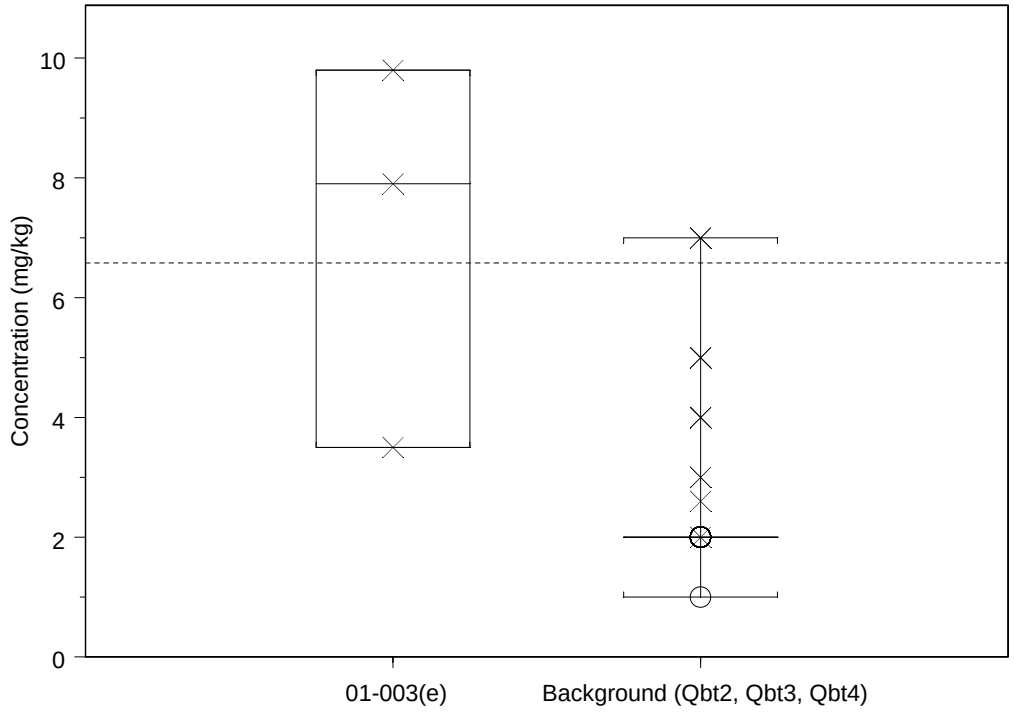


Figure F-3.16-4 Site concentrations of nickel in tuff at SWMU 01-003(e) compared to background

(× = detect, ○ = nondetect)

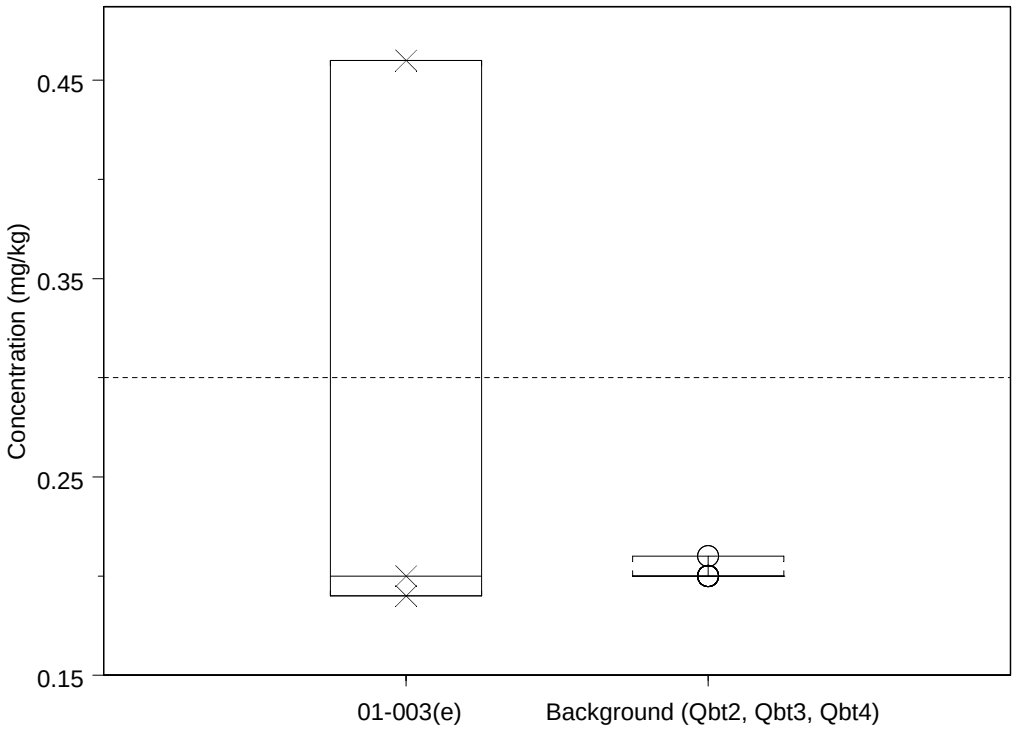


Figure F-3.16-5 Site concentrations of selenium in tuff at SWMU 01-003(e) compared to background

(× = detect, ○ = nondetect)

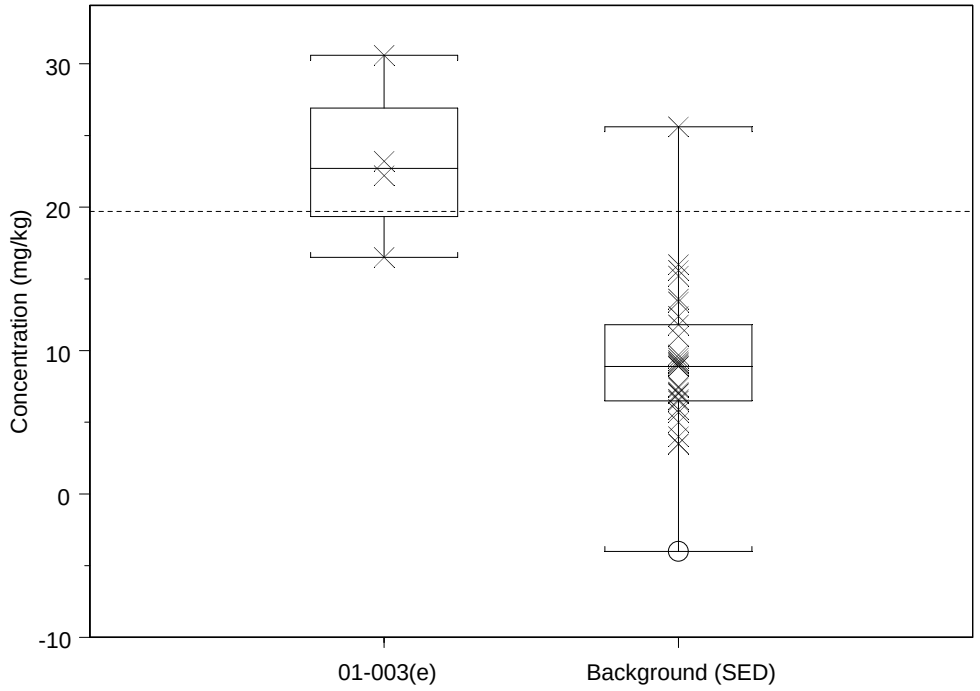


Figure F-3.16-6 Site concentrations of lead in sediment at SWMU 01-003(e) compared to background

(× = detect, ○ = nondetect)

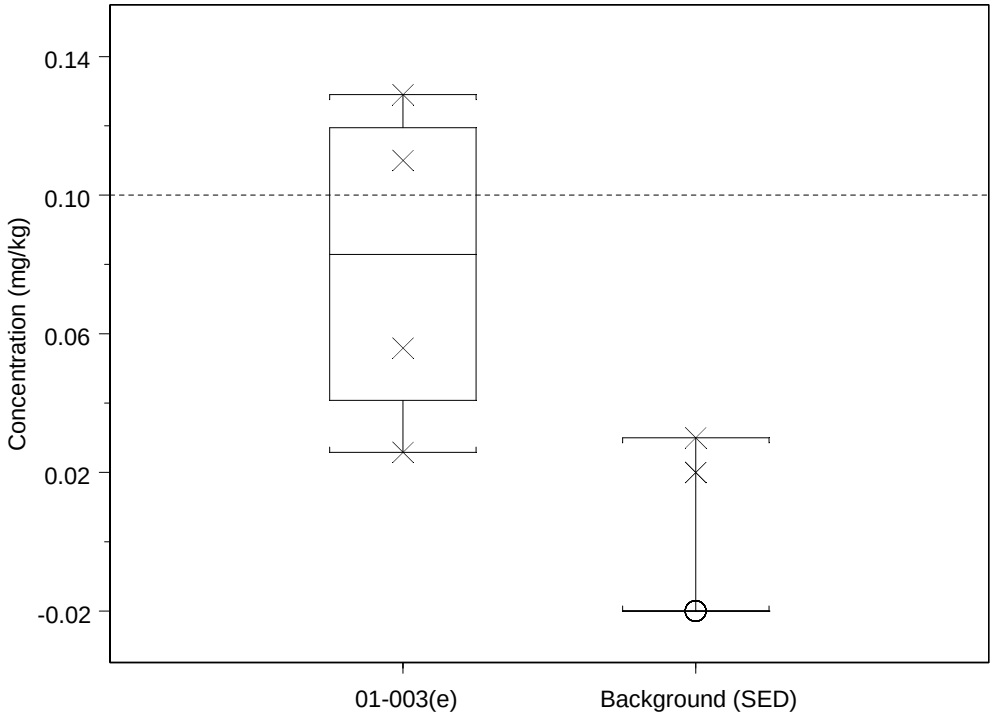


Figure F-3.16-7 Site concentrations of mercury in sediment at SWMU 01-003(e) compared to background

(× = detect, ○ = nondetect)

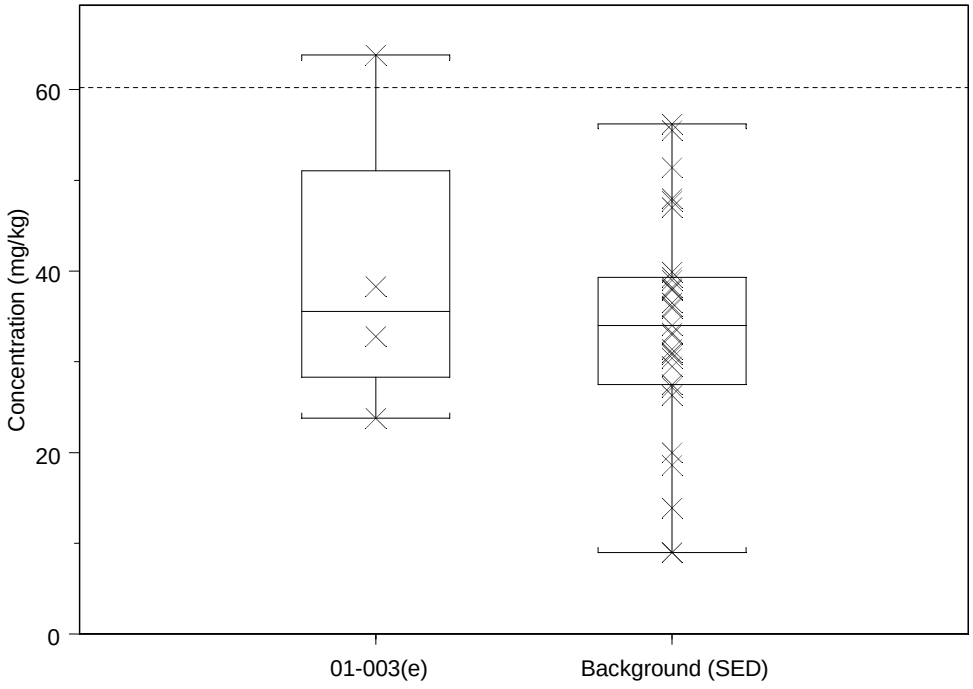


Figure F-3.16-8 Site concentrations of zinc in sediment at SWMU 01-003(e) compared to background

(× = detect, ○ = nondetect)

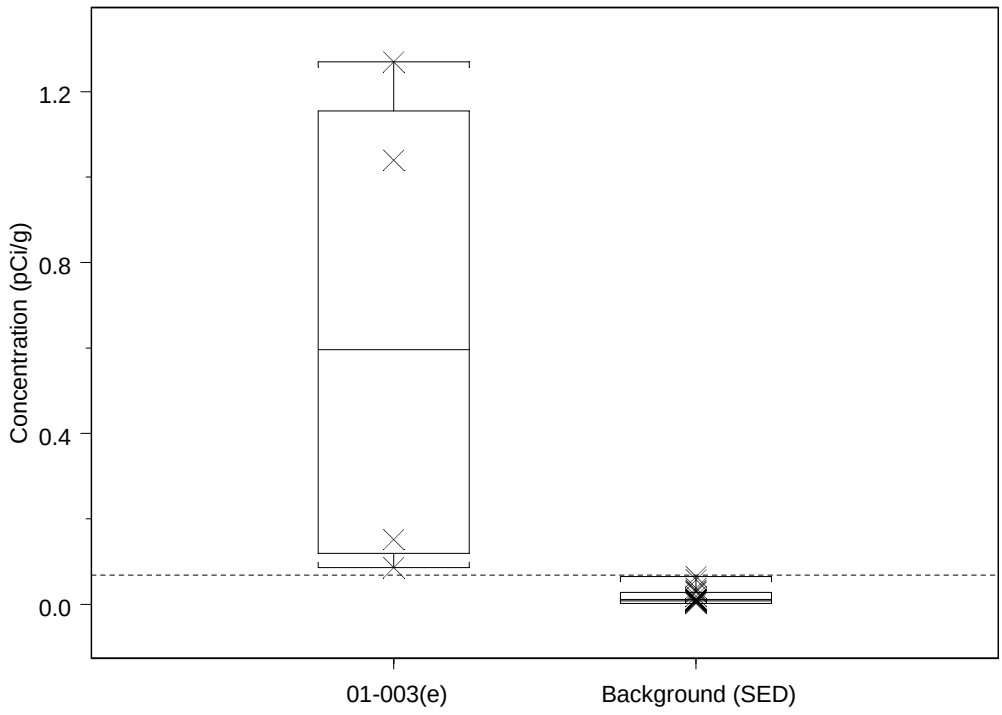


Figure F-3.16-9 Site concentrations of plutonium-239/240 in sediment at SWMU 01-003(e) compared to background

(× = detect, ○ = nondetect)

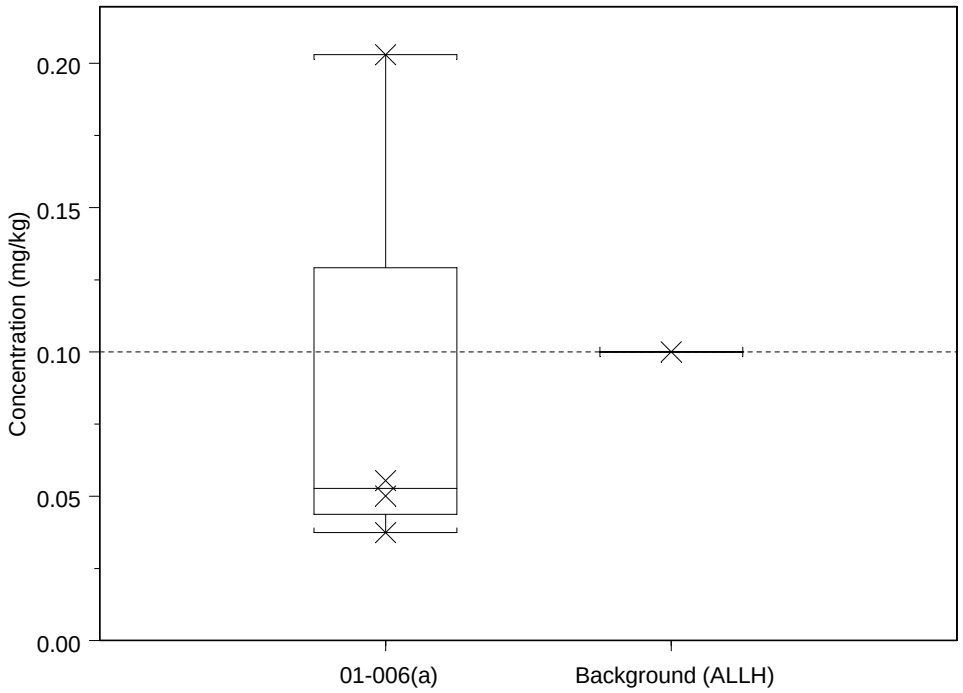


Figure F-3.17-1 Site concentrations of mercury in soil at SWMU 01-006(a) compared to background

(× = detect, ○ = nondetect)

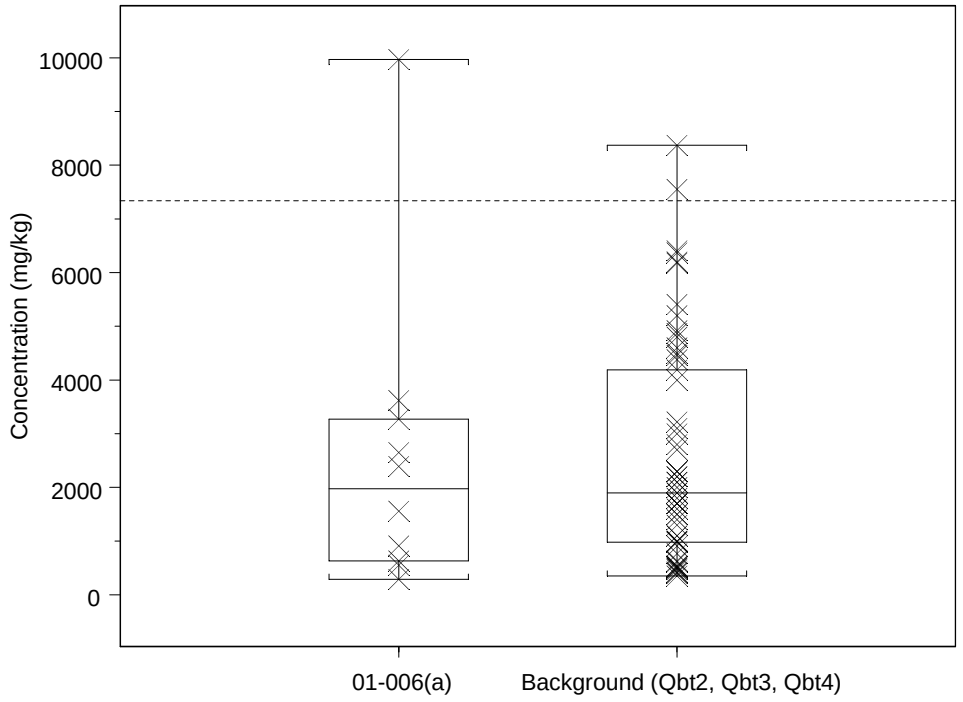


Figure F-3.17-2 Site concentrations of aluminum in tuff at SWMU 01-006(a) compared to background

(× = detect, ○ = nondetect)

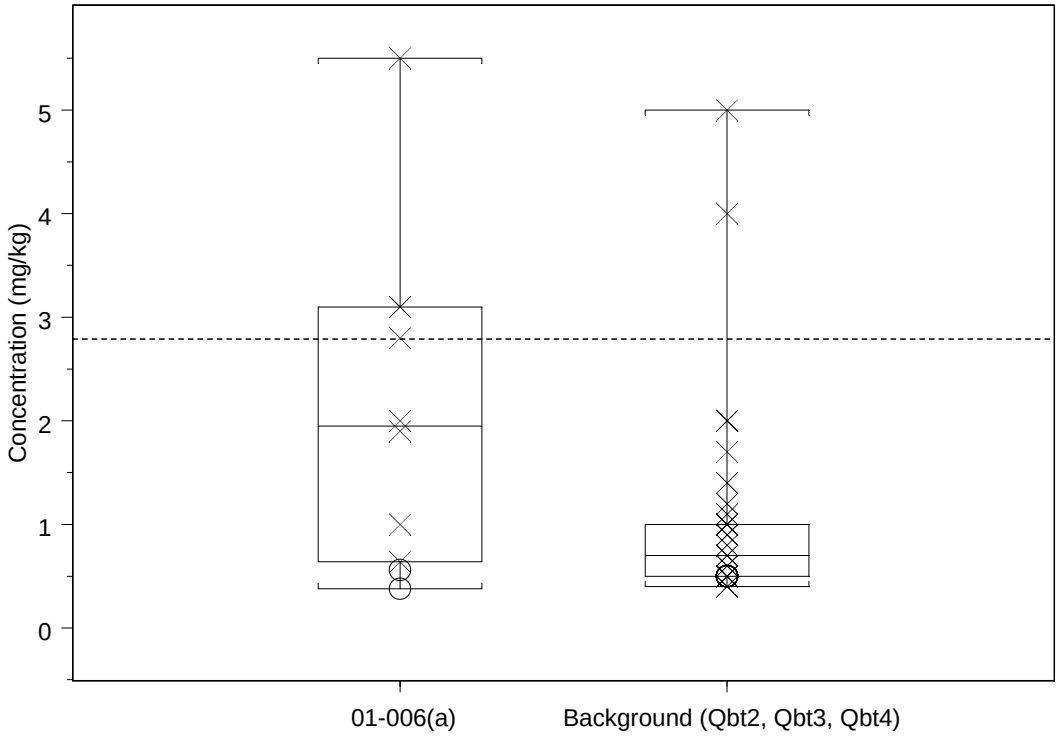


Figure F-3.17-3 Site concentrations of arsenic in tuff at SWMU 01-006(a) compared to background
(× = detect, ○ = nondetect)

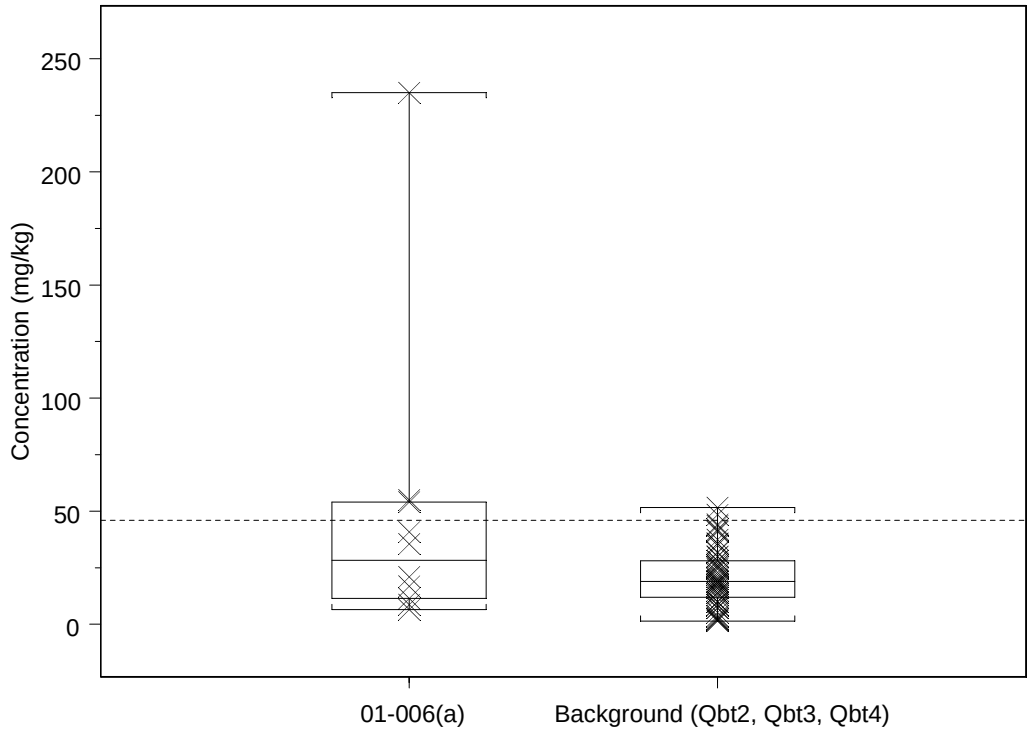


Figure F-3.17-4 Site concentrations of barium in tuff at SWMU 01-006(a) compared to background
(× = detect, ○ = nondetect)

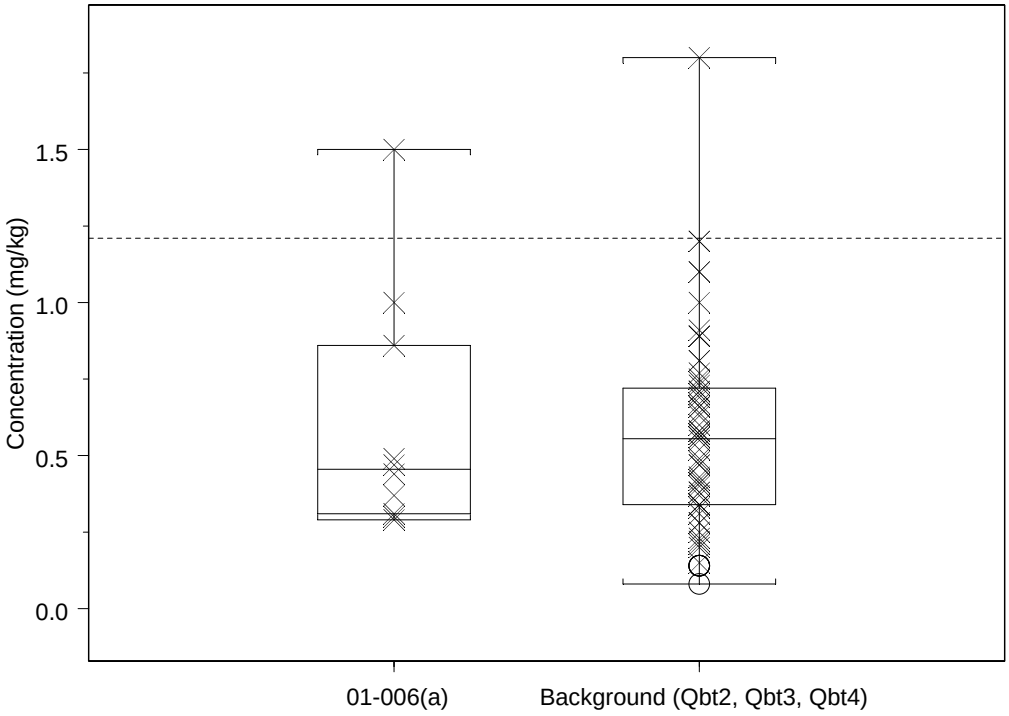


Figure F-3.17-5 Site concentrations of beryllium in tuff at SWMU 01-006(a) compared to background

(× = detect, ○ = nondetect)

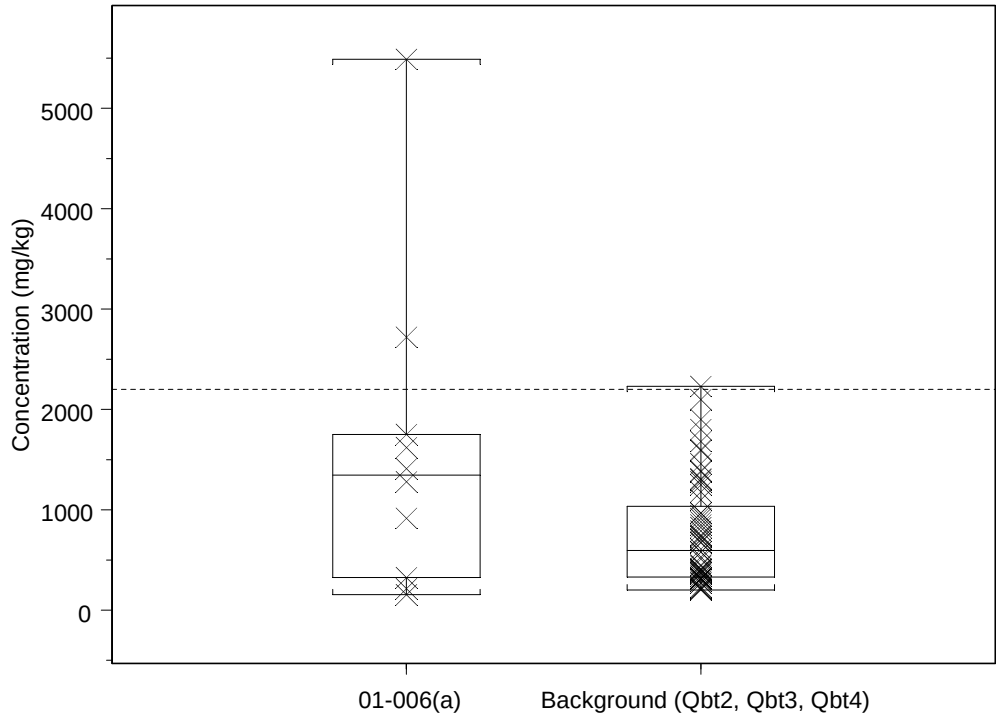


Figure F-3.17-6 Site concentrations of calcium in tuff at SWMU 01-006(a) compared to background

(× = detect, ○ = nondetect)

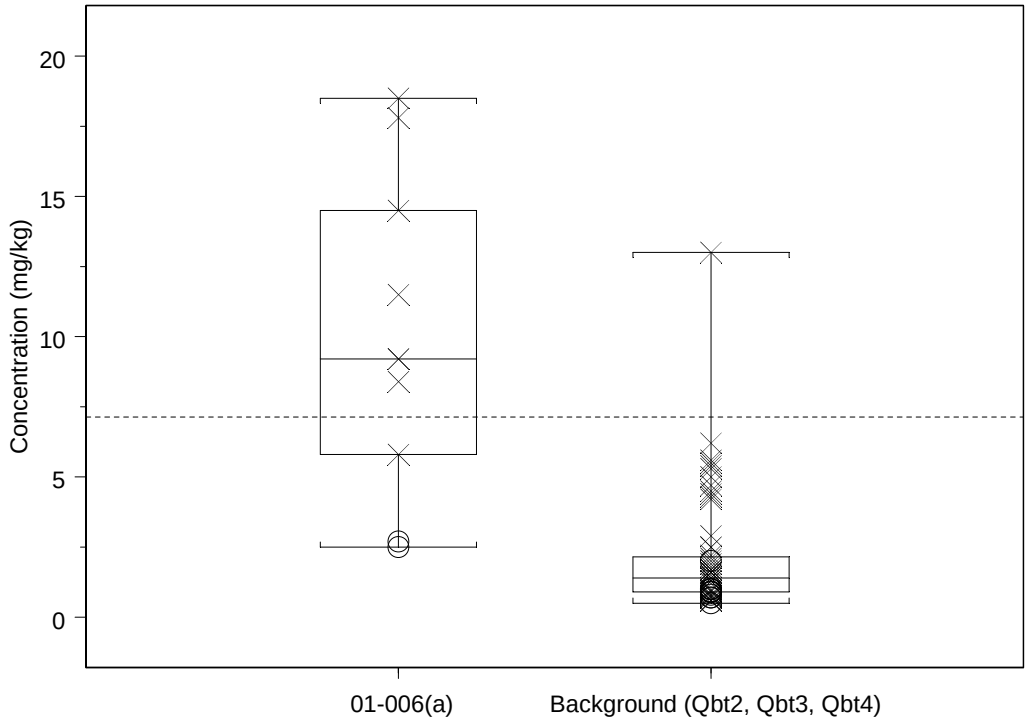


Figure F-3.17-7 Site concentrations of chromium in tuff at SWMU 01-006(a) compared to background

(× = detect, ○ = nondetect)

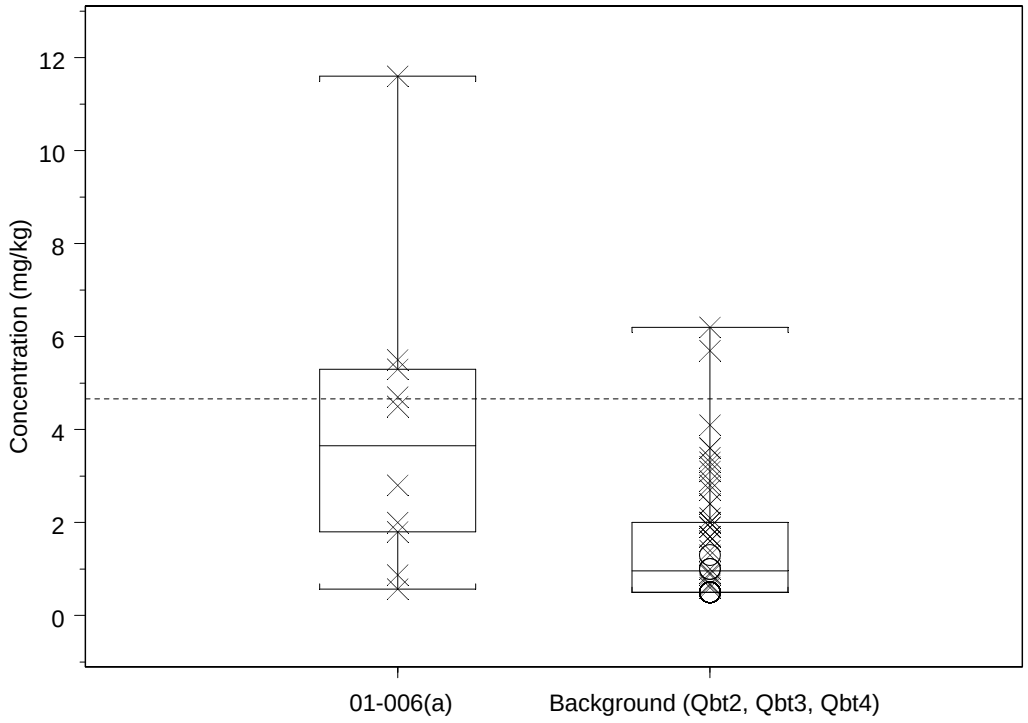


Figure F-3.17-8 Site concentrations of copper in tuff at SWMU 01-006(a) compared to background

(× = detect, ○ = nondetect)

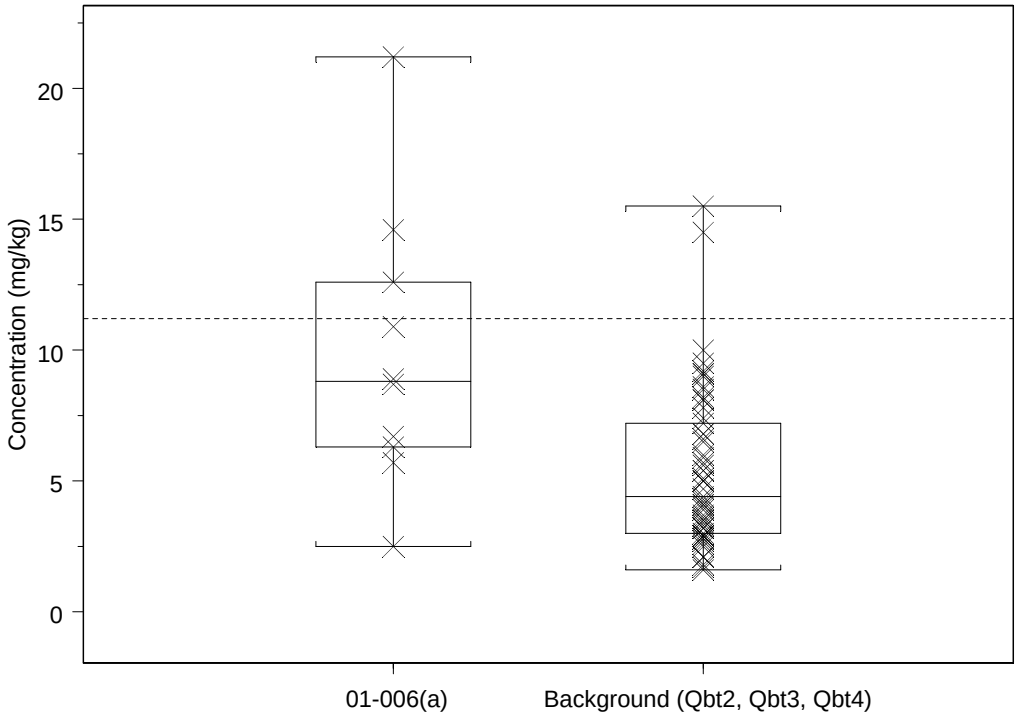


Figure F-3.17-9 Site concentrations of lead in tuff at SWMU 01-006(a) compared to background
(× = detect, ○ = nondetect)

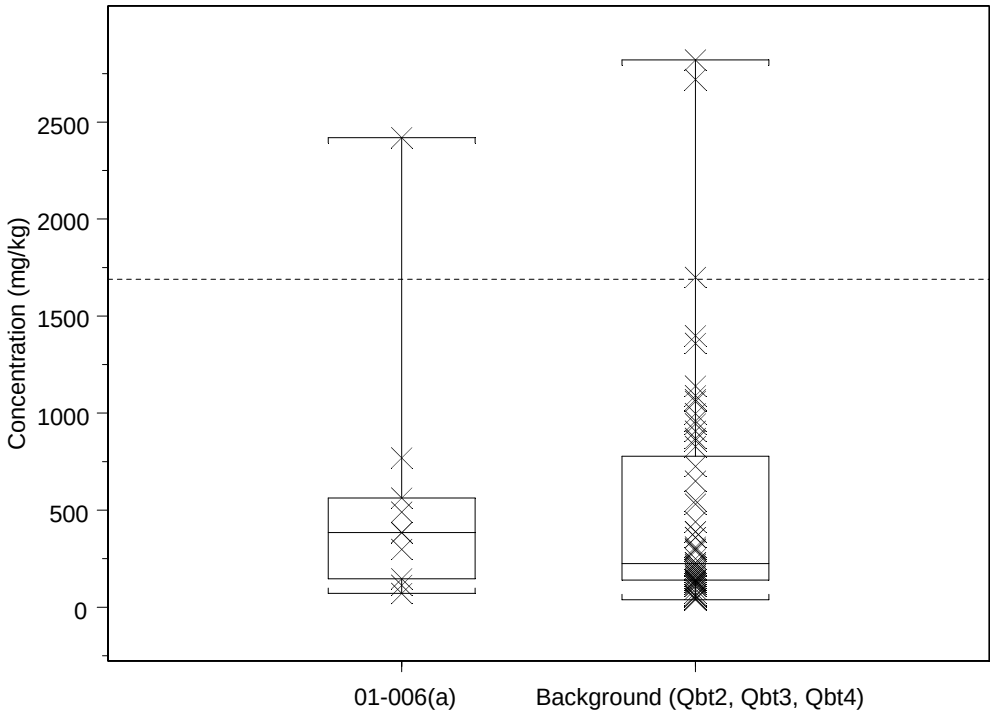


Figure F-3.17-10 Site concentrations of magnesium in tuff at SWMU 01-006(a) compared to background
(× = detect, ○ = nondetect)

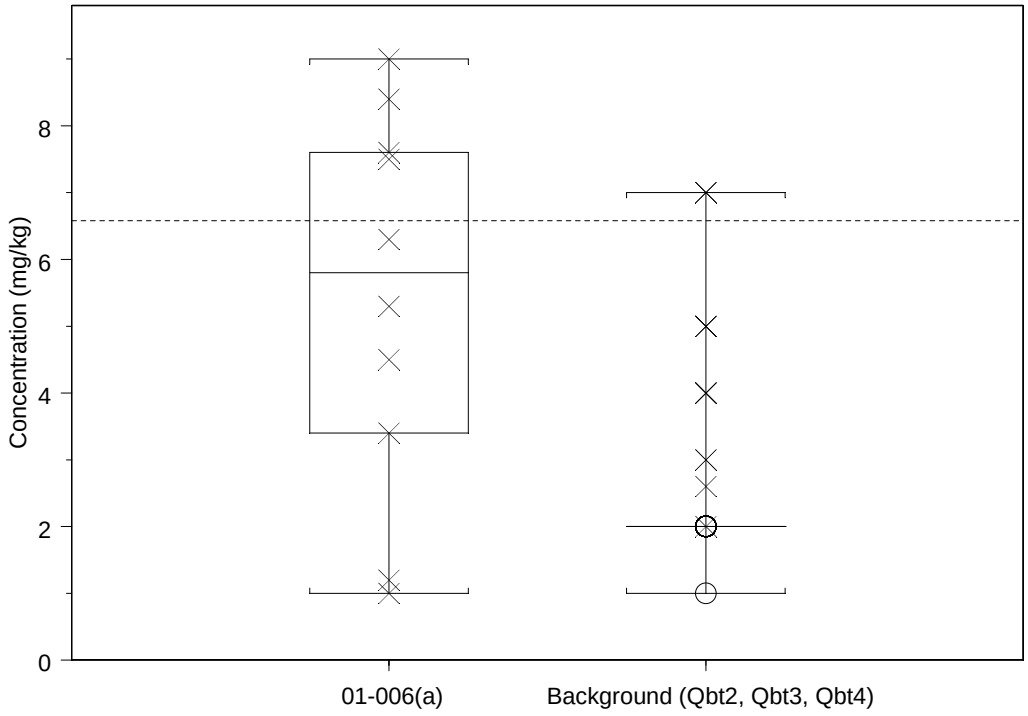


Figure F-3.17-11 Site concentrations of nickel in tuff at SWMU 01-006(a) compared to background
(× = detect, ○ = nondetect)

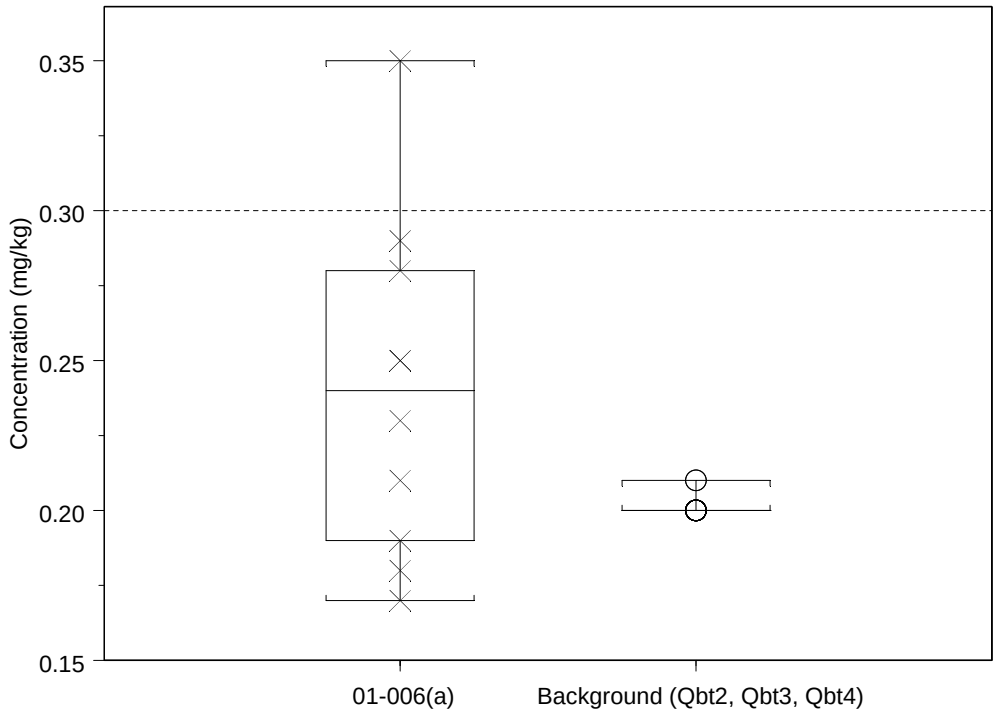


Figure F-3.17-12 Site concentrations of selenium in tuff at SWMU 01-006(a) compared to background
(× = detect, ○ = nondetect)

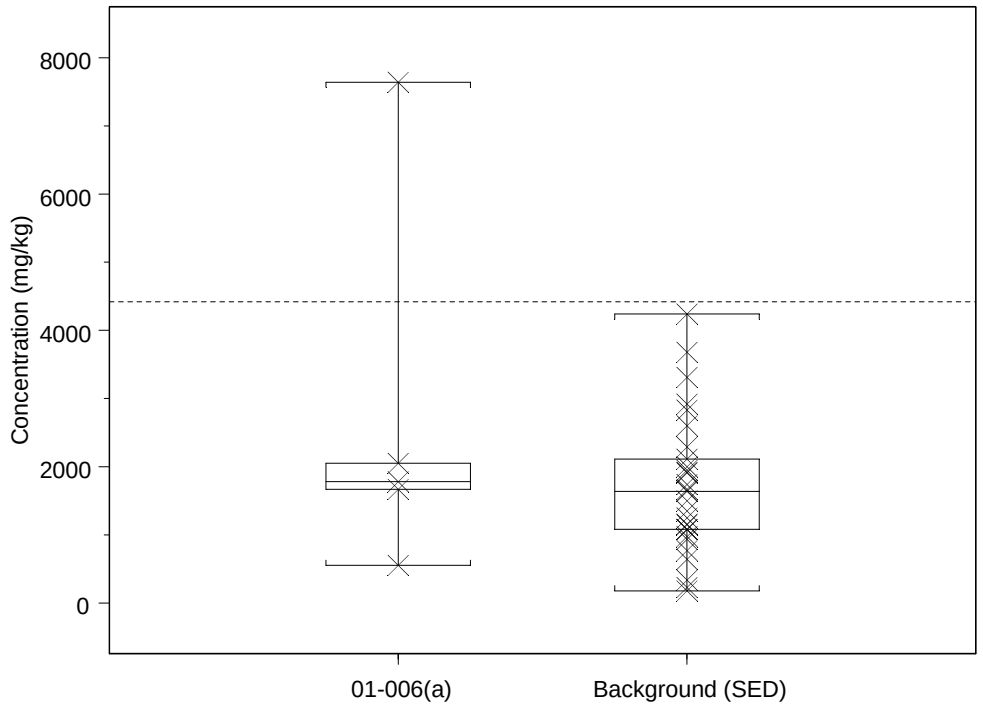


Figure F-3.17-13 Site concentrations of calcium in sediment at SWMU 01-006(a) compared to background

(× = detect, ○ = nondetect)

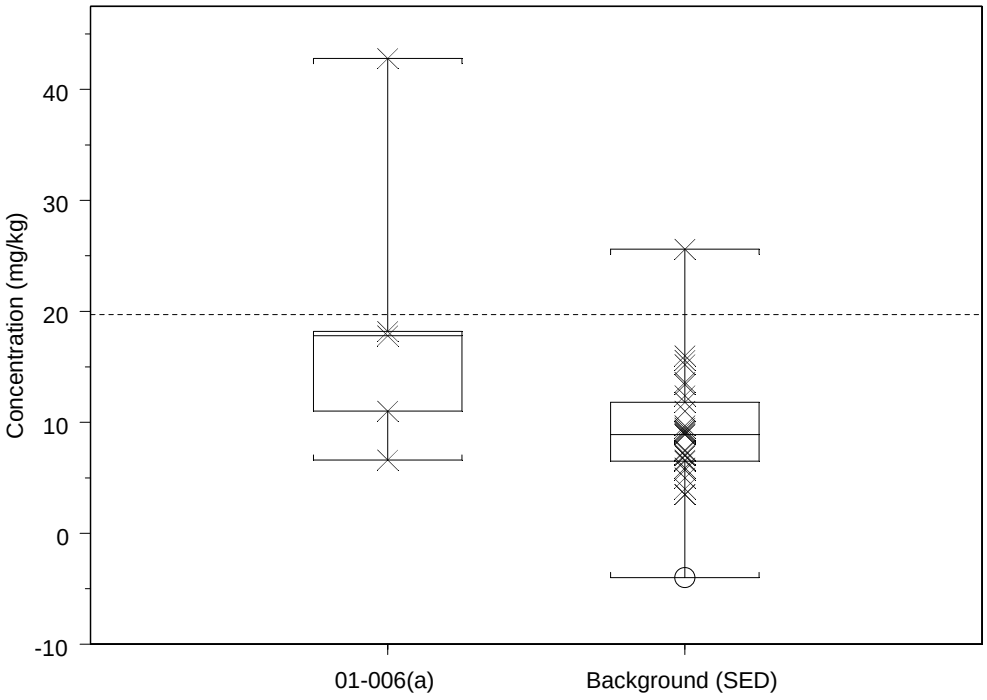


Figure F-3.17-14 Site concentrations of lead in sediment at SWMU 01-006(a) compared to background

(× = detect, ○ = nondetect)

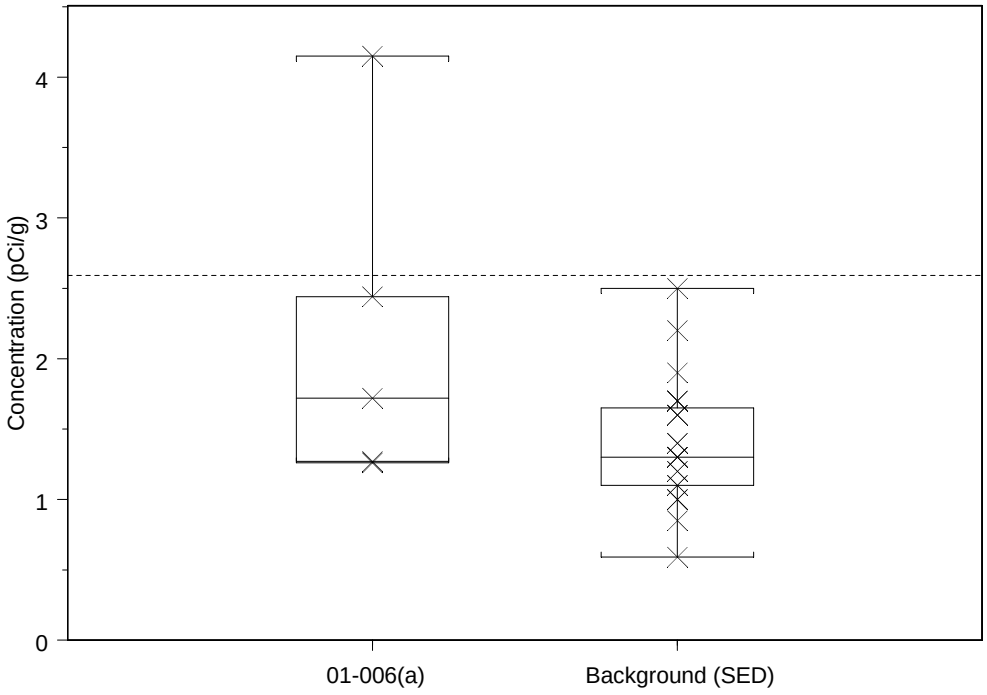


Figure F-3.17-15 Site concentrations of uranium-234 in sediment at SWMU 01-006(a) compared to background

(× = detect, ○ = nondetect)

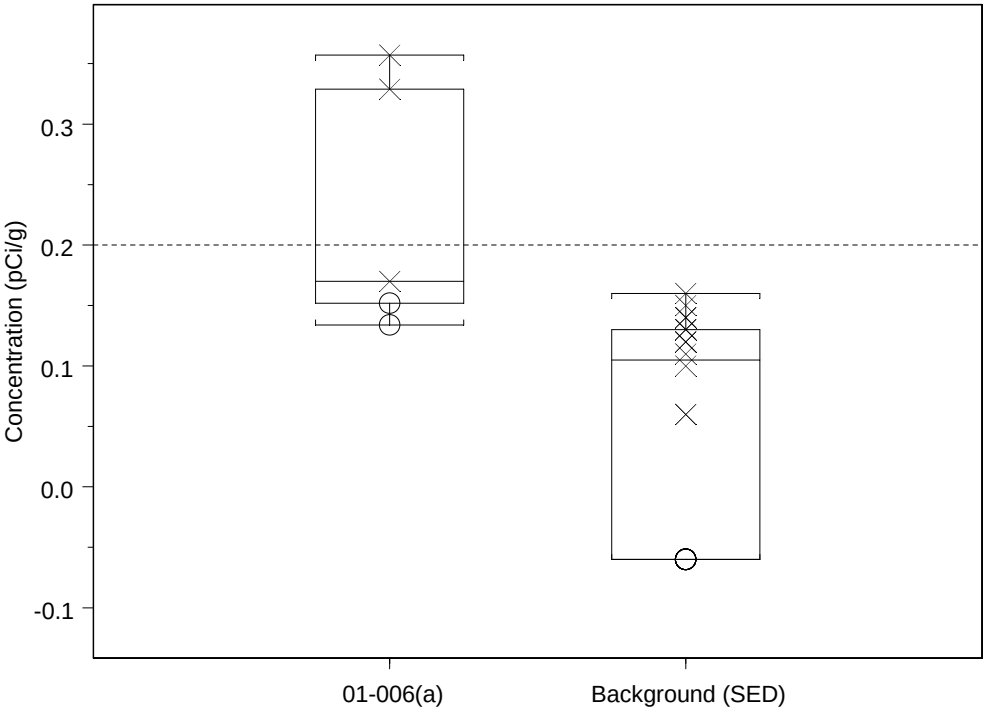


Figure F-3.17-16 Site concentrations of uranium-235/236 in sediment at SWMU 01-006(a) compared to background

(× = detect, ○ = nondetect)

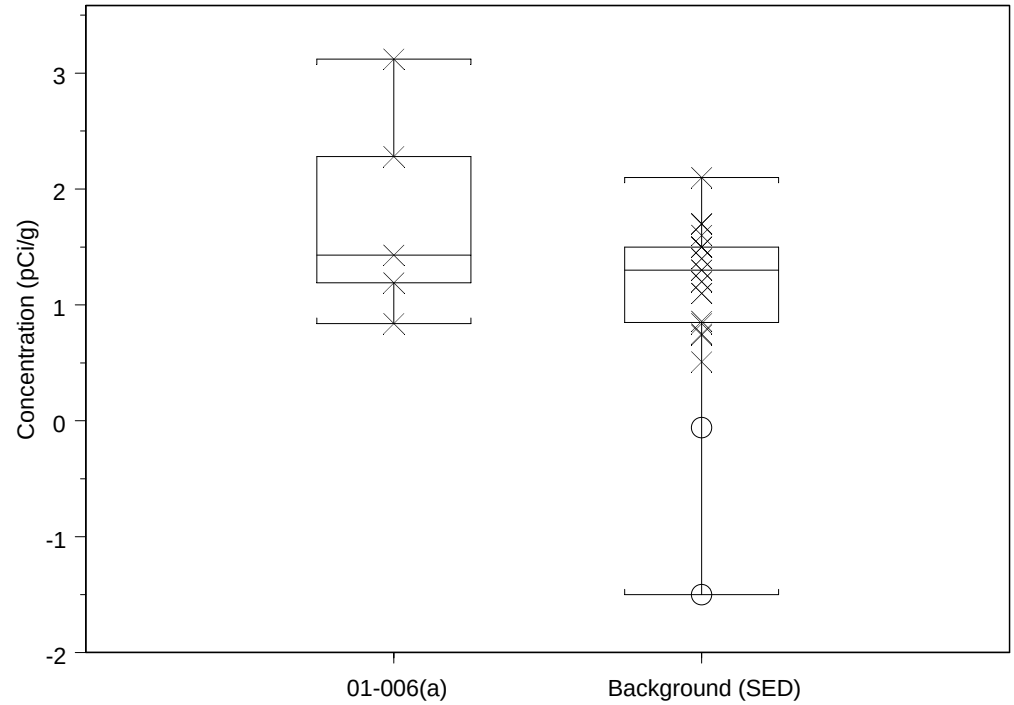


Figure F-3.17-17 Site concentrations of uranium-238 in sediment at SWMU 01-006(a) compared to background

(× = detect, ○ = nondetect)

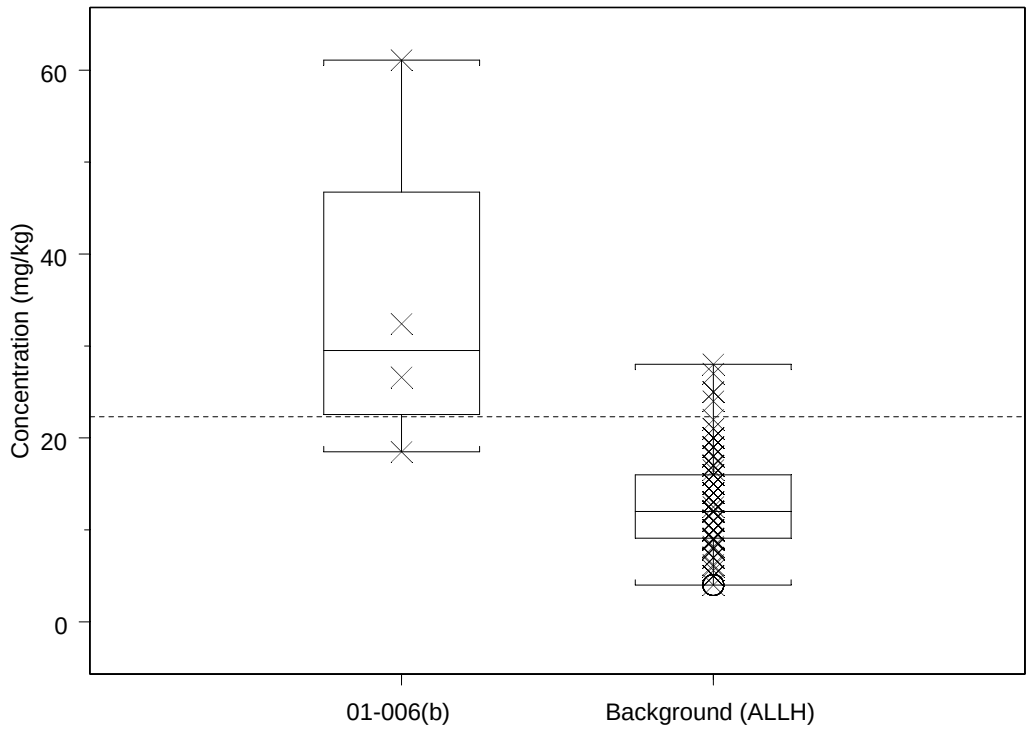


Figure F-3.18-1 Site concentrations of lead in soil at SWMU 01-006(b) compared to background

(× = detect, ○ = nondetect)

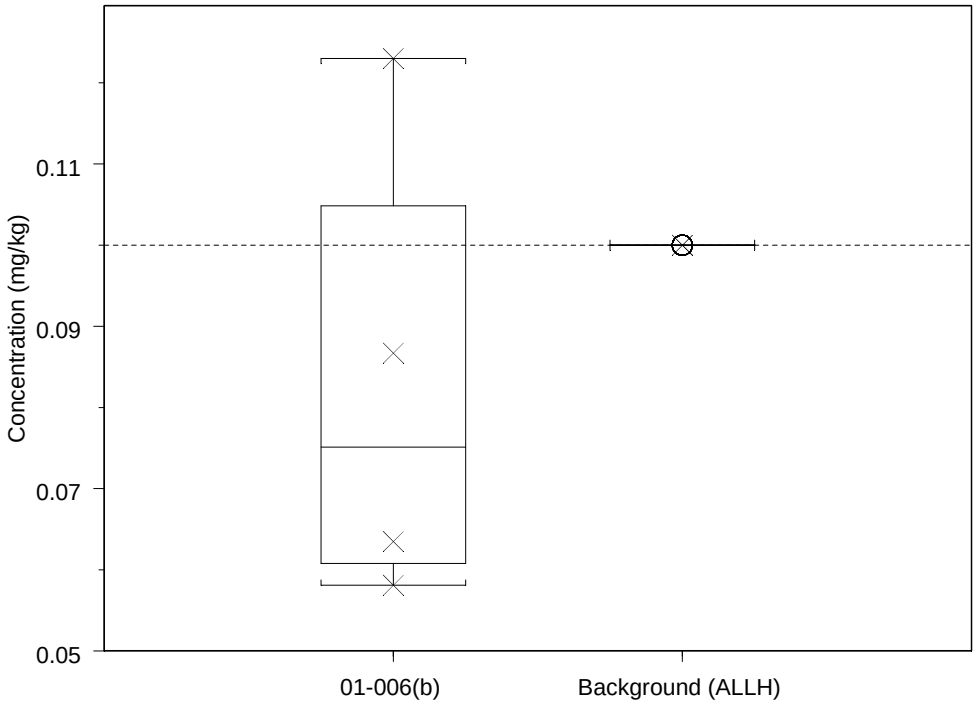


Figure F-3.18-2 Site concentrations of mercury in soil at SWMU 01-006(b) compared to background

(× = detect, ○ = nondetect)

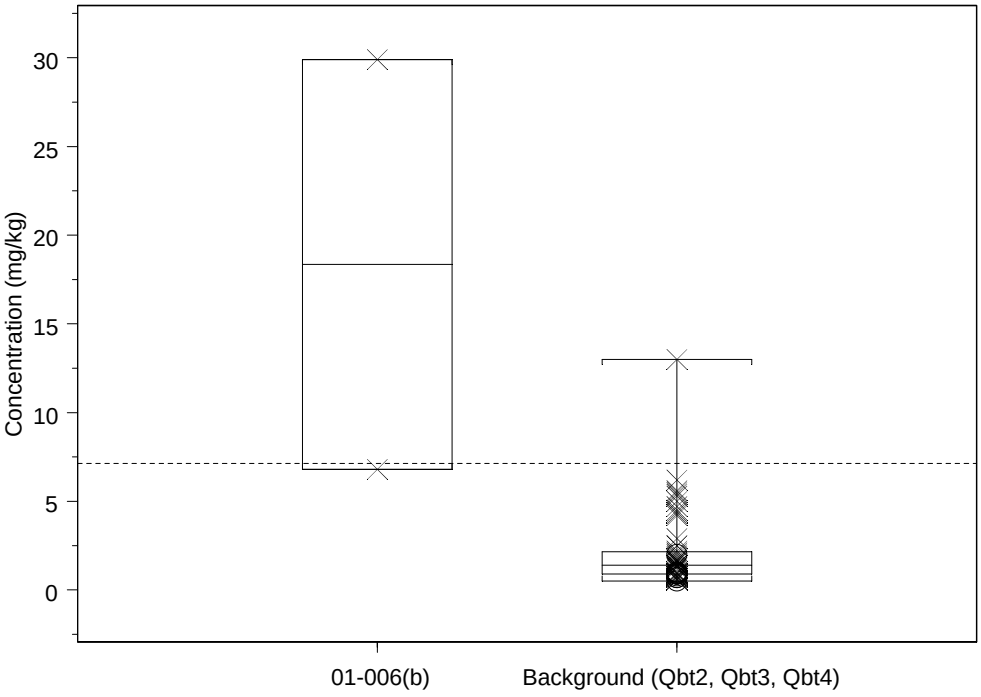


Figure F-3.18-3 Site concentrations of chromium in tuff at SWMU 01-006(b) compared to background

(× = detect, ○ = nondetect)

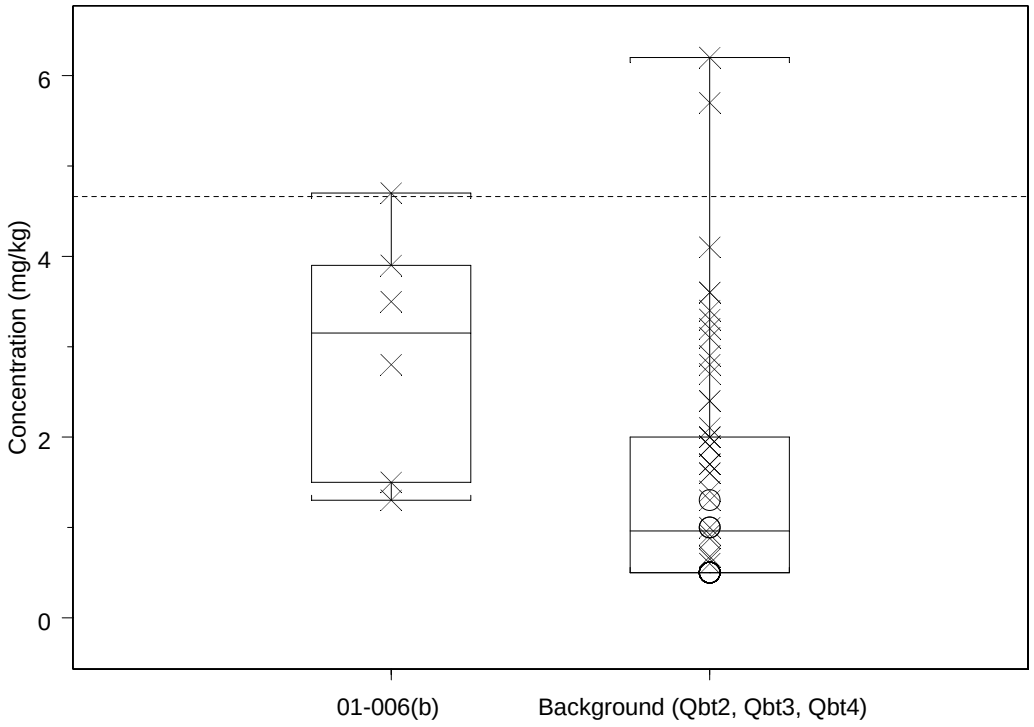


Figure F-3.18-4 Site concentrations of copper in tuff at SWMU 01-006(b) compared to background
(× = detect, ○ = nondetect)

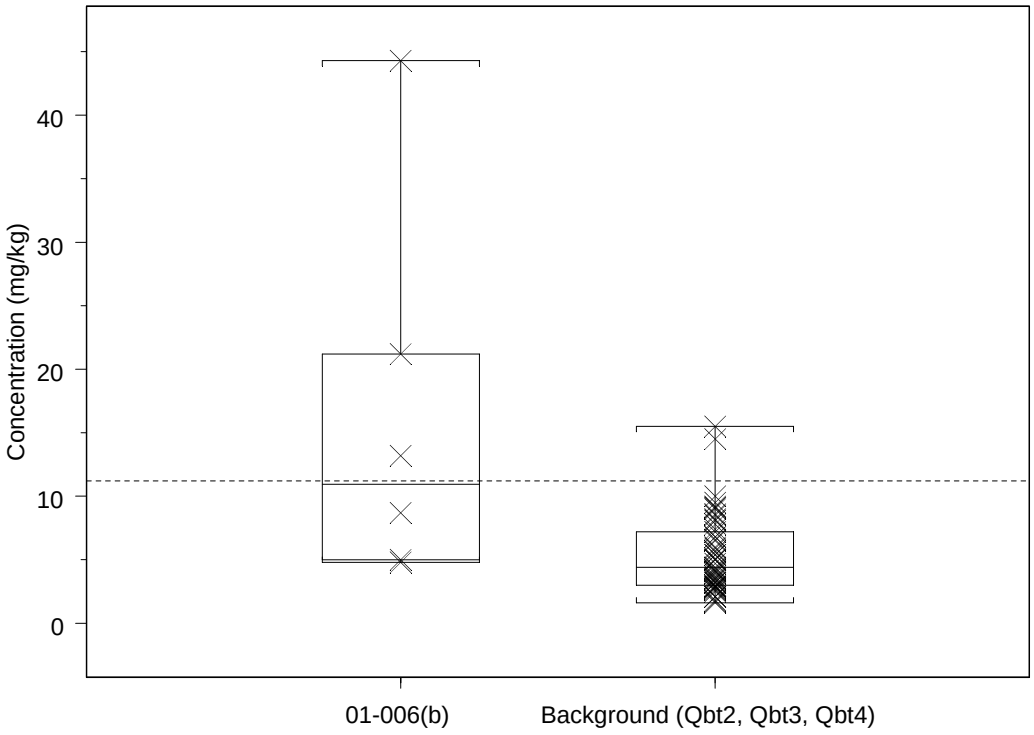


Figure F-3.18-5 Site concentrations of lead in tuff at SWMU 01-006(b) compared to background
(× = detect, ○ = nondetect)

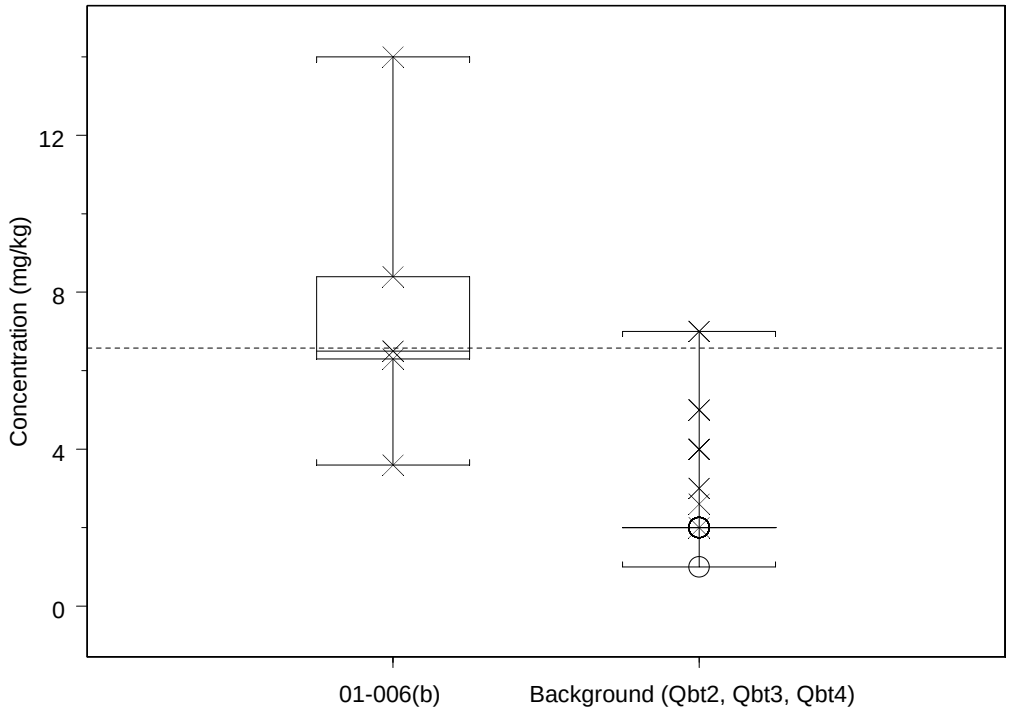


Figure F-3.18-6 Site concentrations of nickel in tuff at SWMU 01-006(b) compared to background
(× = detect, ○ = nondetect)

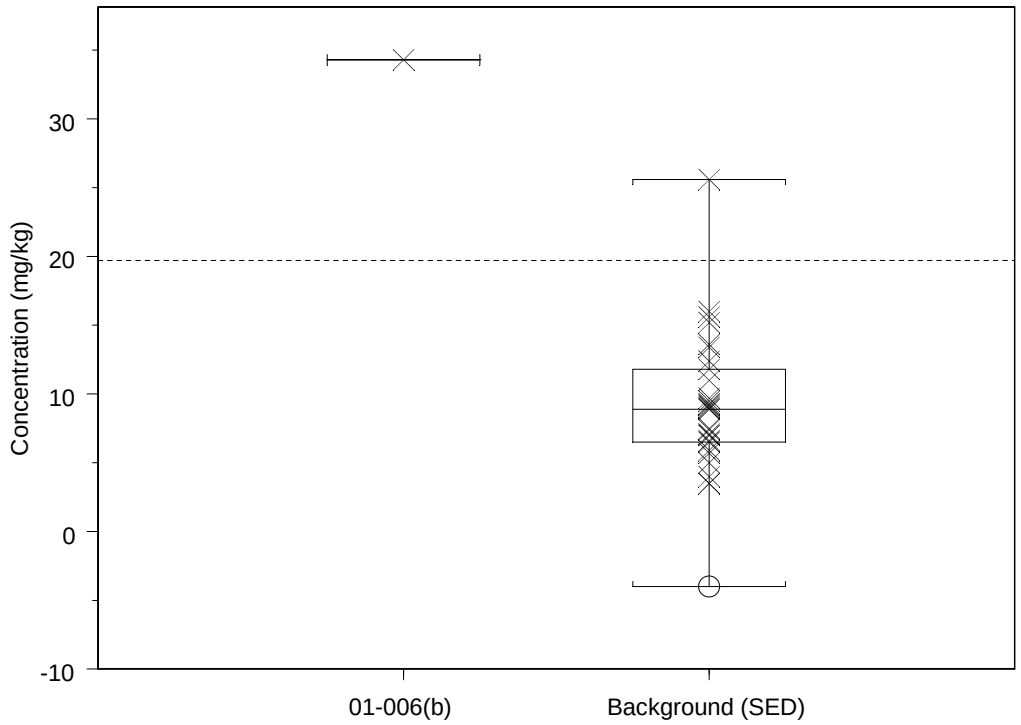


Figure F-3.18-7 Site concentrations of lead in sediment at SWMU 01-006(b) compared to background
(× = detect, ○ = nondetect)

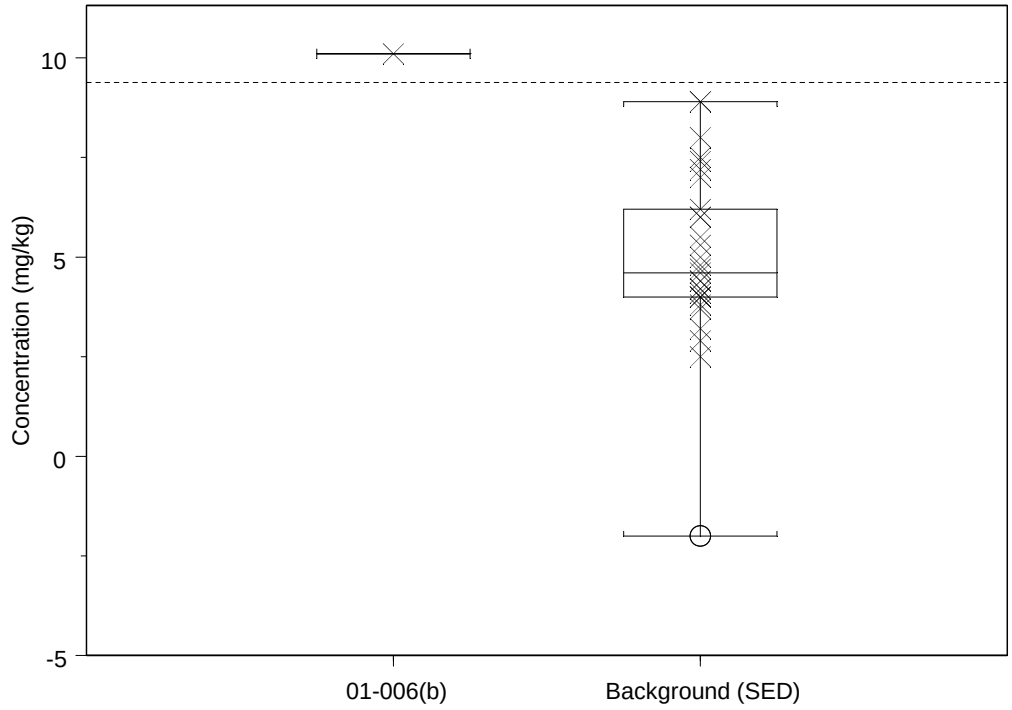


Figure F-3.18-8 Site concentrations of nickel in sediment at SWMU 01-006(b) compared to background

(× = detect, ○ = nondetect)

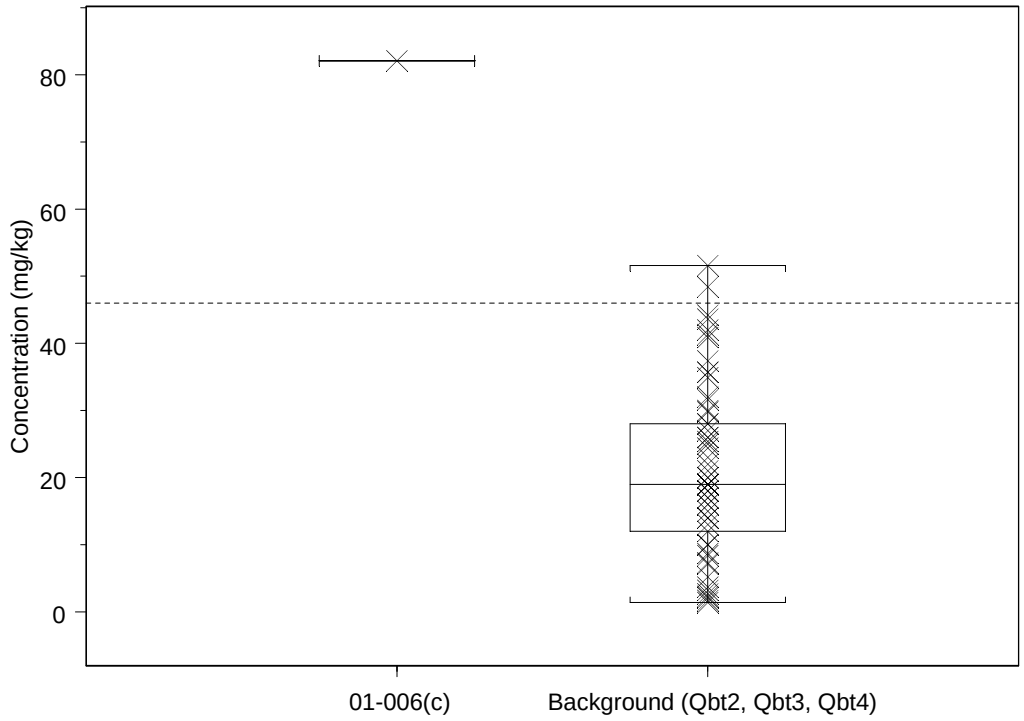


Figure F-3.19-1 Site concentrations of barium in tuff at SWMU 01-006(c) compared to background

(× = detect, ○ = nondetect)

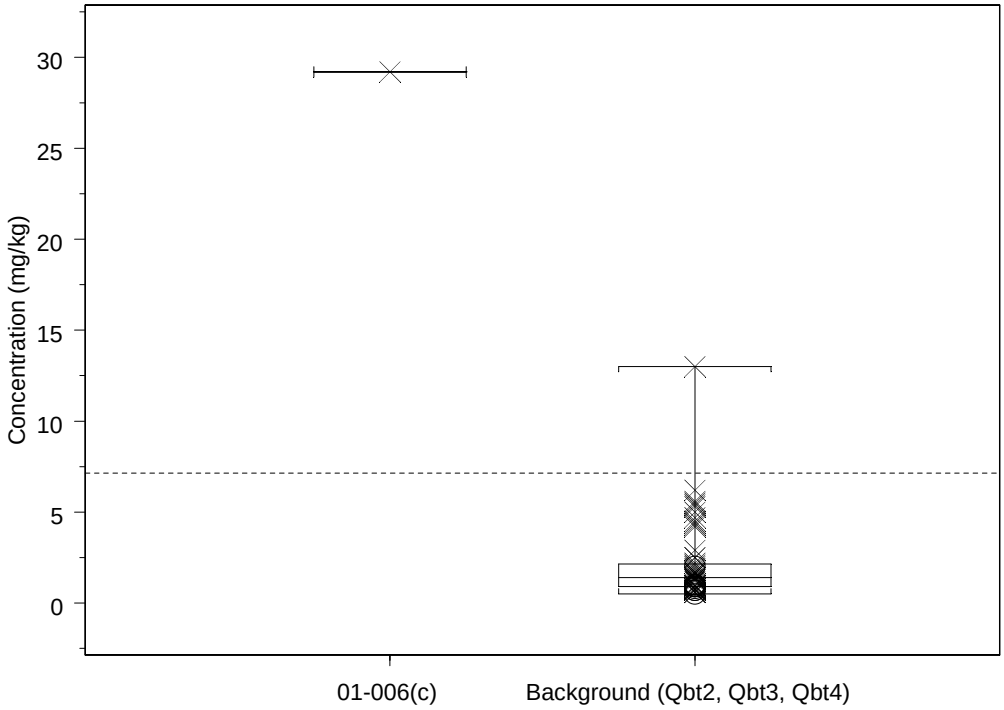


Figure F-3.19-2 Site concentrations of chromium in tuff at SWMU 01-006(c) compared to background

(× = detect, ○ = nondetect)

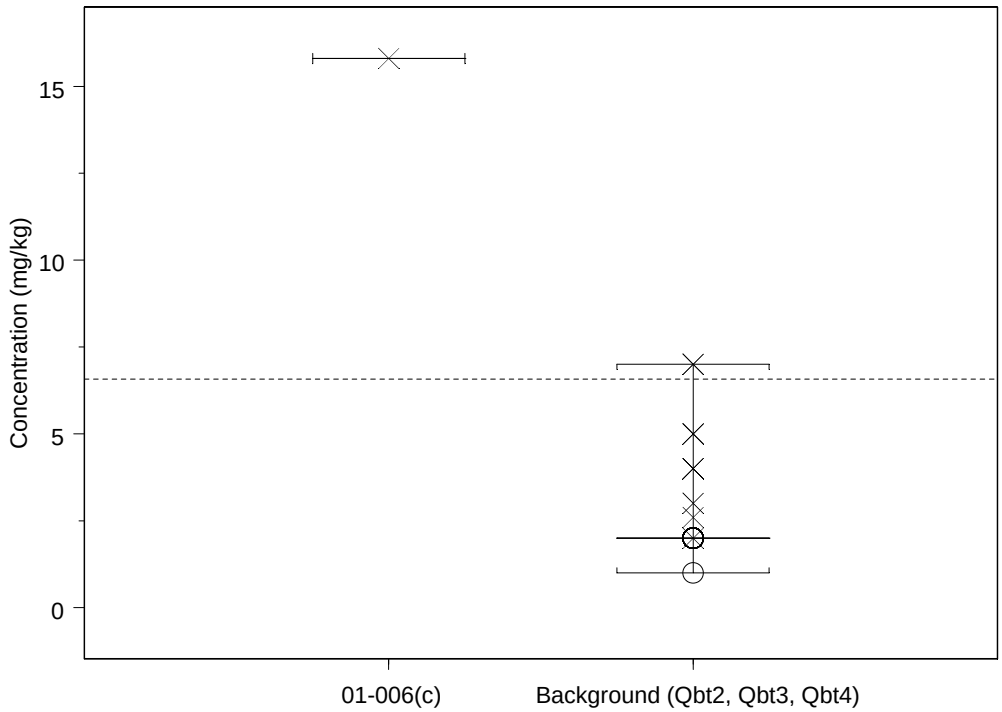


Figure F-3.19-3 Site concentrations of nickel in tuff at SWMU 01-006(c) compared to background

(× = detect, ○ = nondetect)

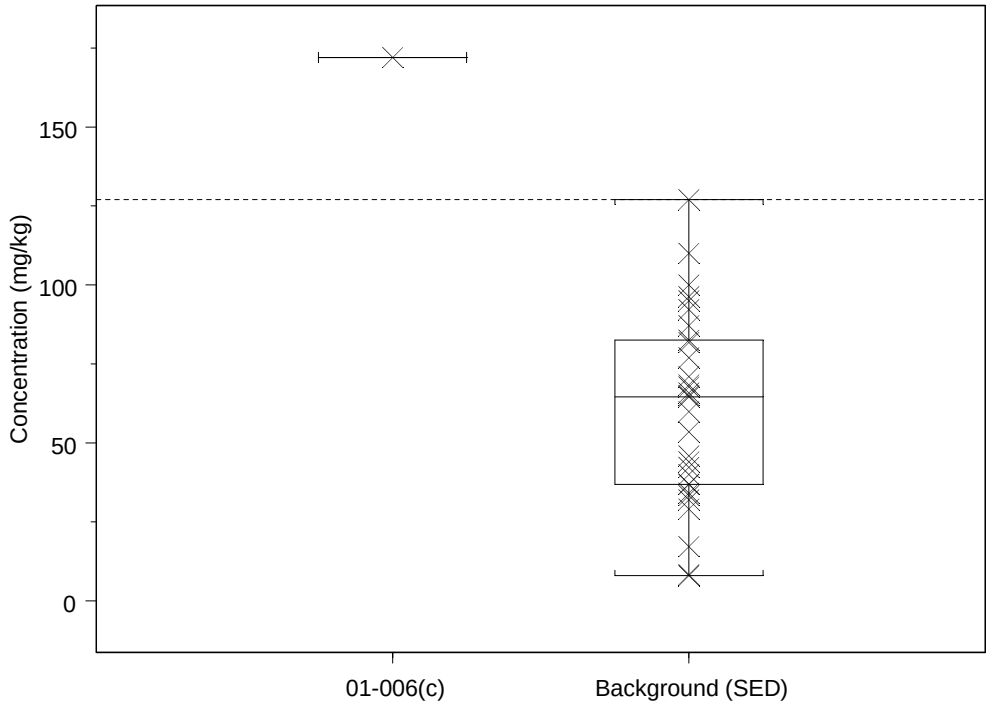


Figure F-3.19-4 Site concentrations of barium in sediment at SWMU 01-006(c) compared to background

(× = detect, ○ = nondetect)

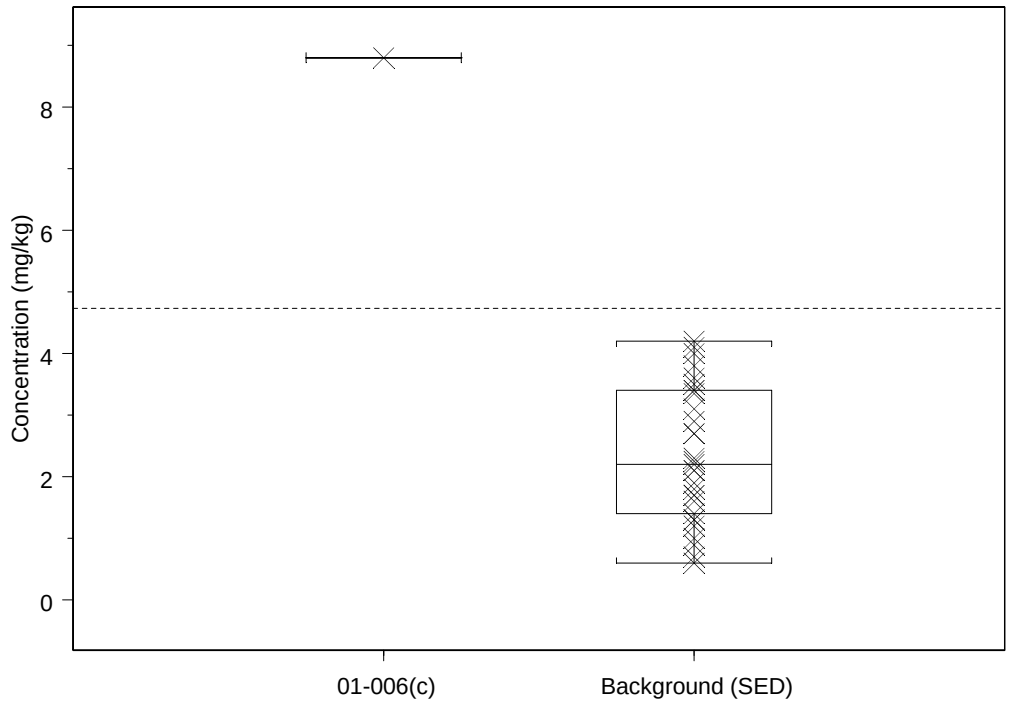


Figure F-3.19-5 Site concentrations of cobalt in sediment at SWMU 01-006(c) compared to background

(× = detect, ○ = nondetect)

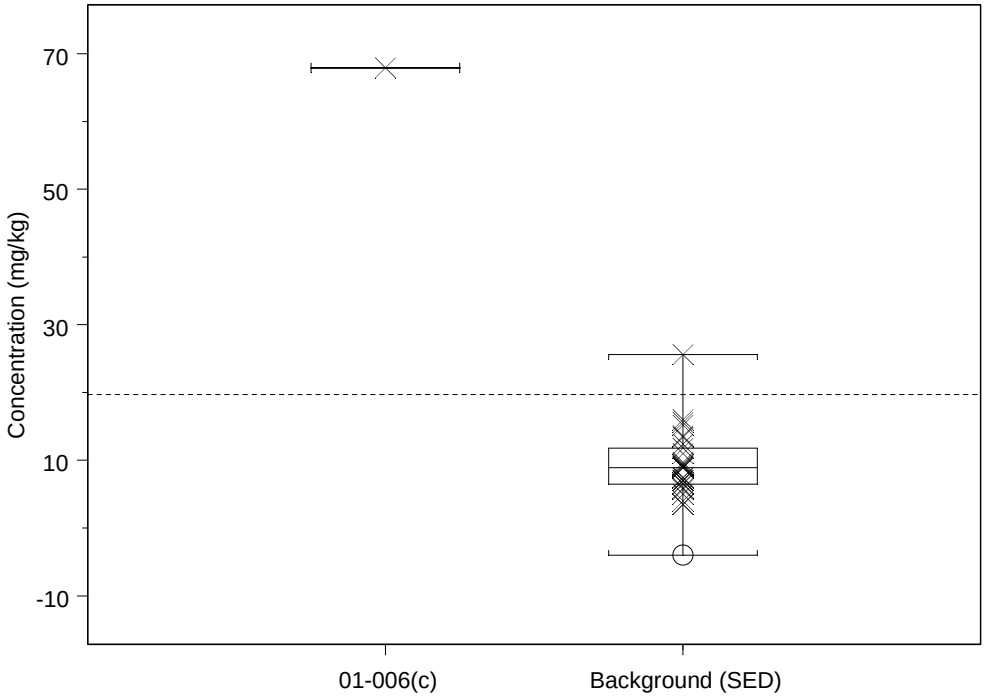


Figure F-3.19-6 Site concentrations of lead in sediment at SWMU 01-006(c) compared to background

(× = detect, ○ = nondetect)

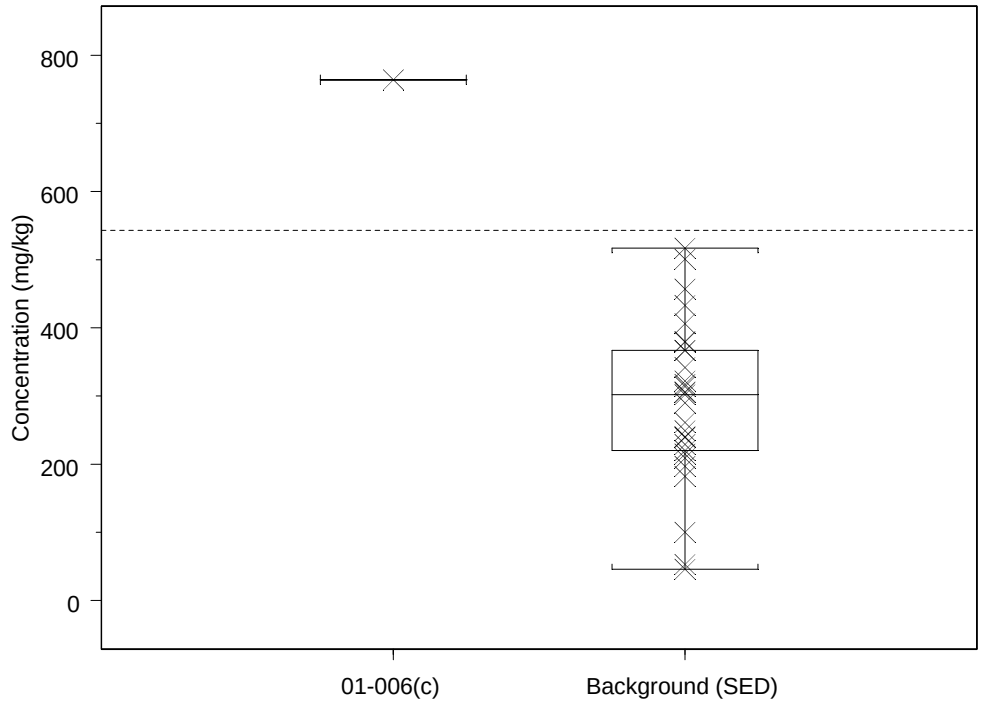


Figure F-3.19-7 Site concentrations of manganese in sediment at SWMU 01-006(c) compared to background

(× = detect, ○ = nondetect)

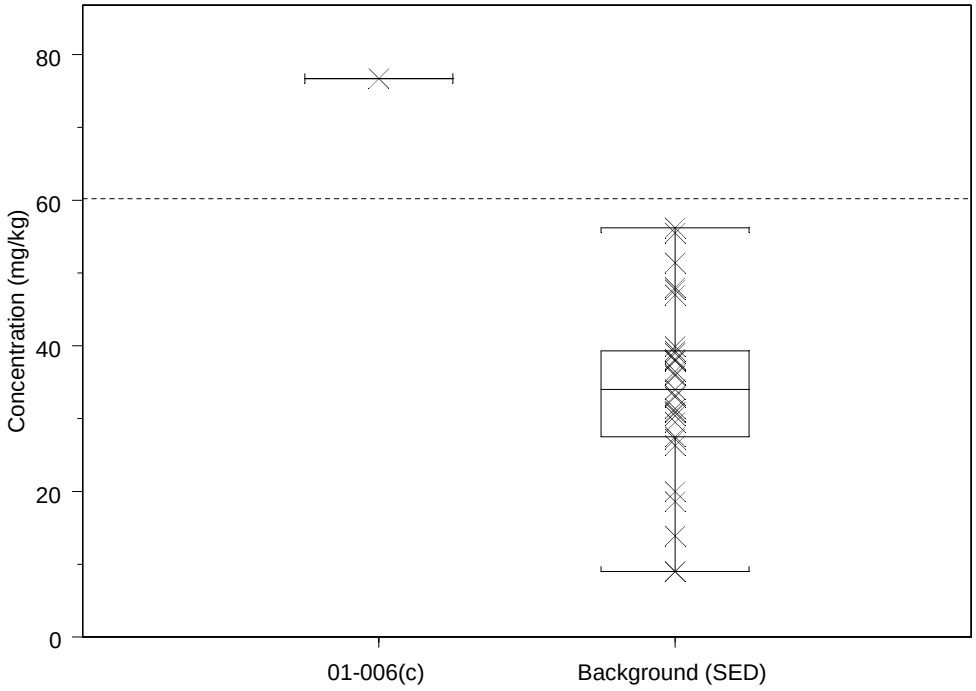


Figure F-3.19-8 Site concentrations of zinc in sediment at SWMU 01-006(c) compared to background

(× = detect, ○ = nondetect)

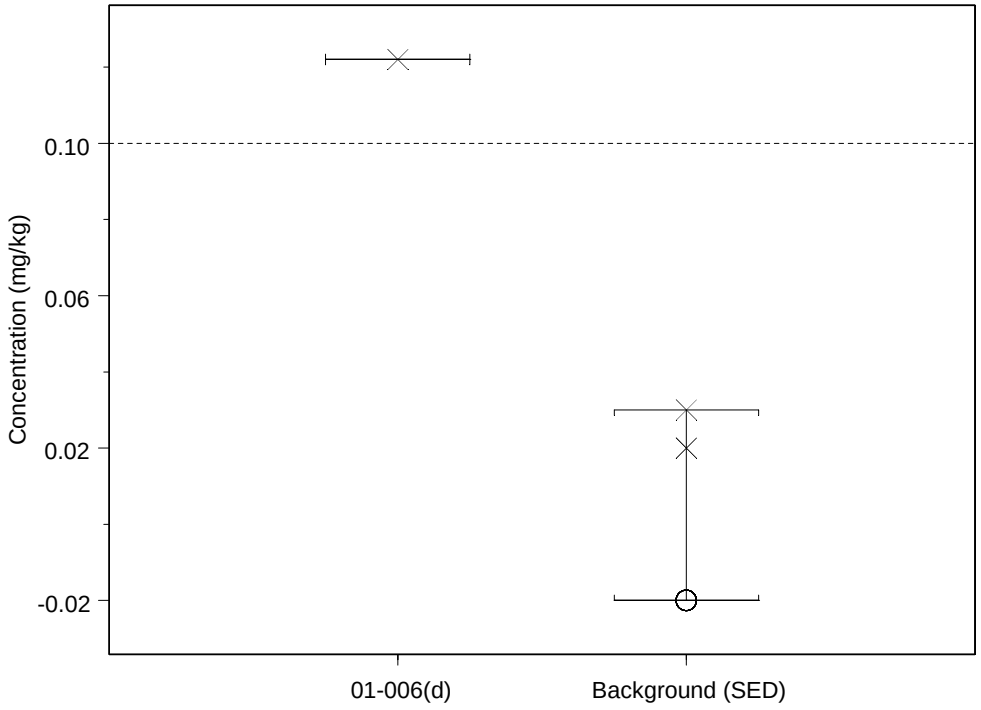


Figure F-3.20-1 Site concentrations of mercury in sediment at SWMU 01-006(d) compared to background

(× = detect, ○ = nondetect)

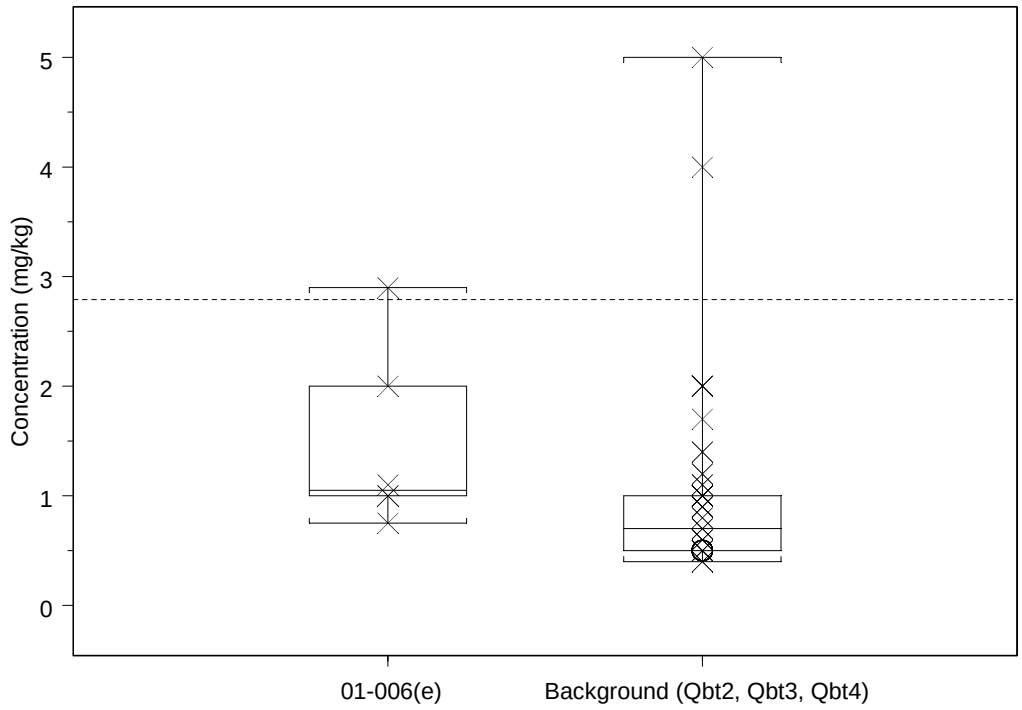


Figure F-3.21-1 Site concentrations of arsenic in tuff at AOC 01-006(e) compared to background
(× = detect, ○ = nondetect)

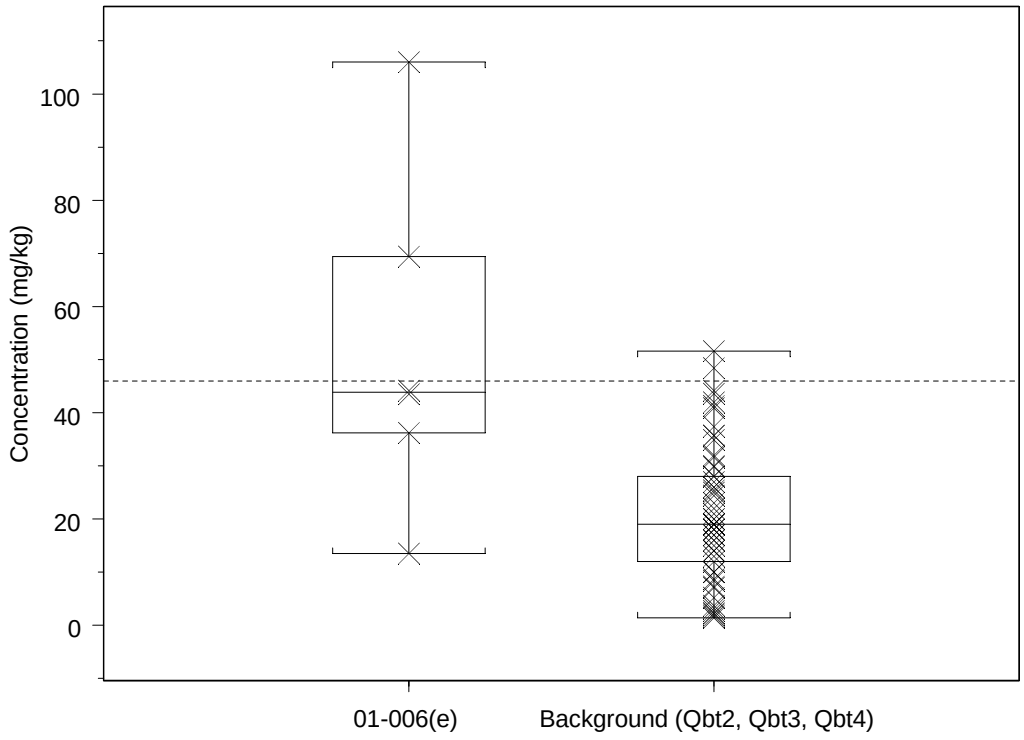


Figure F-3.21-2 Site concentrations of barium in tuff at AOC 01-006(e) compared to background
(× = detect, ○ = nondetect)

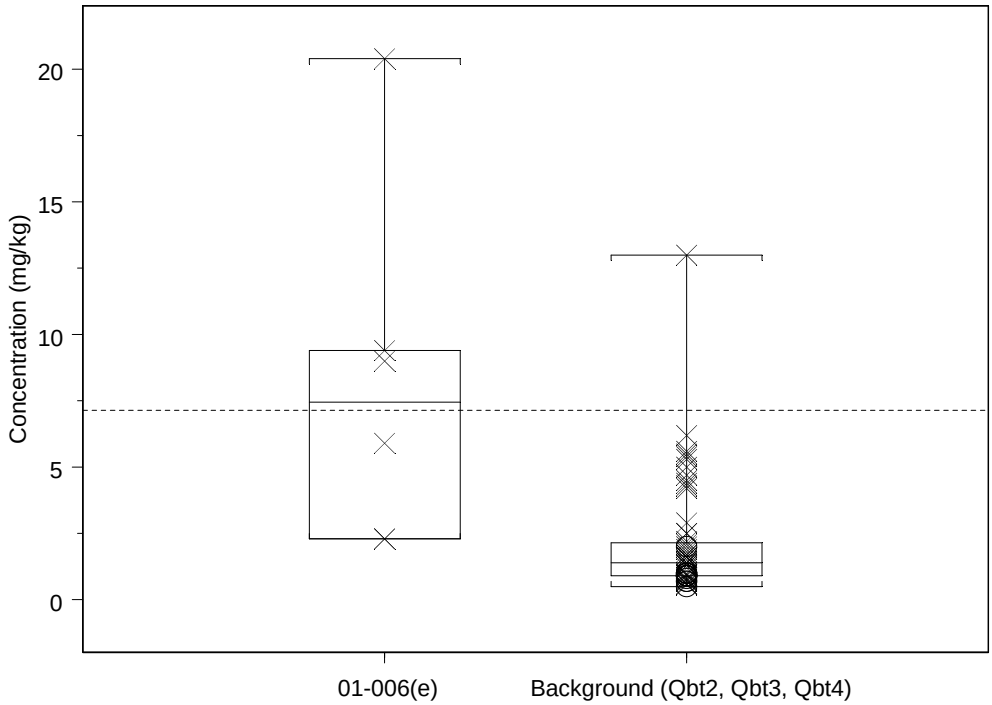


Figure F-3.21-3 Site concentrations of chromium in tuff at AOC 01-006(e) compared to background

(× = detect, ○ = nondetect)

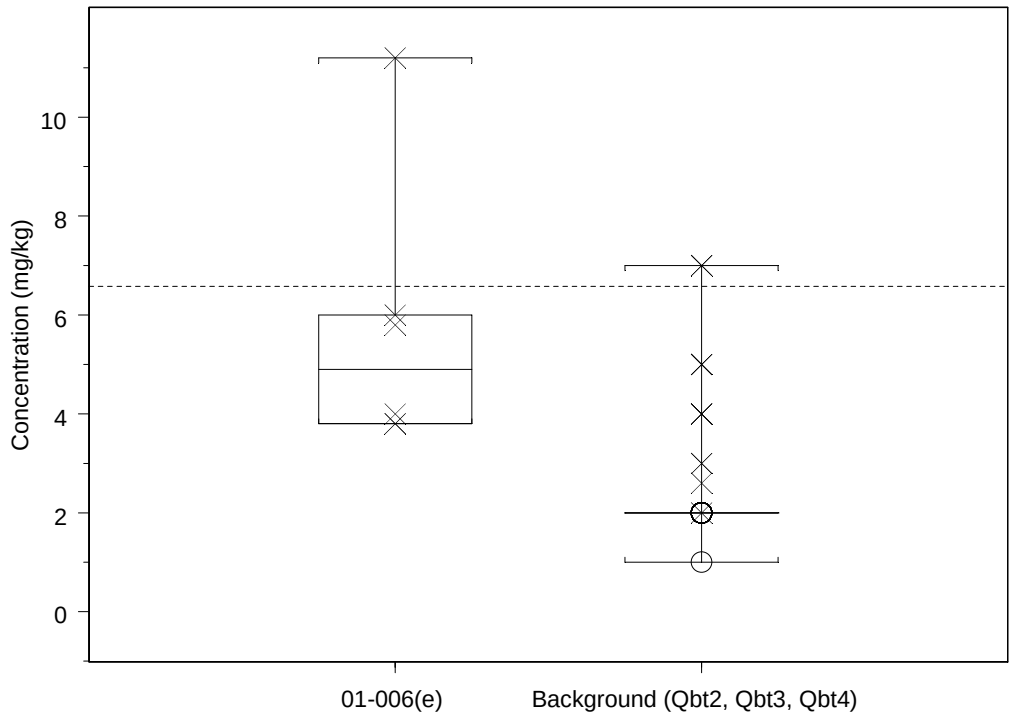


Figure F-3.21-4 Site concentrations of nickel in tuff at AOC 01-006(e) compared to background

(× = detect, ○ = nondetect)

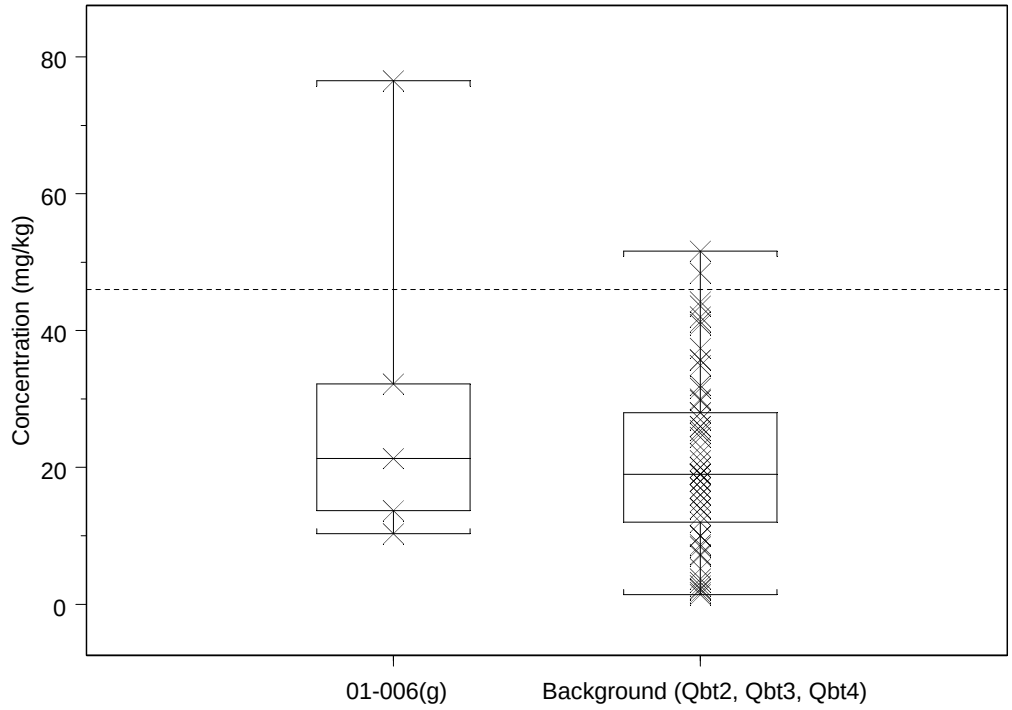


Figure F-3.22-1 Site concentrations of barium in tuff at AOC 01-006(g) compared to background
(× = detect, ○ = nondetect)

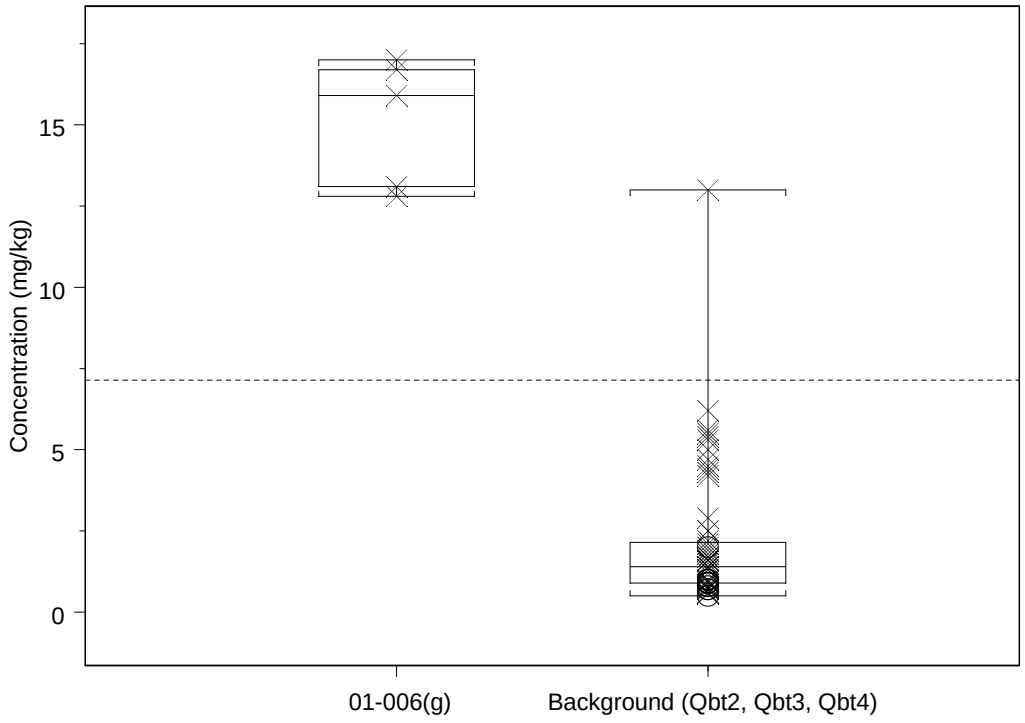


Figure F-3.22-2 Site concentrations of chromium in tuff at AOC 01-006(g) compared to background
(× = detect, ○ = nondetect)

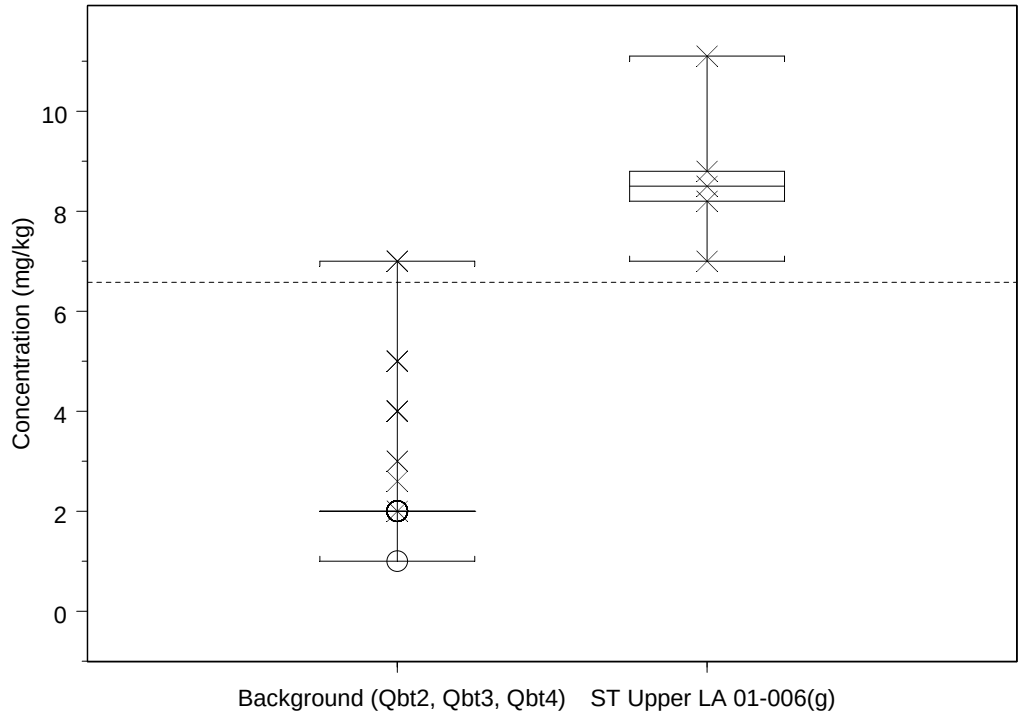


Figure F-3.22-3 Site concentrations of nickel in tuff at AOC 01-006(g) compared to background
(× = detect, ○ = nondetect)

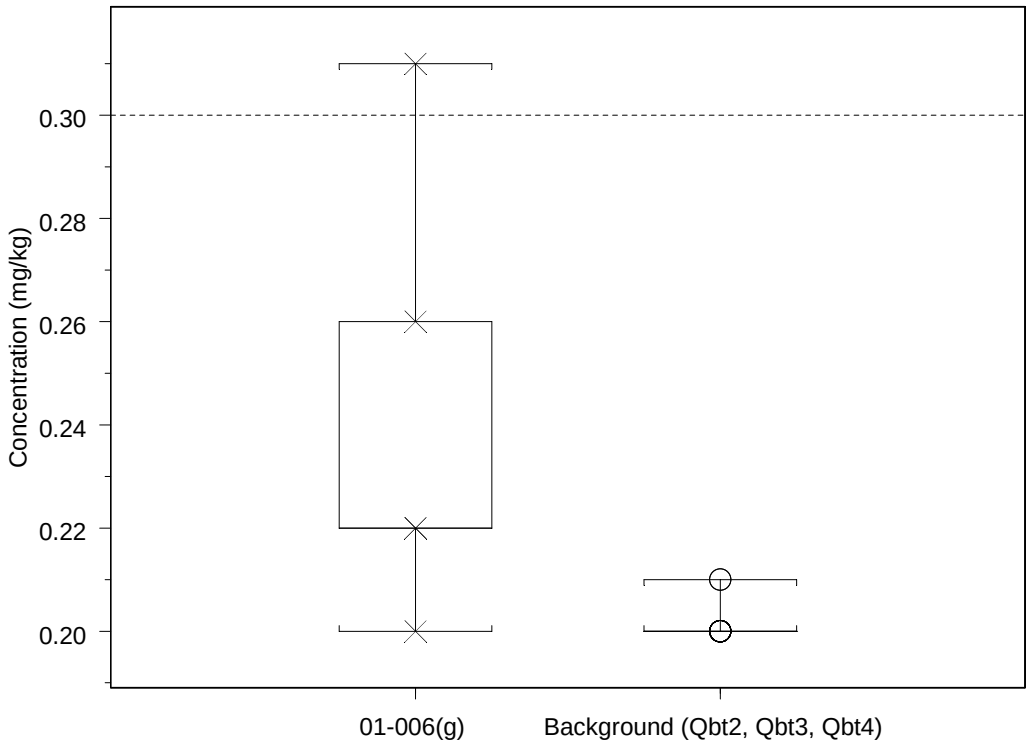


Figure F-3.22-4 Site concentrations of selenium in tuff at AOC 01-006(g) compared to background
(× = detect, ○ = nondetect)

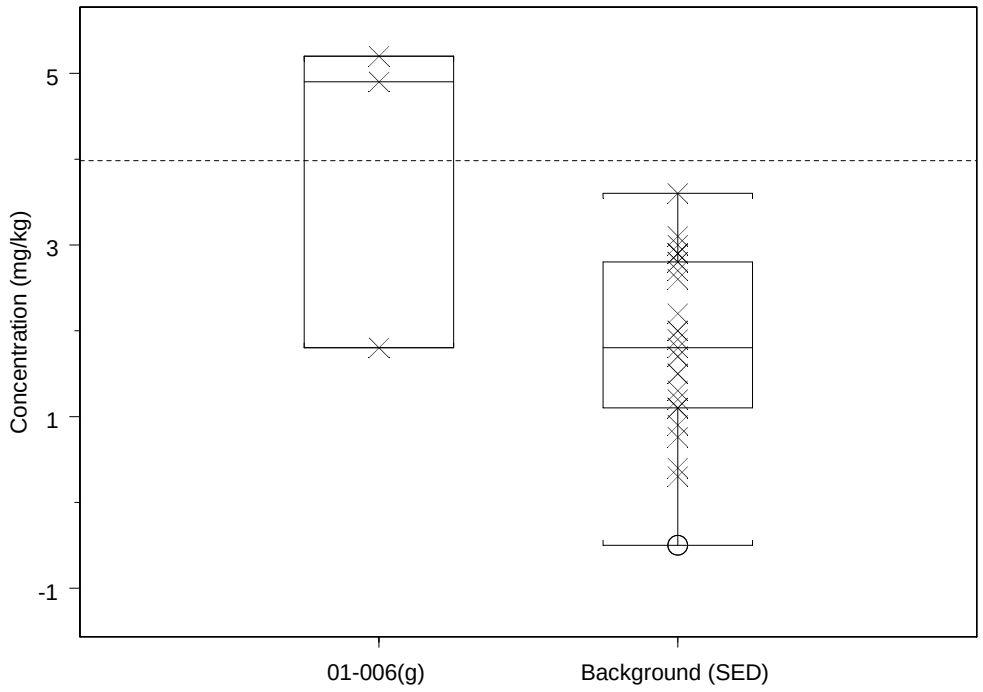


Figure F-3.22-5 Site concentrations of arsenic in sediment at AOC 01-006(g) compared to background

(× = detect, ○ = nondetect)

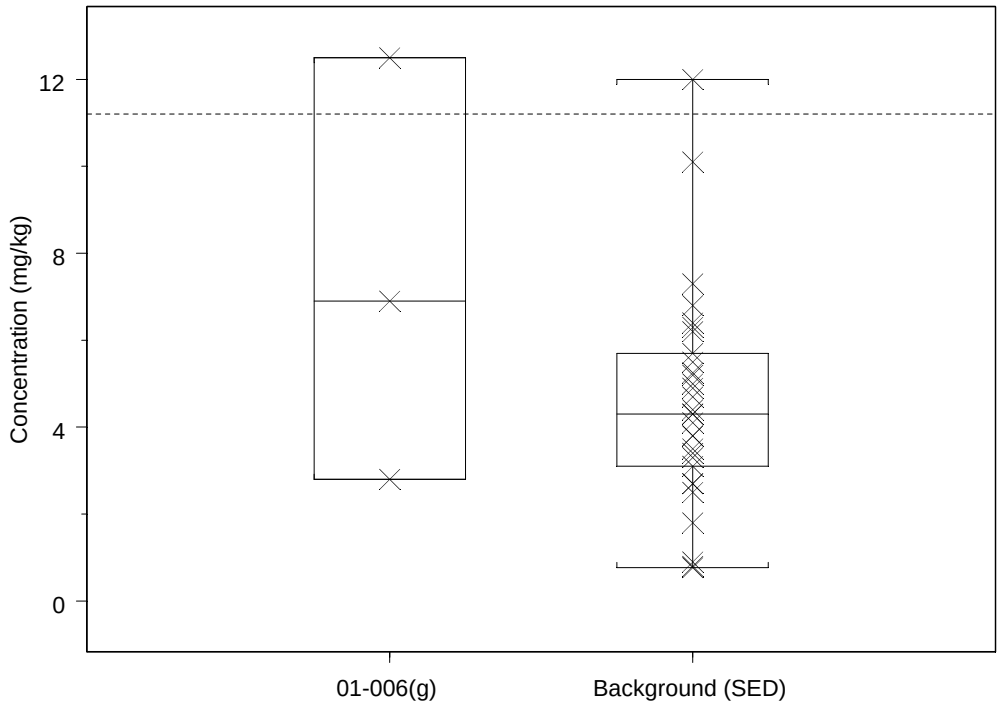


Figure F-3.22-6 Site concentrations of copper in sediment at AOC 01-006(g) compared to background

(× = detect, ○ = nondetect)

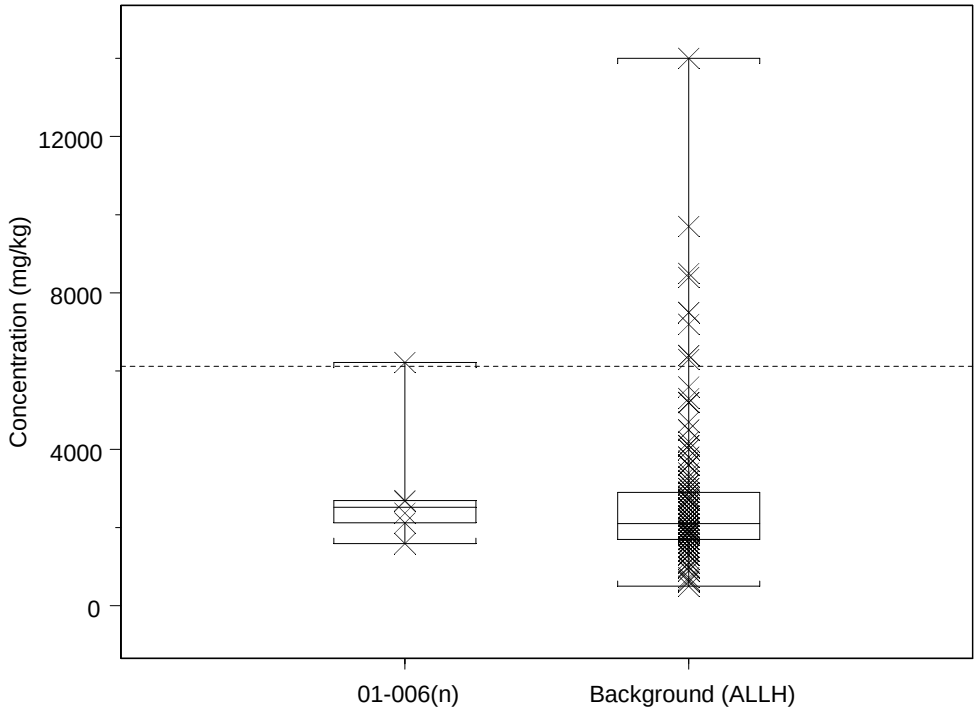


Figure F-3.24-1 Site concentrations of calcium in soil at SWMU 01-006(n) compared to background

(× = detect, ○ = nondetect)

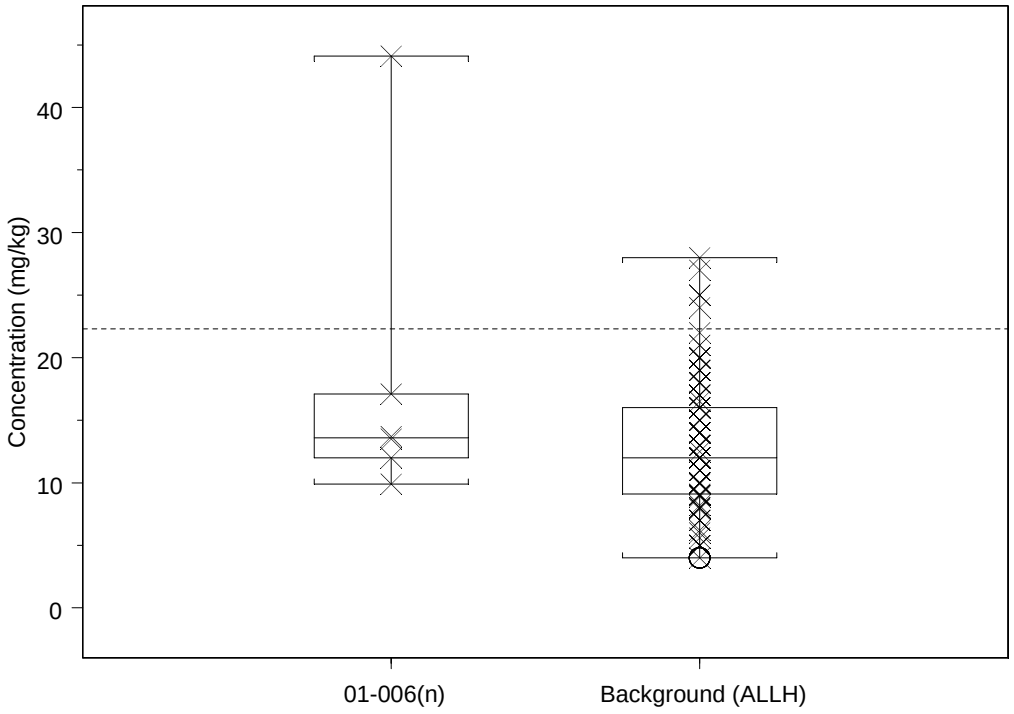


Figure F-3.24-2 Site concentrations of lead in soil at SWMU 01-006(n) compared to background

(× = detect, ○ = nondetect)

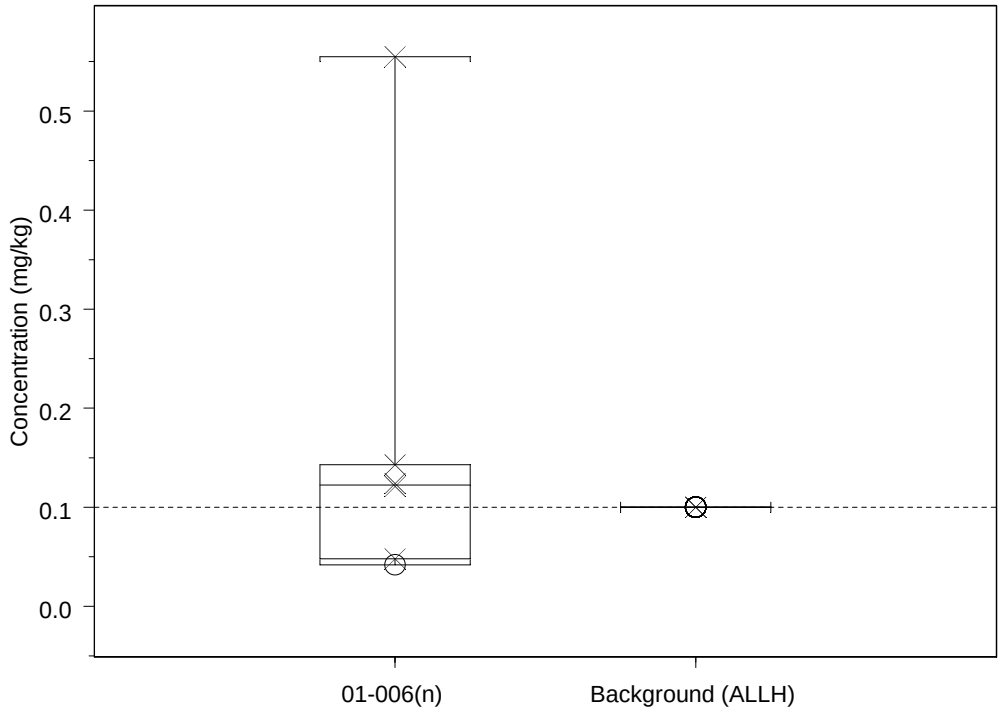


Figure F-3.24-3 Site concentrations of mercury in soil at SWMU 01-006(n) compared to background

(× = detect, ○ = nondetect)

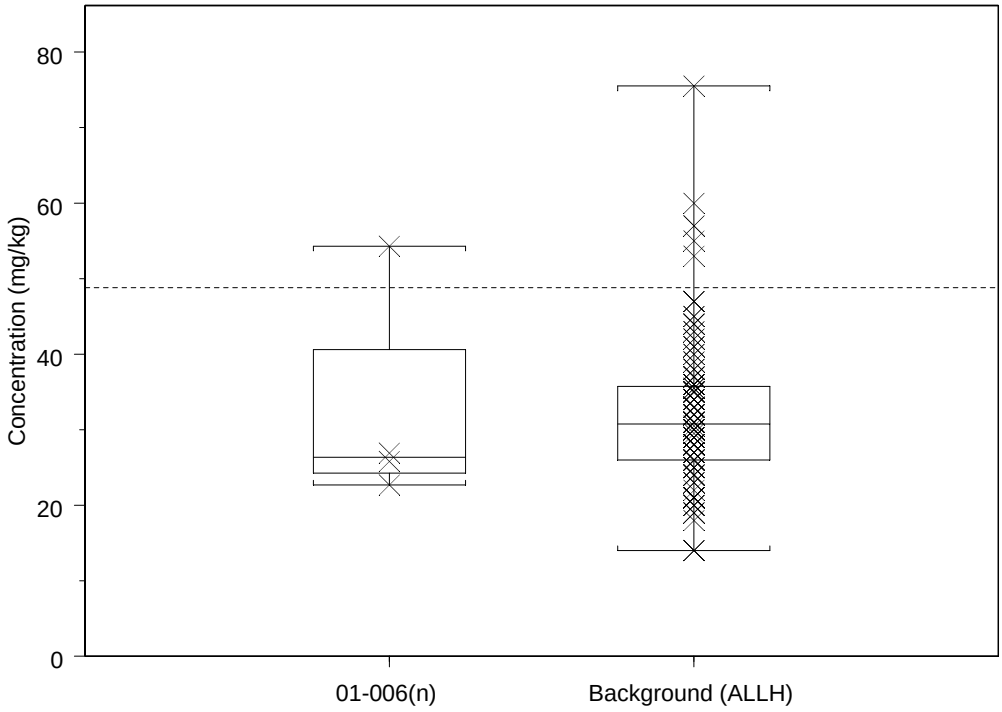


Figure F-3.24-4 Site concentrations of zinc in soil at SWMU 01-006(n) compared to background

(× = detect, ○ = nondetect)

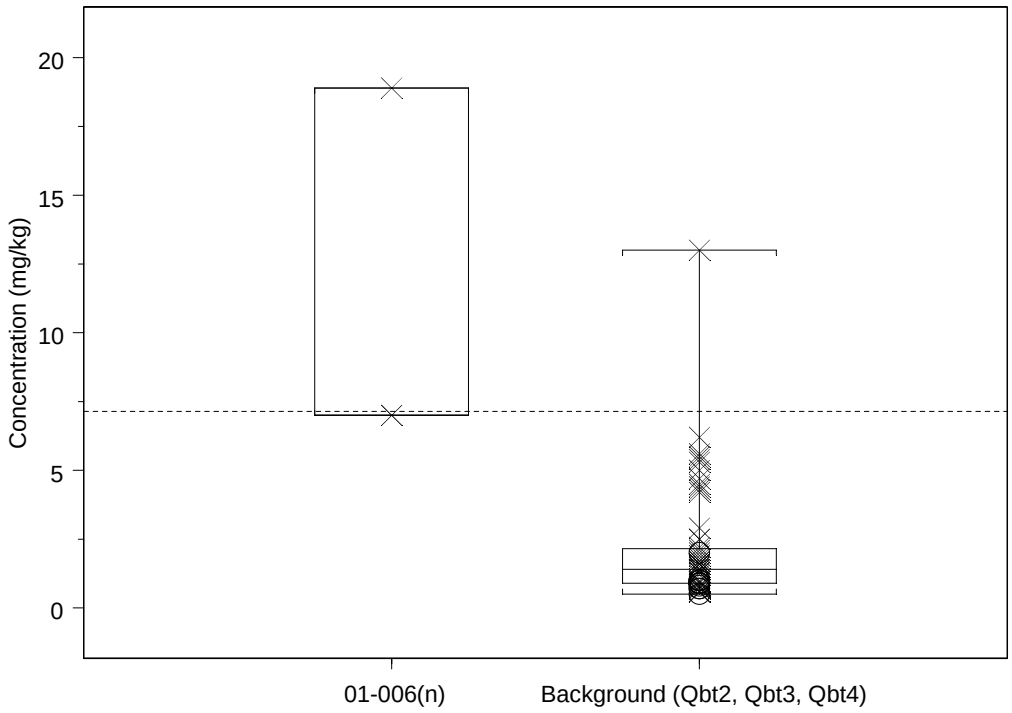


Figure F-3.24-5 Site concentrations of chromium in tuff at SWMU 01-006(n) compared to background

(× = detect, ○ = nondetect)

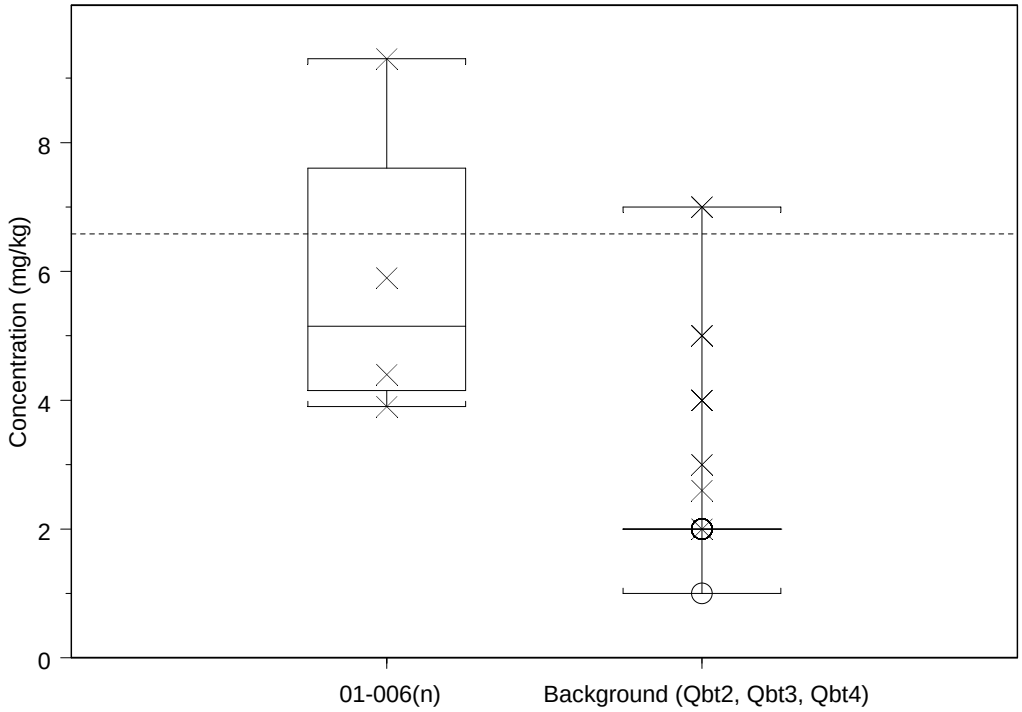


Figure F-3.24-6 Site concentrations of nickel in tuff at SWMU 01-006(n) compared to background

(× = detect, ○ = nondetect)

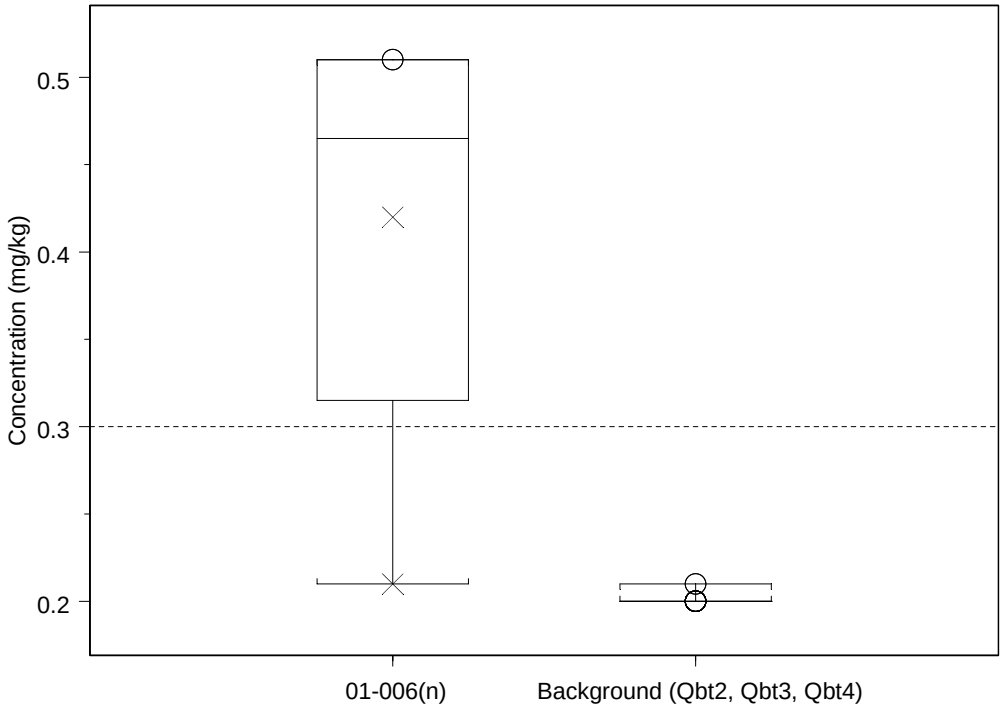


Figure F-3.24-7 Site concentrations of selenium in tuff at SWMU 01-006(n) compared to background

(× = detect, ○ = nondetect)

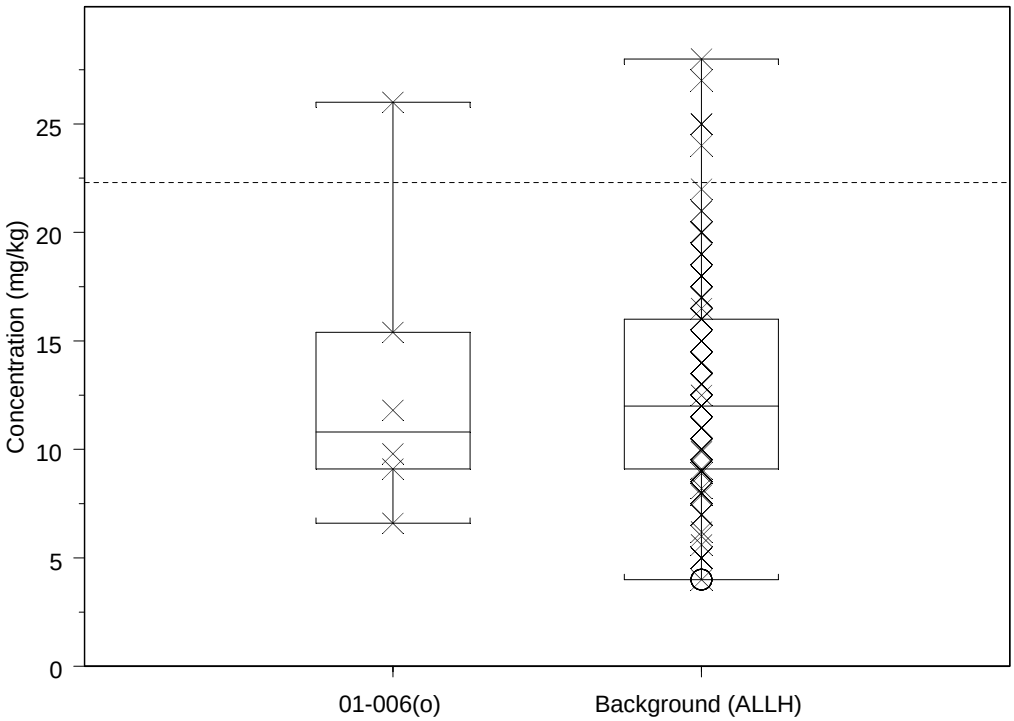


Figure F-3.25-1 Site concentrations of lead in soil at SWMU 01-006(o) compared to background

(× = detect, ○ = nondetect)

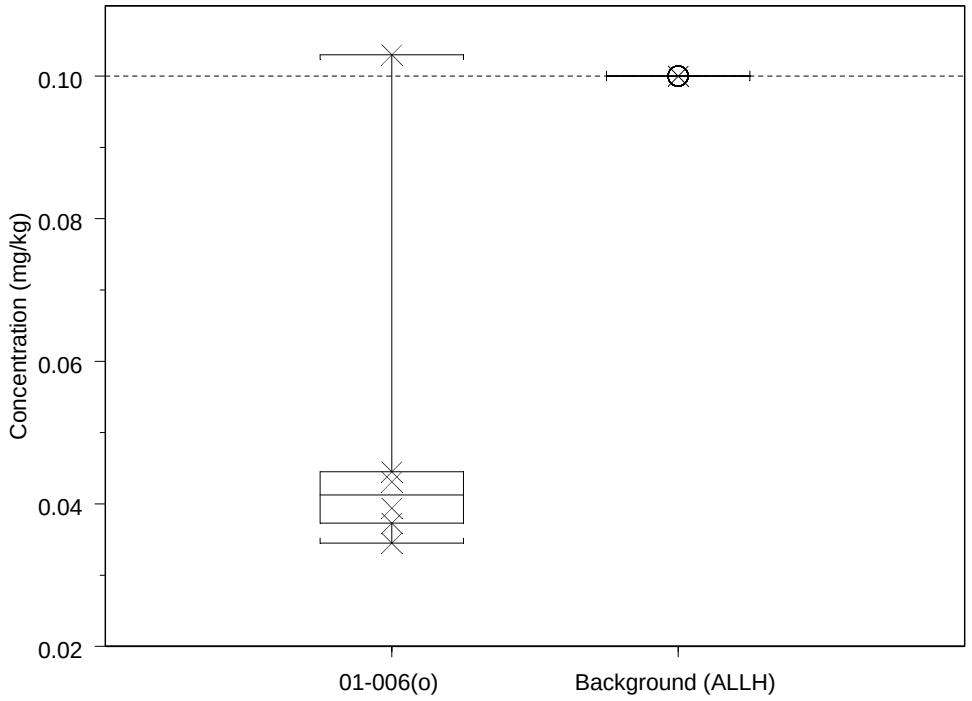


Figure F-3.25-2 Site concentrations of mercury in soil at SWMU 01-006(o) compared to background

(× = detect, ○ = nondetect)

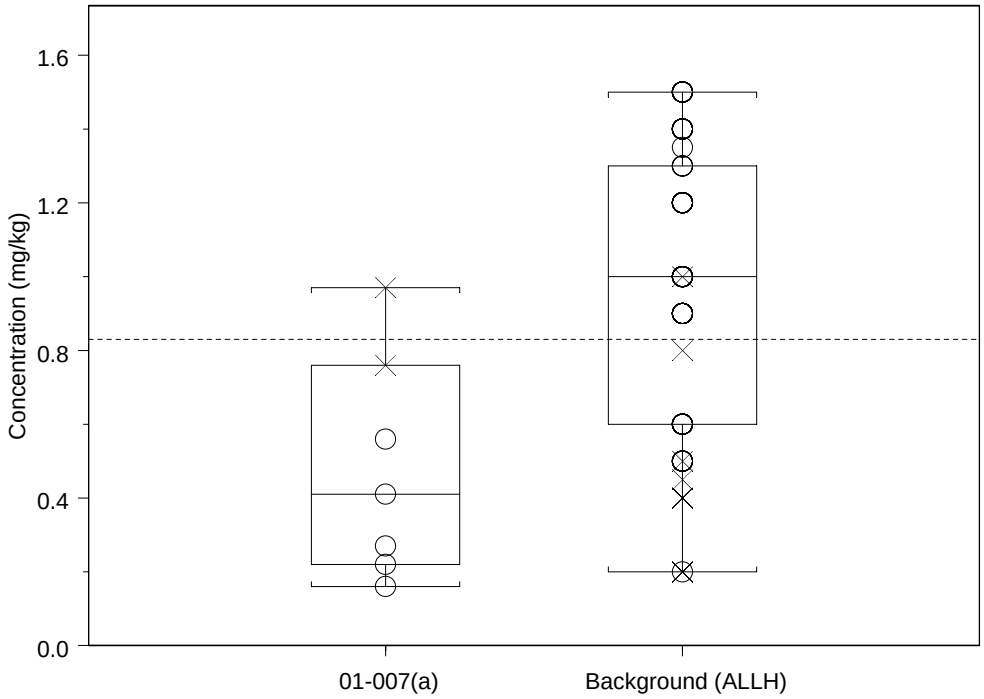


Figure F-3.26-1 Site concentrations of antimony in soil at SWMU 01-007(a) compared to background

(× = detect, ○ = nondetect)

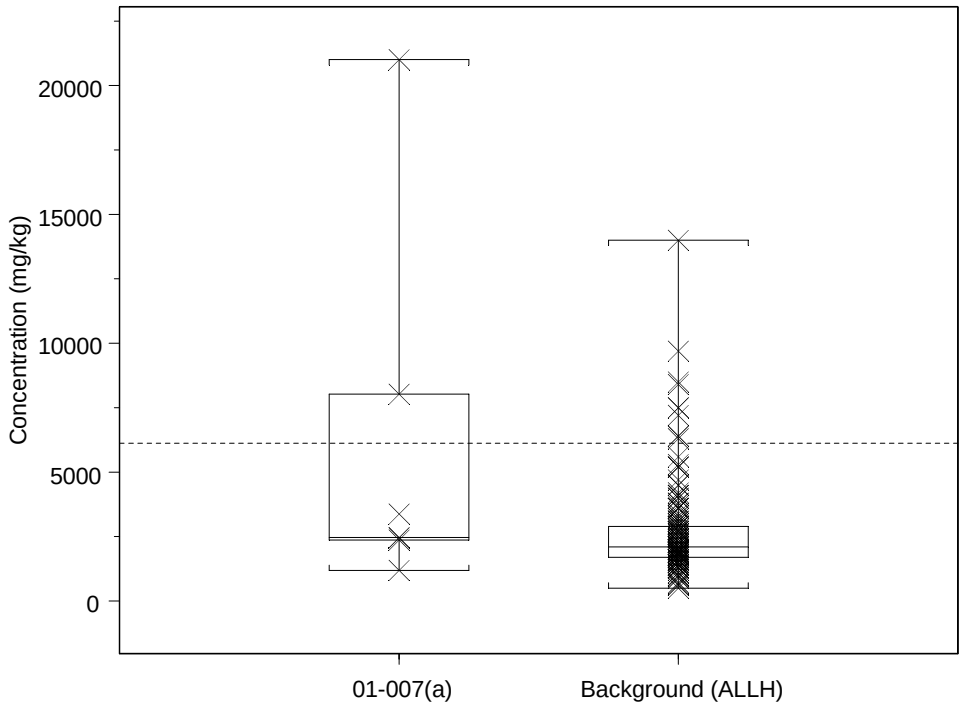


Figure F-3.26-2 Site concentrations of calcium in soil at SWMU 01-007(a) compared to background

(× = detect, ○ = nondetect)

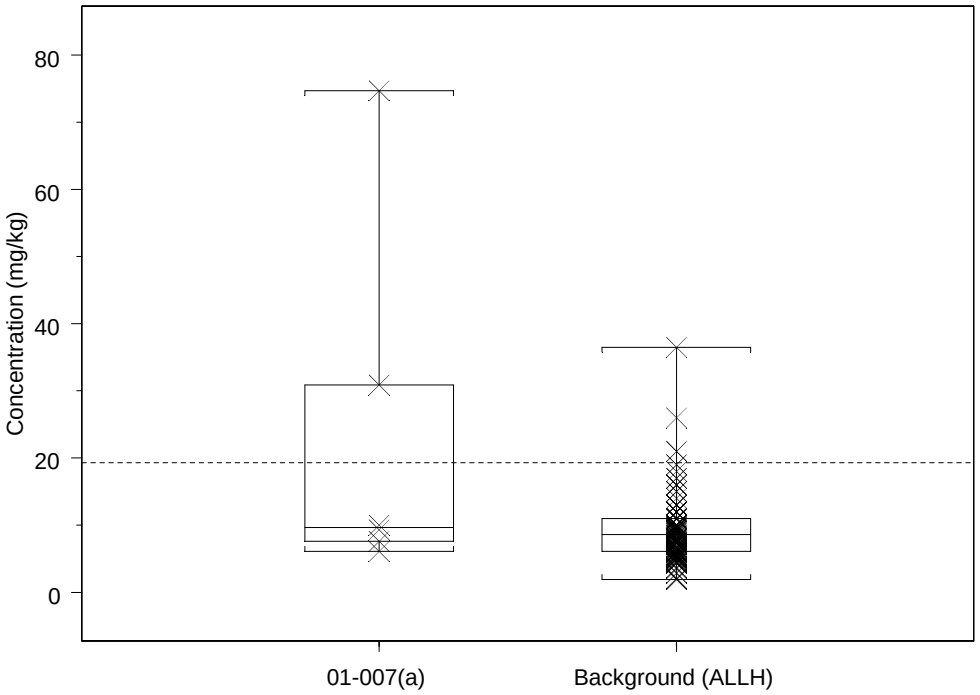


Figure F-3.26-3 Site concentrations of chromium in soil at SWMU 01-007(a) compared to background

(× = detect, ○ = nondetect)

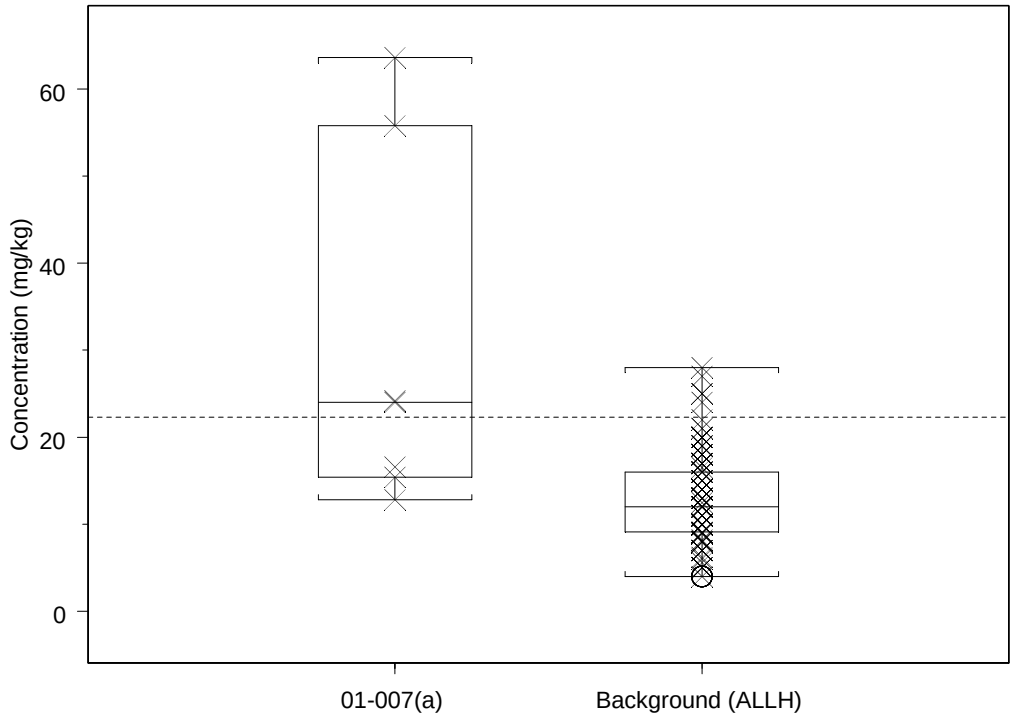


Figure F-3.26-4 Site concentrations of lead in soil at SWMU 01-007(a) compared to background
(× = detect, ○ = nondetect)

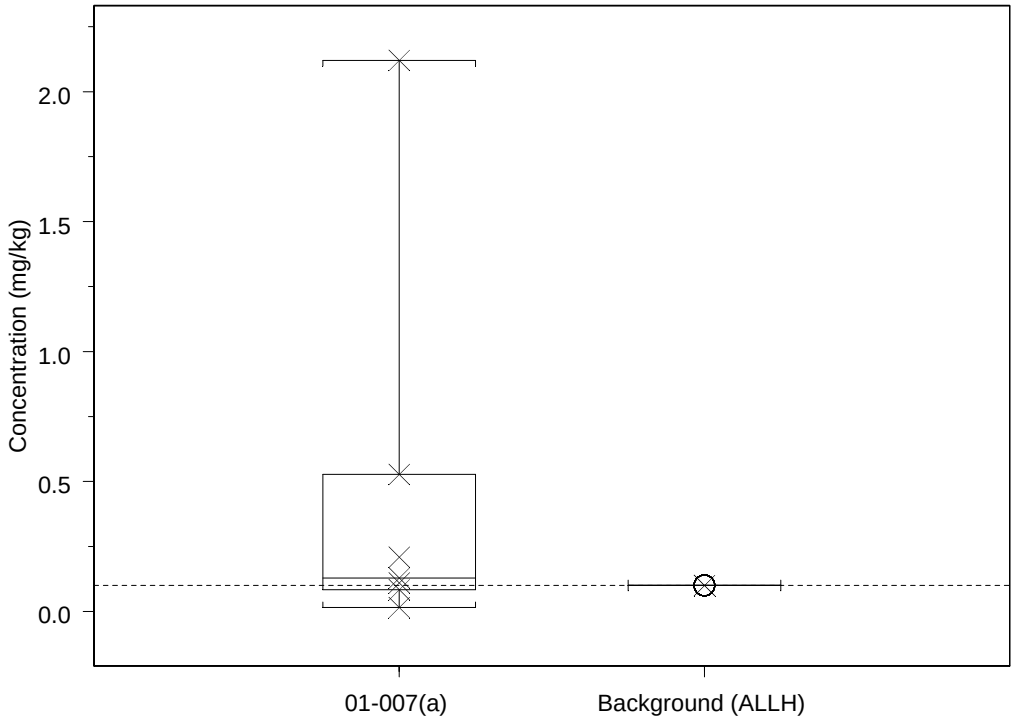


Figure F-3.26-5 Site concentrations of mercury in soil at SWMU 01-007(a) compared to background
(× = detect, ○ = nondetect)

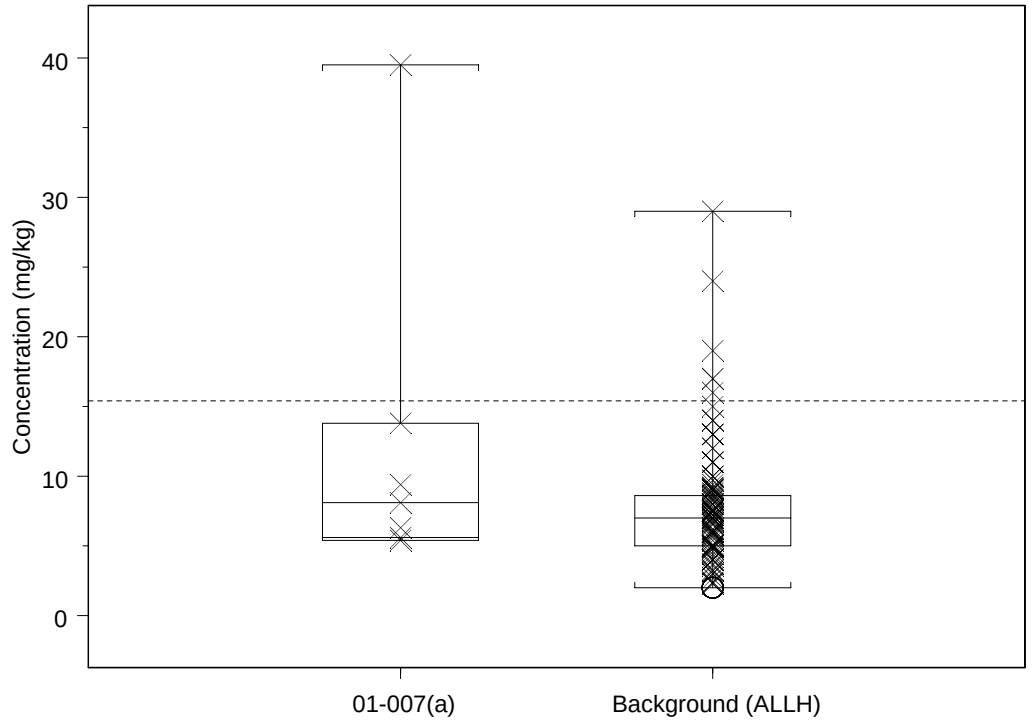


Figure F-3.26-6 Site concentrations of nickel in soil at SWMU 01-007(a) compared to background
(× = detect, ○ = nondetect)

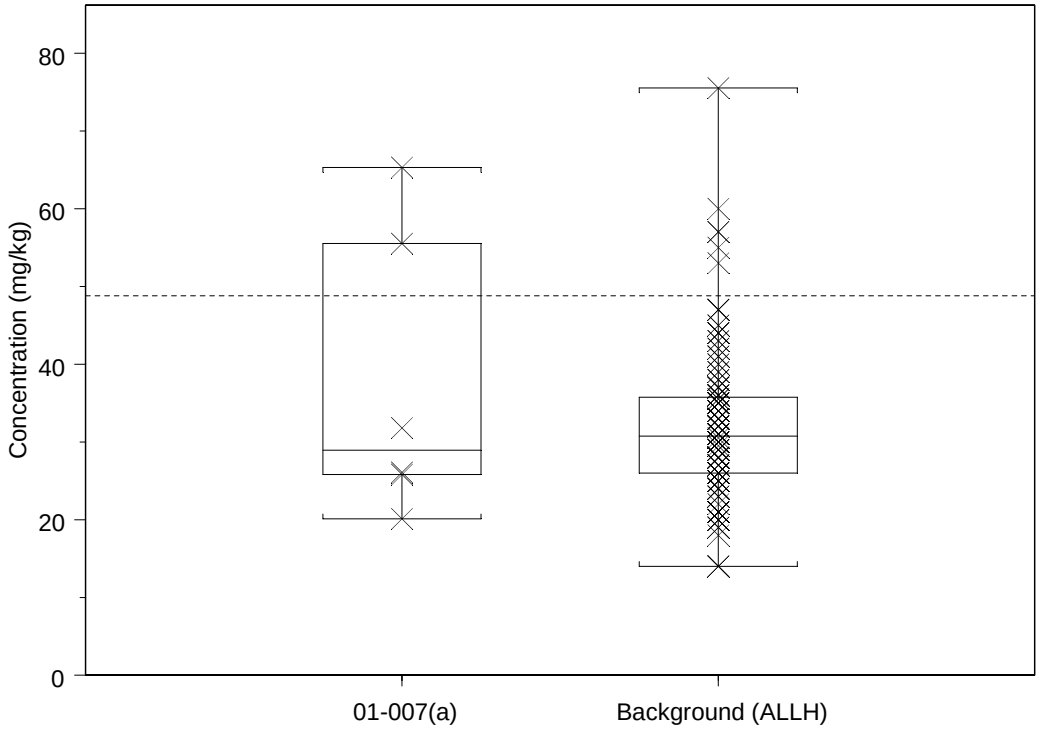


Figure F-3.26-7 Site concentrations of zinc in soil at SWMU 01-007(a) compared to background
(× = detect, ○ = nondetect)

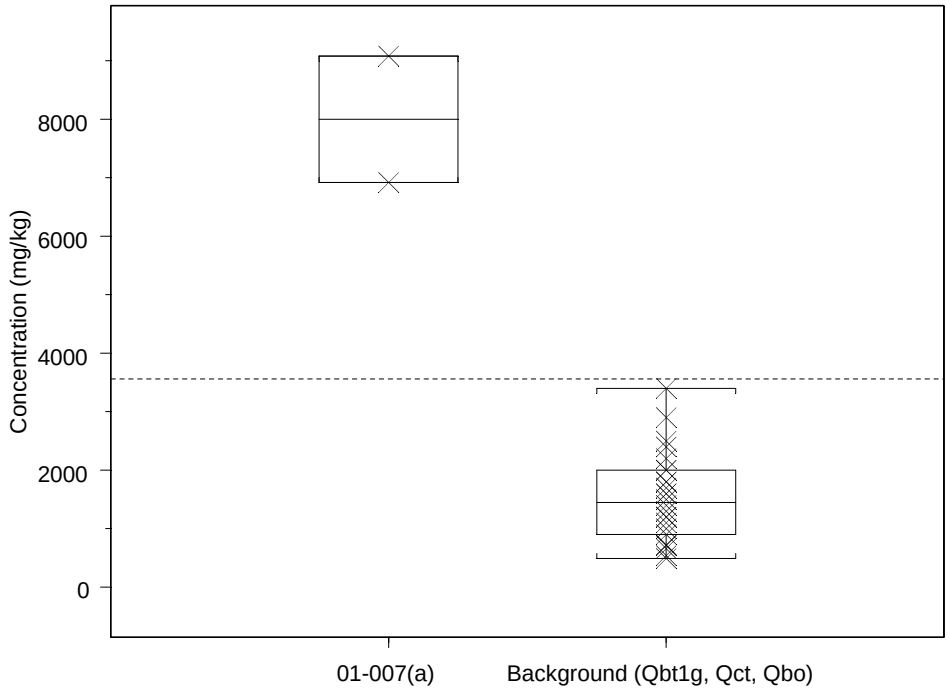


Figure F-3.26-8 Site concentrations of aluminum in Qbt1g at SWMU 01-007(a) compared to background

(× = detect, ○ = nondetect)

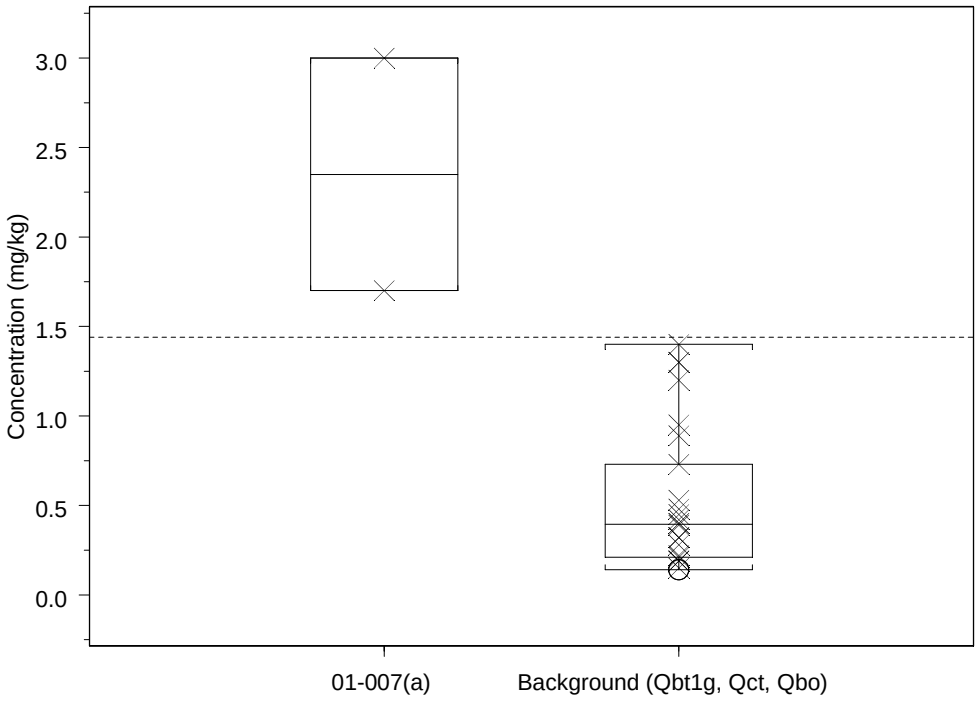


Figure F-3.26-9 Site concentrations of beryllium in Qbt1g at SWMU 01-007(a) compared to background

(× = detect, ○ = nondetect)

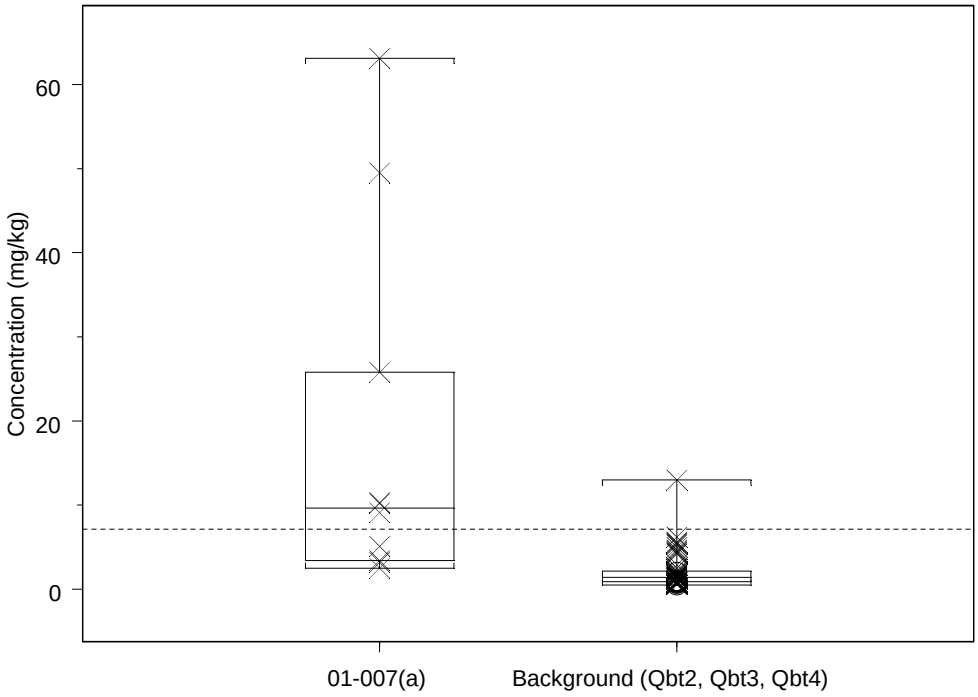


Figure F-3.26-10 Site concentrations of chromium in tuff at SWMU 01-007(a) compared to background

(× = detect, ○ = nondetect)

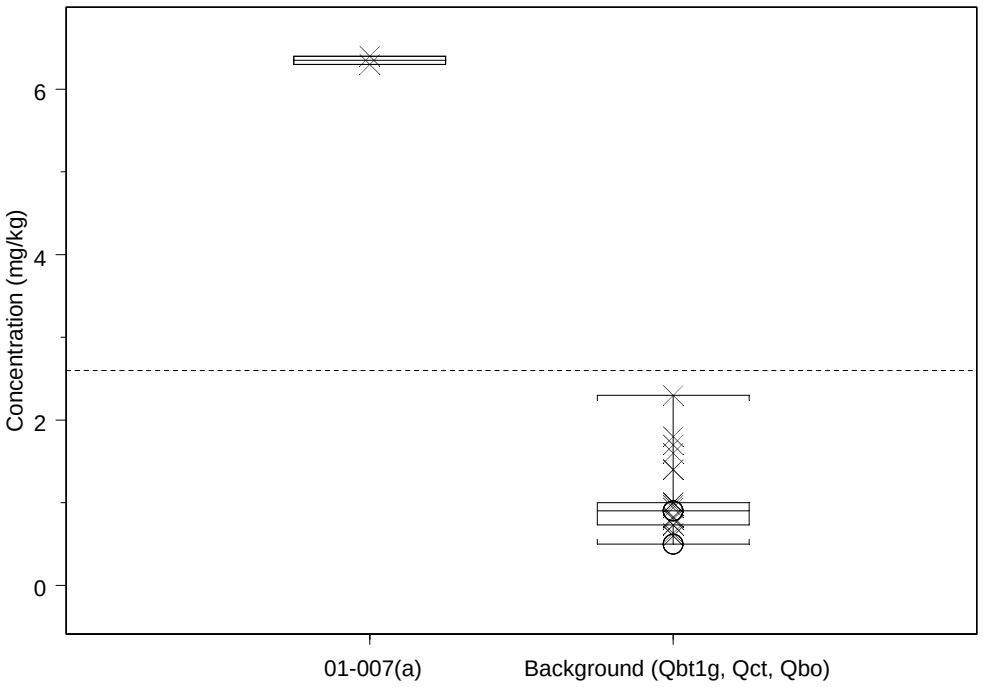


Figure F-3.26-11 Site concentrations of chromium in Qbt1g at SWMU 01-007(a) compared to background

(× = detect, ○ = nondetect)

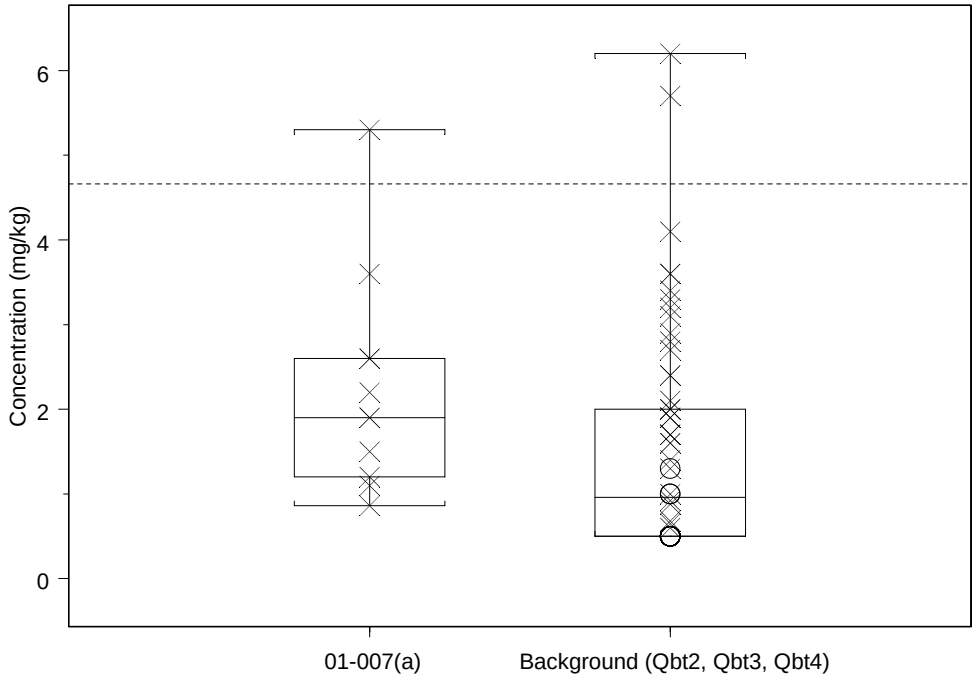


Figure F-3.26-12 Site concentrations of copper in tuff at SWMU 01-007(a) compared to background
(× = detect, ○ = nondetect)

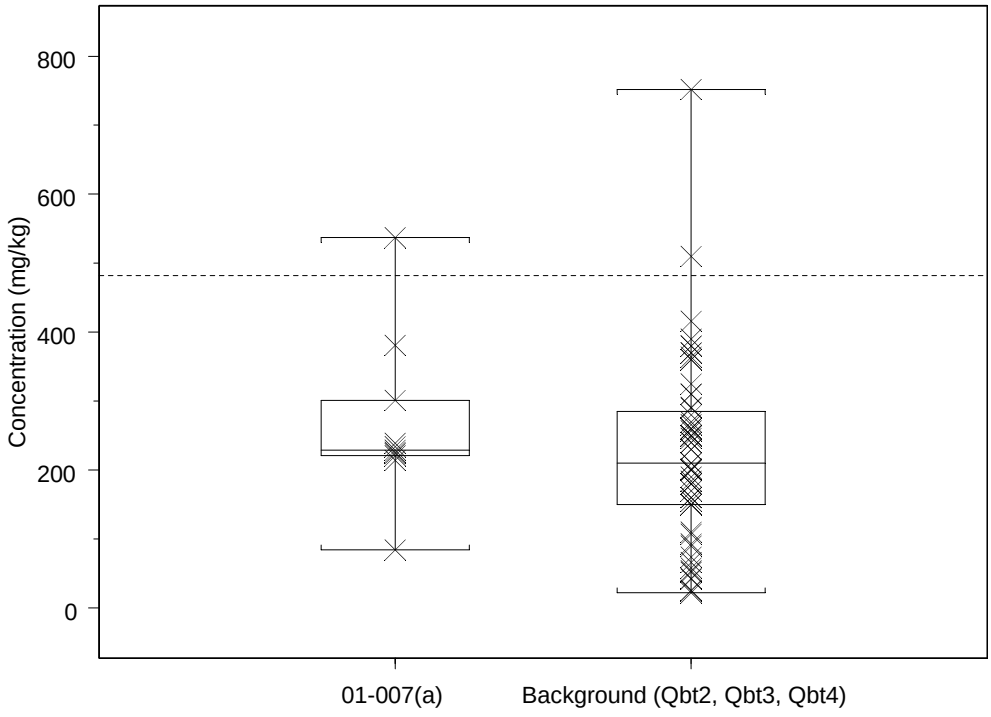


Figure F-3.26-13 Site concentrations of manganese in tuff at SWMU 01-007(a) compared to background
(× = detect, ○ = nondetect)

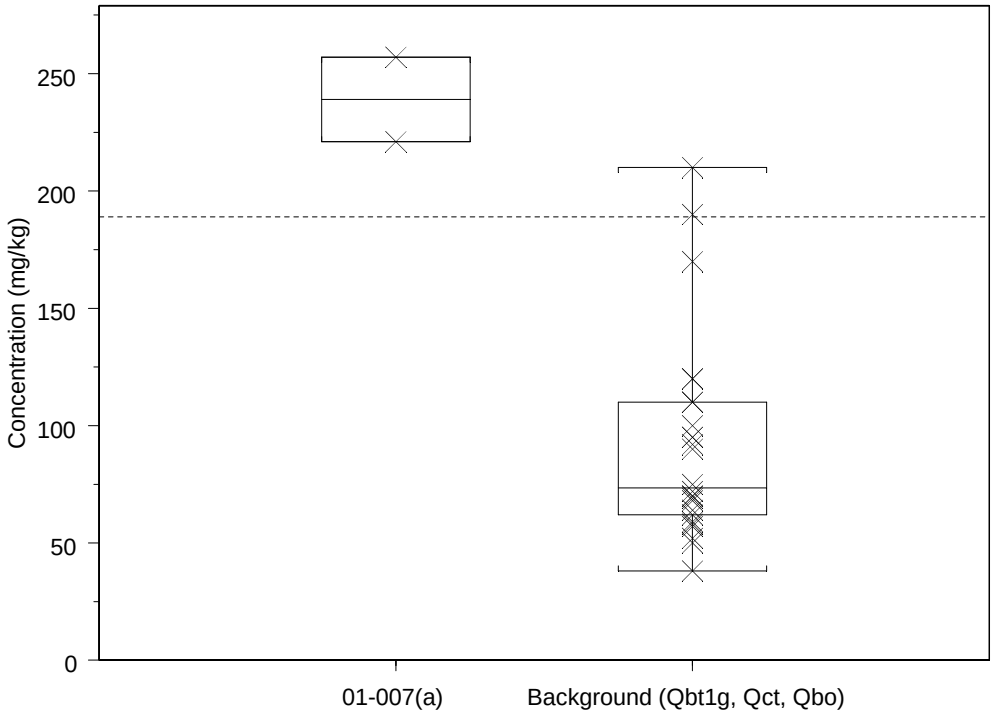


Figure F-3.26-14 Site concentrations of manganese in Qbt1g at SWMU 01-007(a) compared to background

(× = detect, ○ = nondetect)

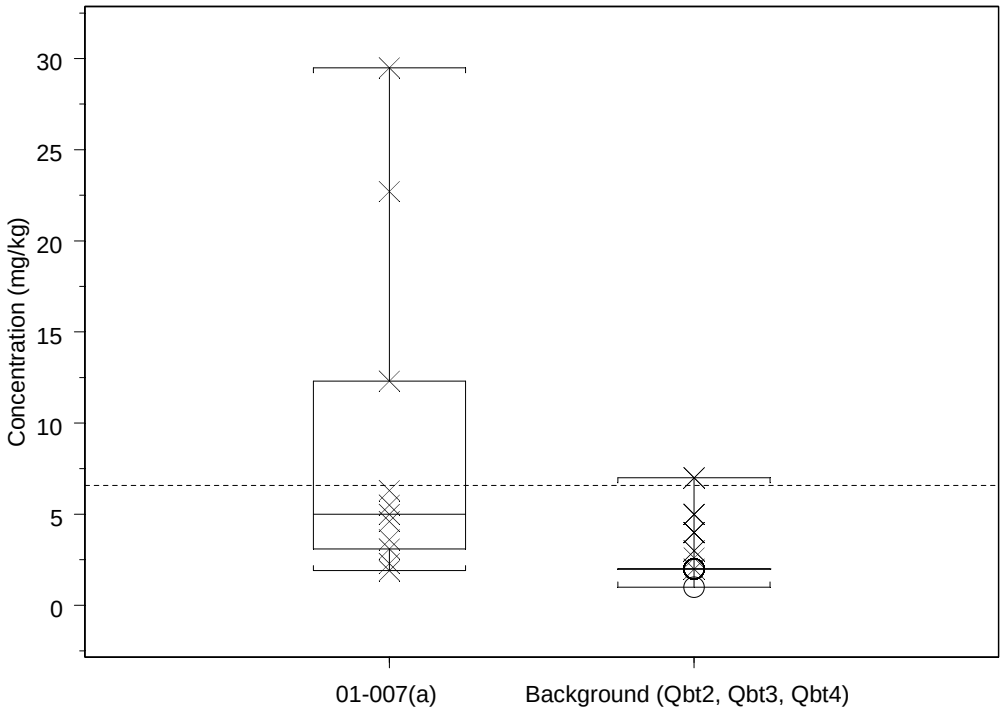


Figure F-3.26-15 Site concentrations of nickel in tuff at SWMU 01-007(a) compared to background

(× = detect, ○ = nondetect)

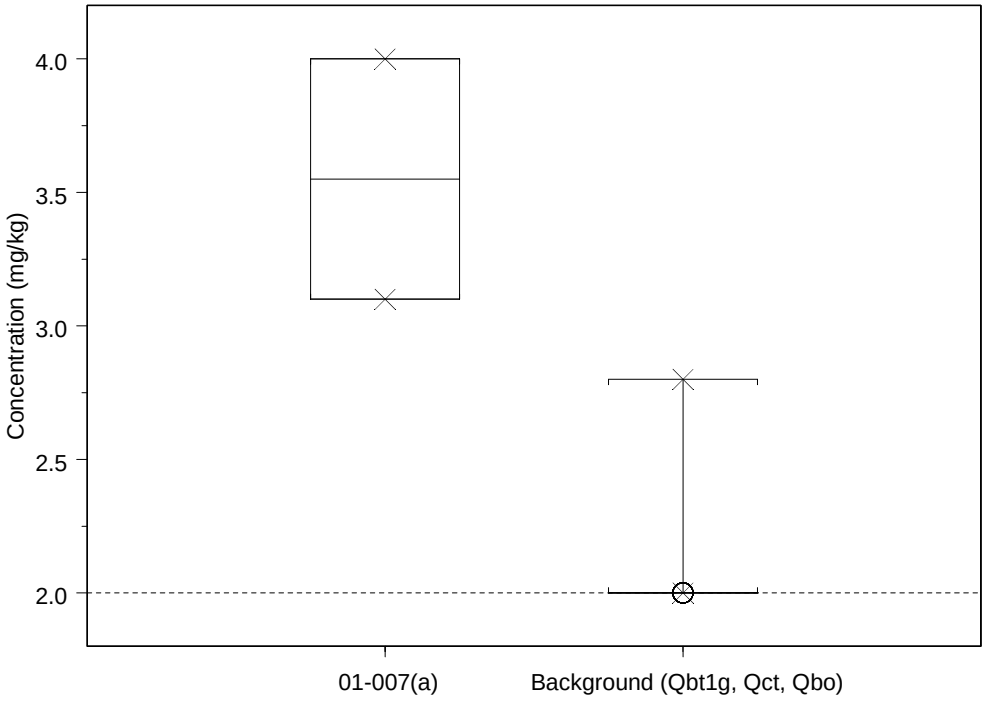


Figure F-3.26-16 Site concentrations of nickel in Qbt1g at SWMU 01-007(a) compared to background

(× = detect, ○ = nondetect)

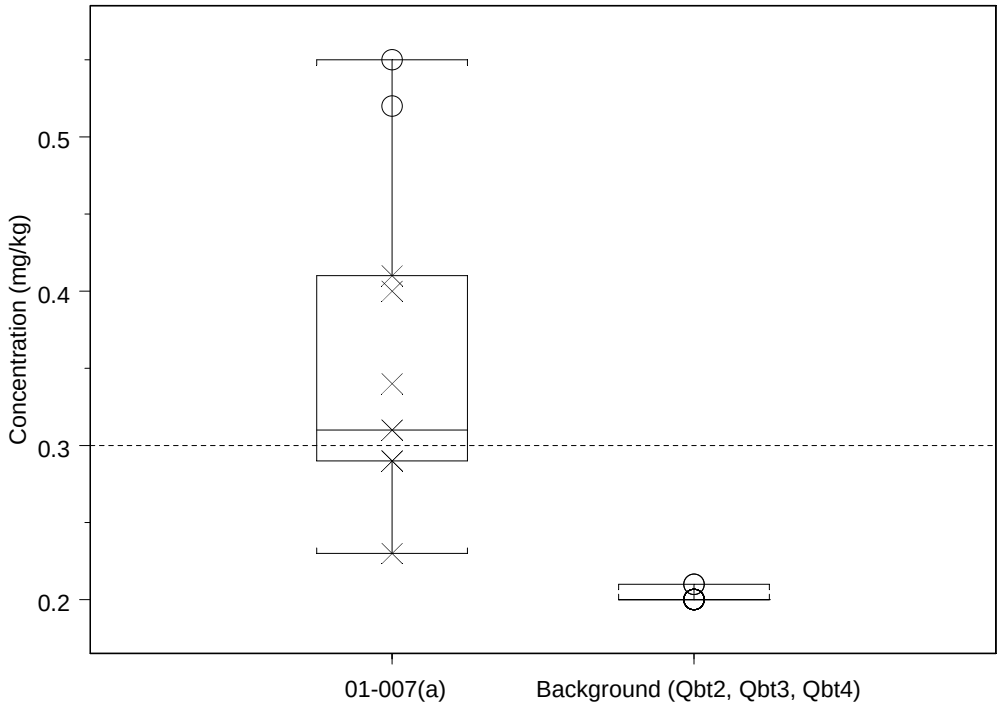


Figure F-3.26-17 Site concentrations of selenium in tuff at SWMU 01-007(a) compared to background

(× = detect, ○ = nondetect)

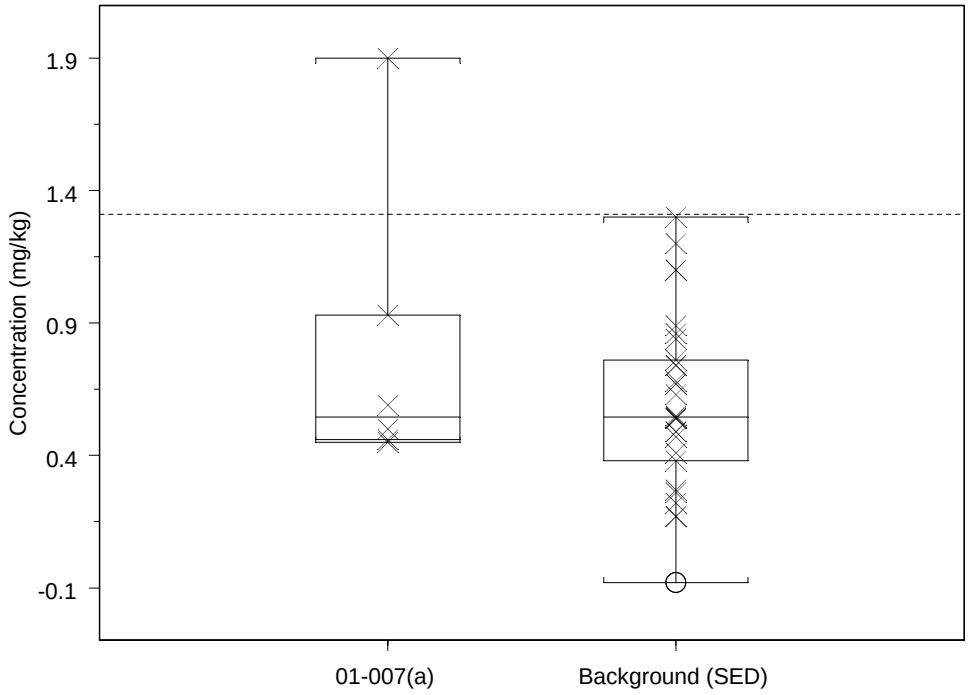


Figure F-3.26-18 Site concentrations of beryllium in sediment at SWMU 01-007(a) compared to background

(× = detect, ○ = nondetect)

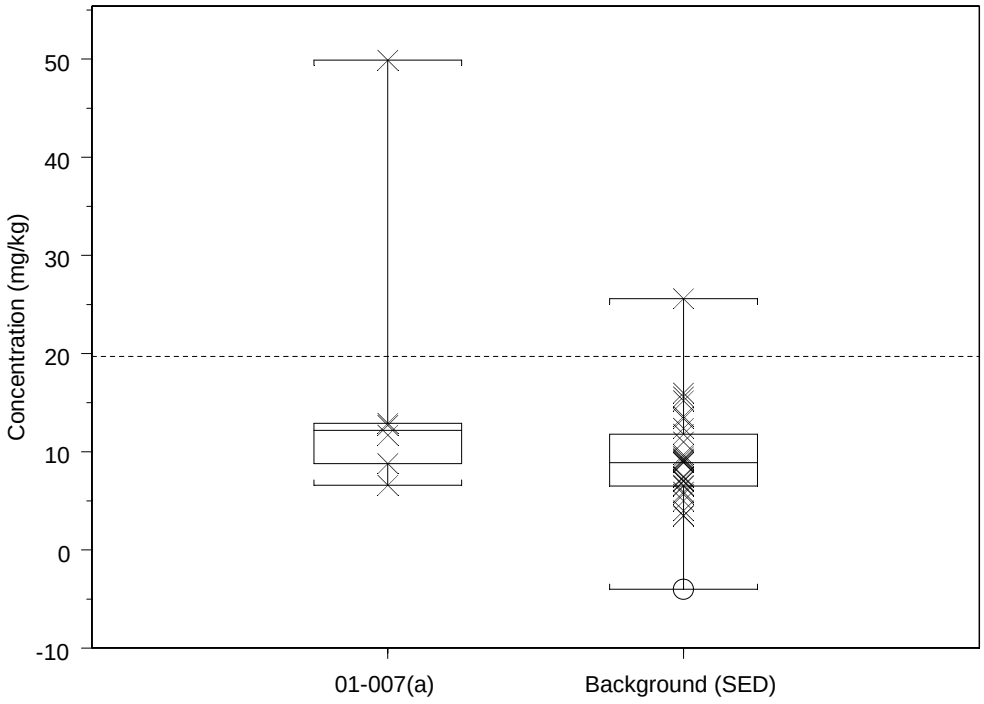


Figure F-3.26-19 Site concentrations of lead in sediment at SWMU 01-007(a) compared to background

(× = detect, ○ = nondetect)

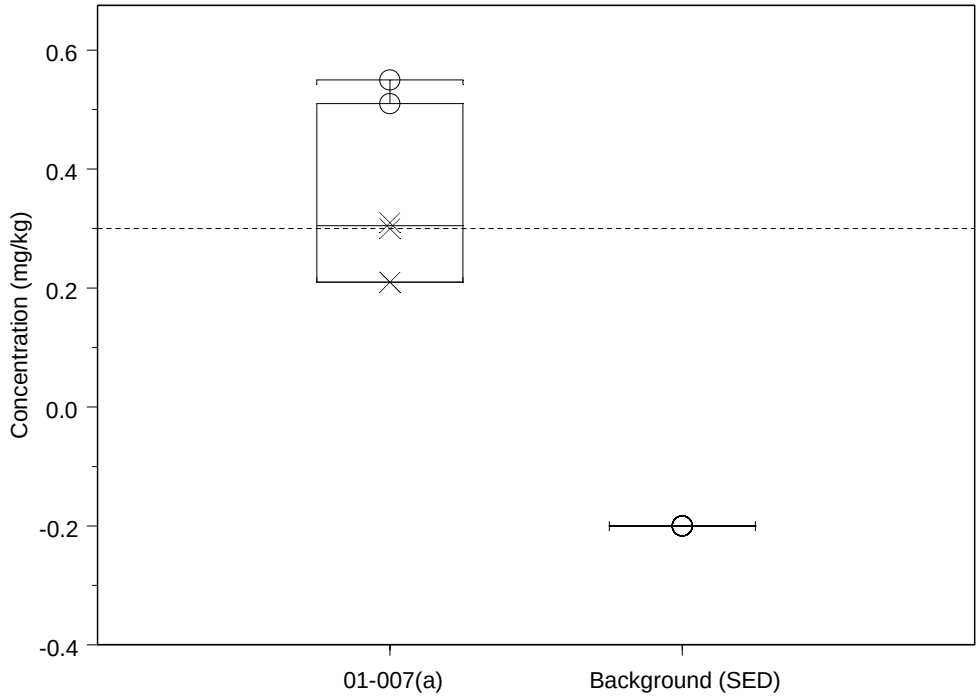


Figure F-3.26-20 Site concentrations of selenium in sediment at SWMU 01-007(a) compared to background

(× = detect, ○ = nondetect)

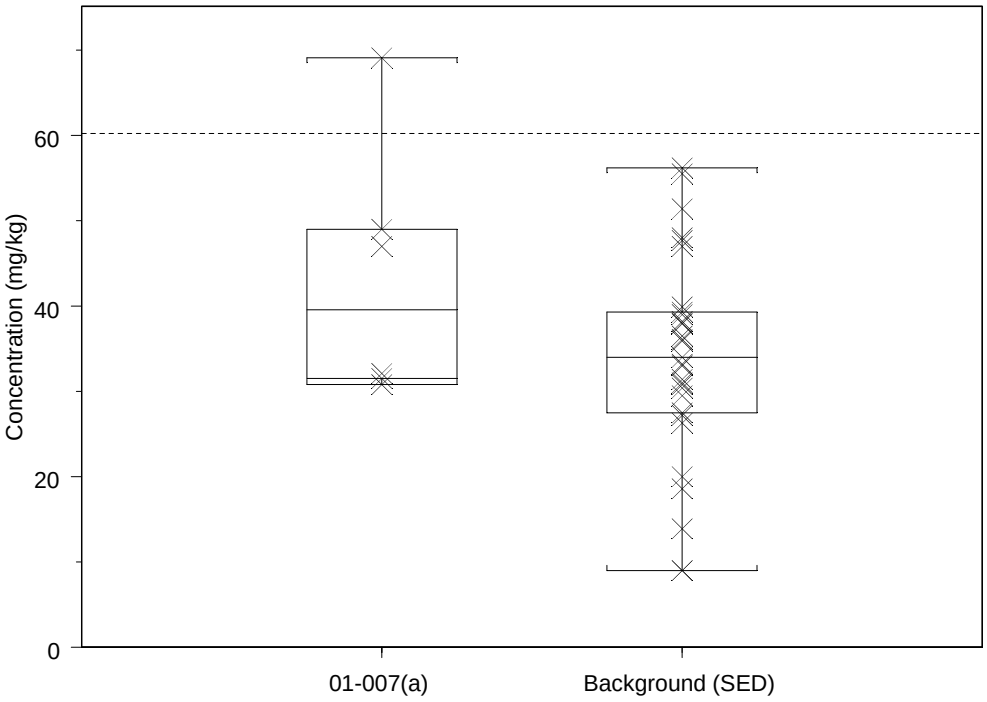


Figure F-3.26-21 Site concentrations of zinc in sediment at SWMU 01-007(a) compared to background

(× = detect, ○ = nondetect)

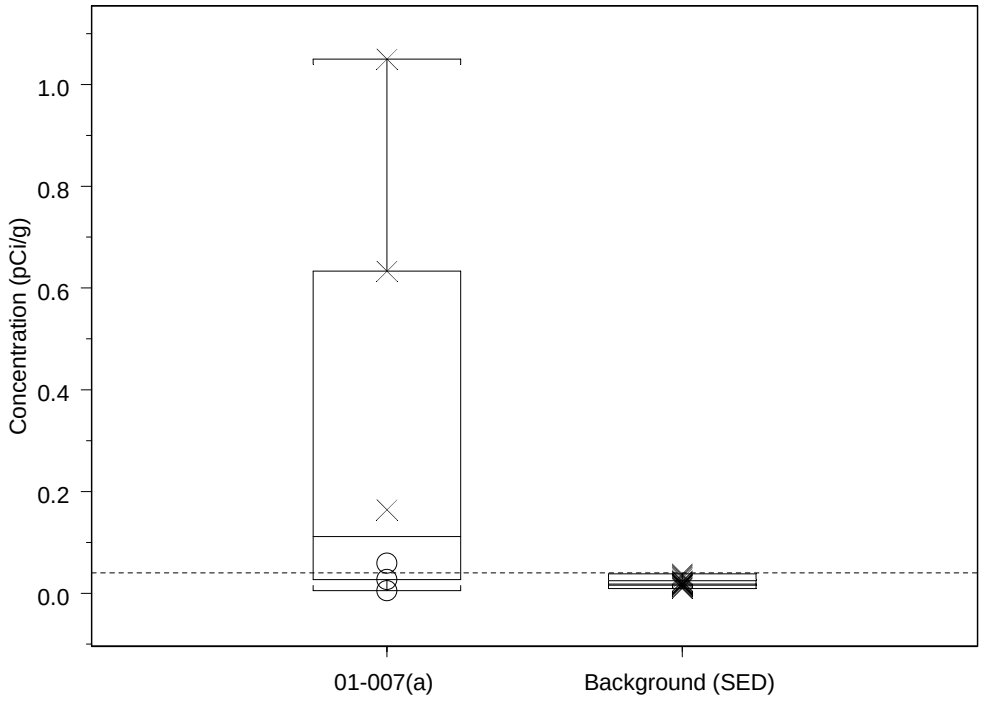


Figure F-3.26-22 Site concentrations of americium-241 in sediment at SWMU 01-007(a) compared to background

(× = detect, ○ = nondetect)

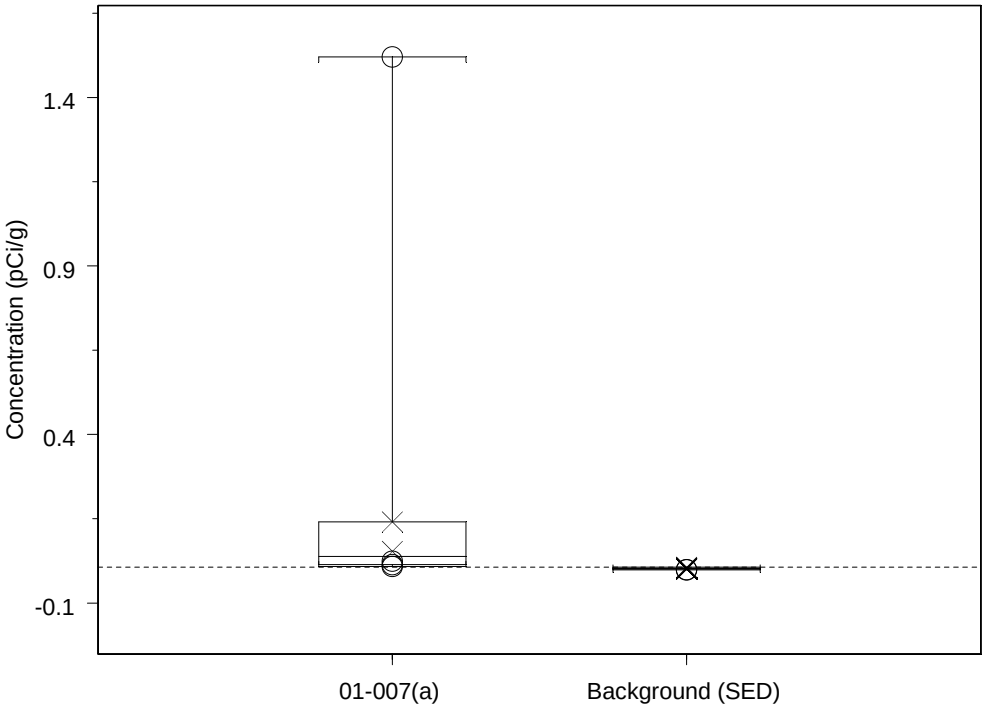


Figure F-3.26-23 Site concentrations of plutonium-238 in sediment at SWMU 01-007(a) compared to background

(× = detect, ○ = nondetect)

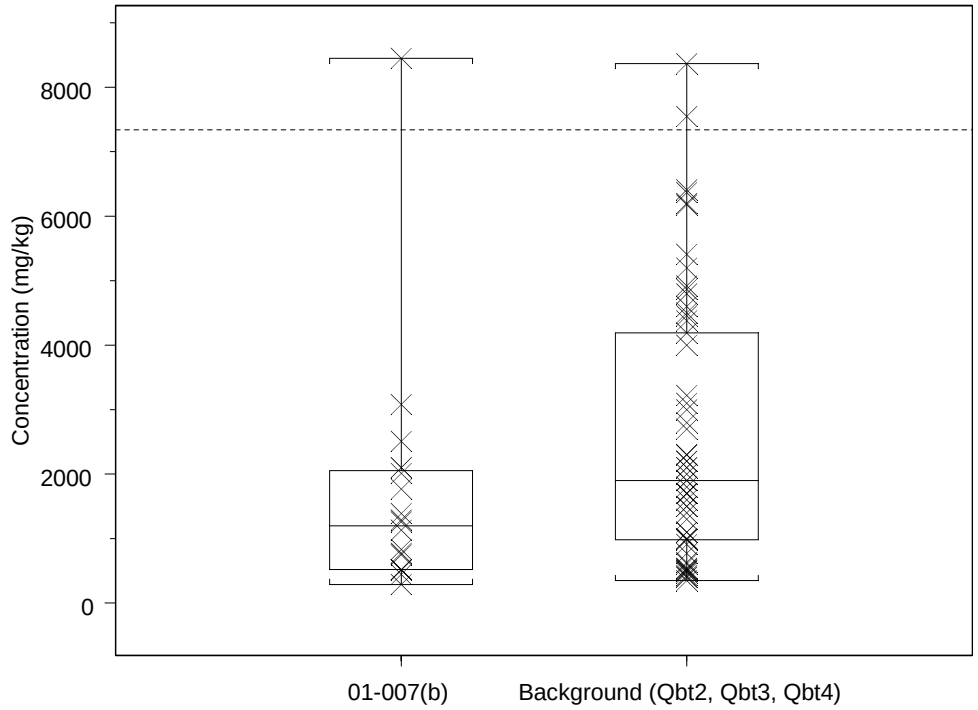


Figure F-3.27-1 Site concentrations of aluminum in tuff at SWMU 01-007(b) compared to background

(× = detect, ○ = nondetect)

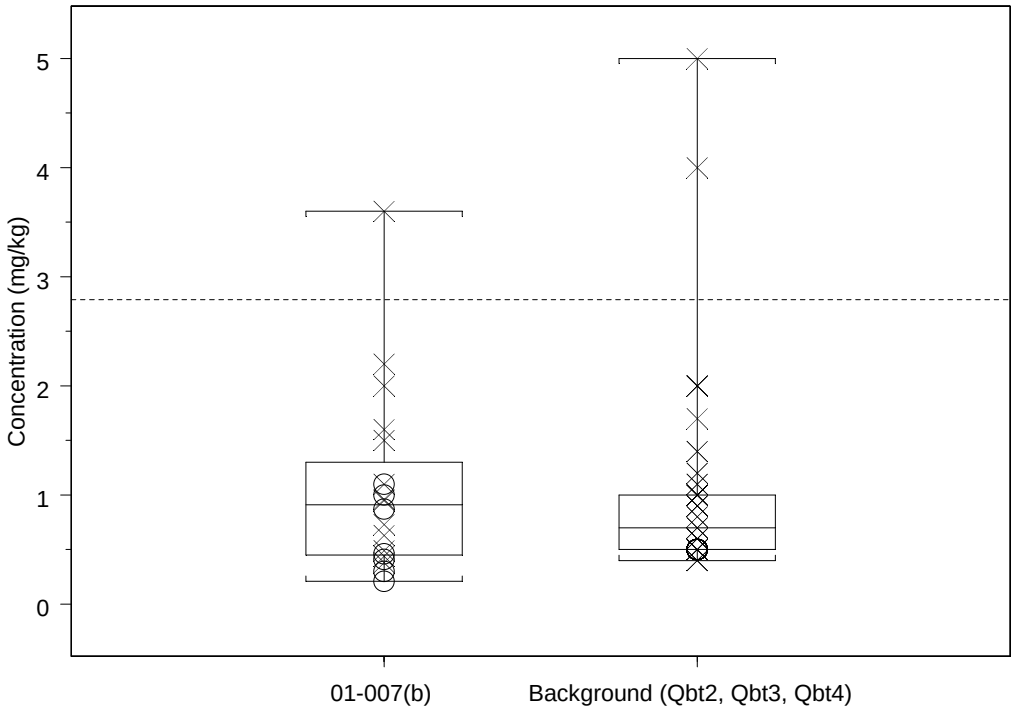


Figure F-3.27-2 Site concentrations of arsenic in tuff at SWMU 01-007(b) compared to background

(× = detect, ○ = nondetect)

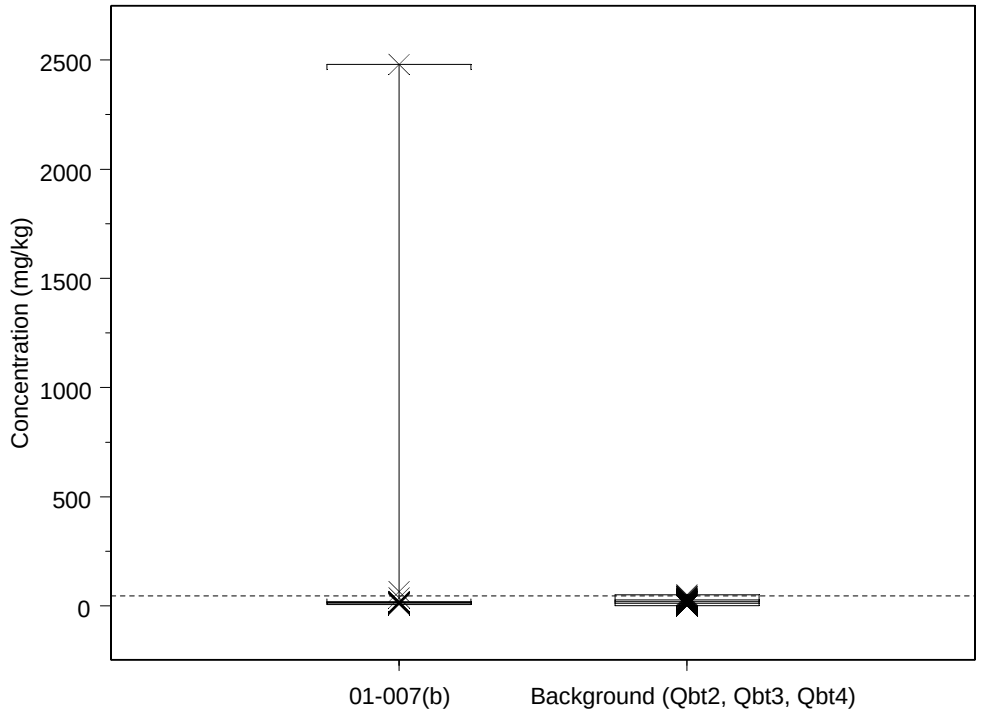


Figure F-3.27-3 Site concentrations of barium in tuff at SWMU 01-007(b) compared to background
(× = detect, ○ = nondetect)

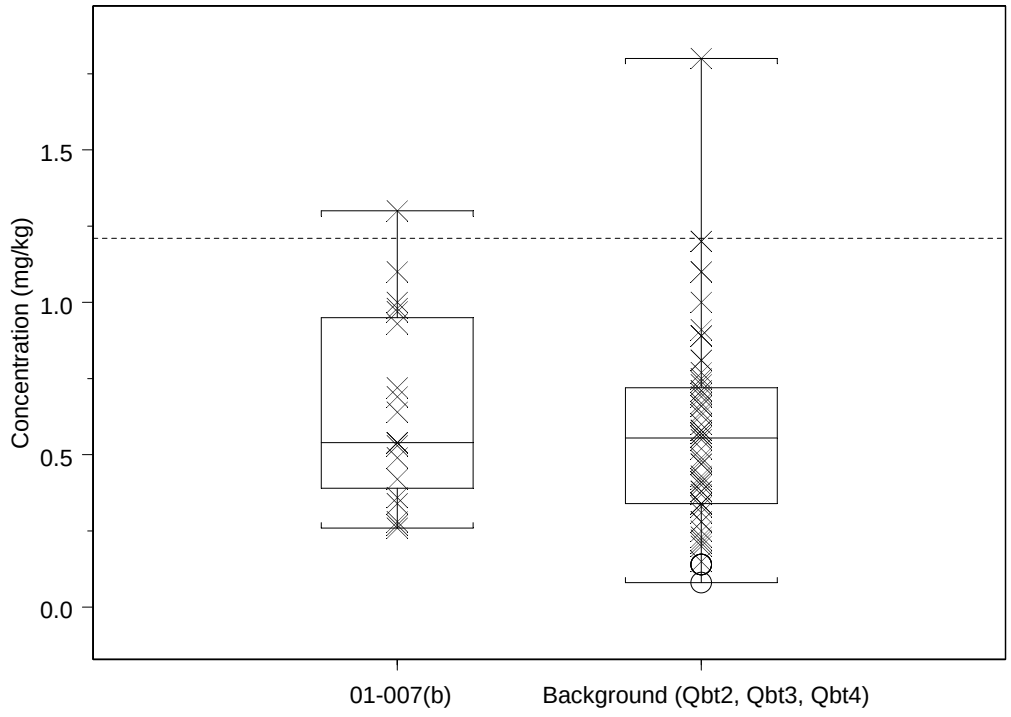


Figure F-3.27-4 Site concentrations of beryllium in tuff at SWMU 01-007(b) compared to background
(× = detect, ○ = nondetect)

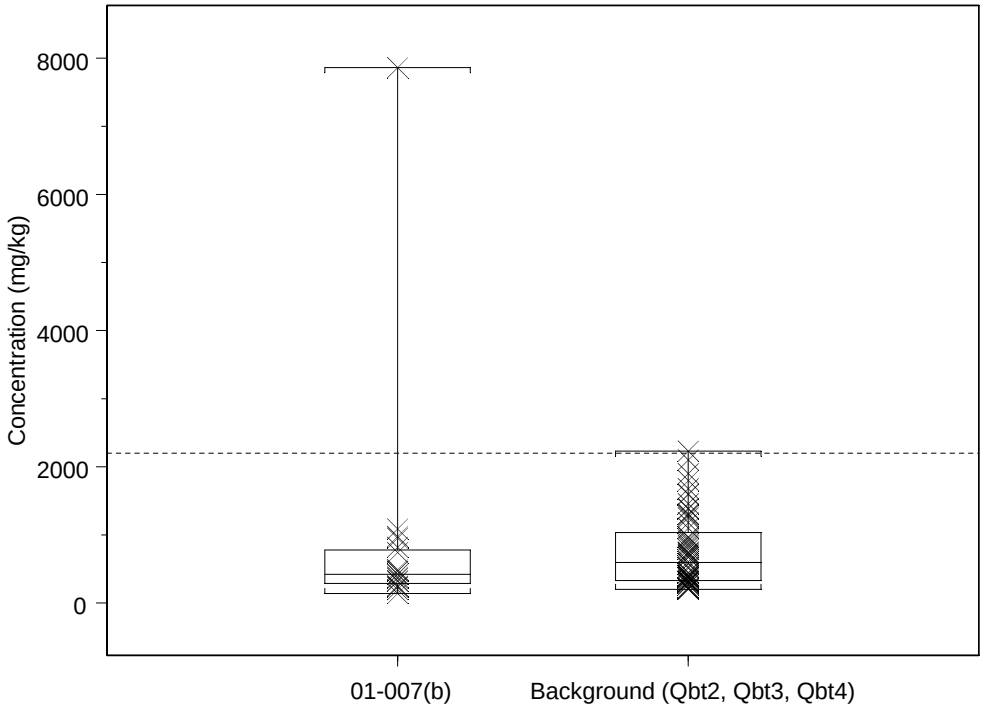


Figure F-3.27-5 Site concentrations of calcium in tuff at SWMU 01-007(b) compared to background

(× = detect, ○ = nondetect)

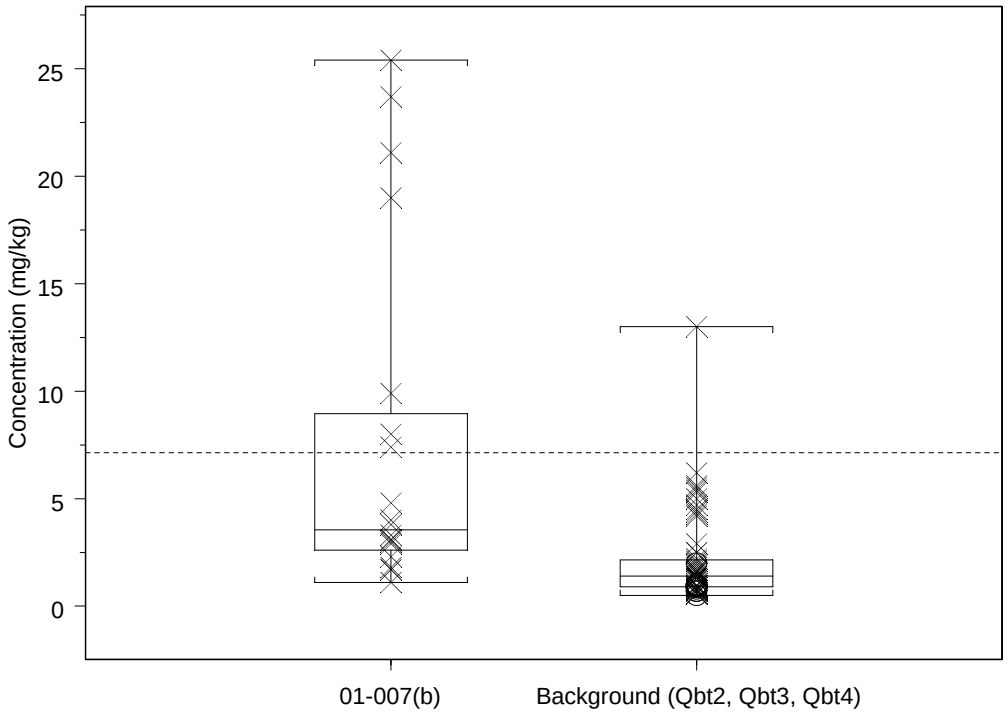


Figure F-3.27-6 Site concentrations of chromium in tuff at SWMU 01-007(b) compared to background

(× = detect, ○ = nondetect)

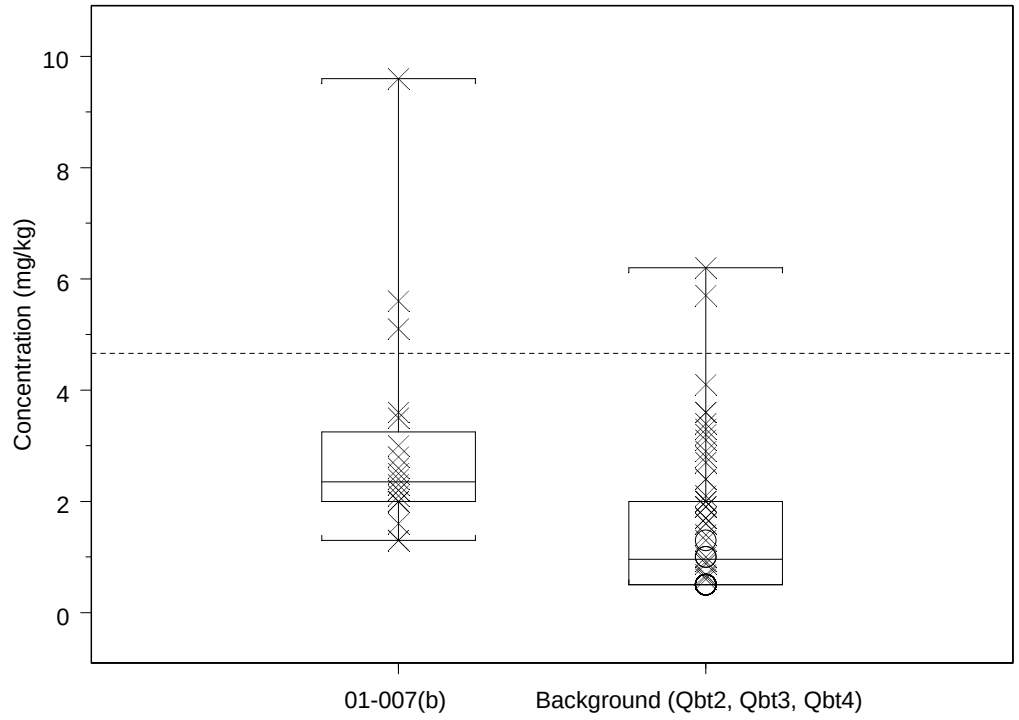


Figure F-3.27-7 Site concentrations of copper in tuff at SWMU 01-007(b) compared to background
(× = detect, ○ = nondetect)

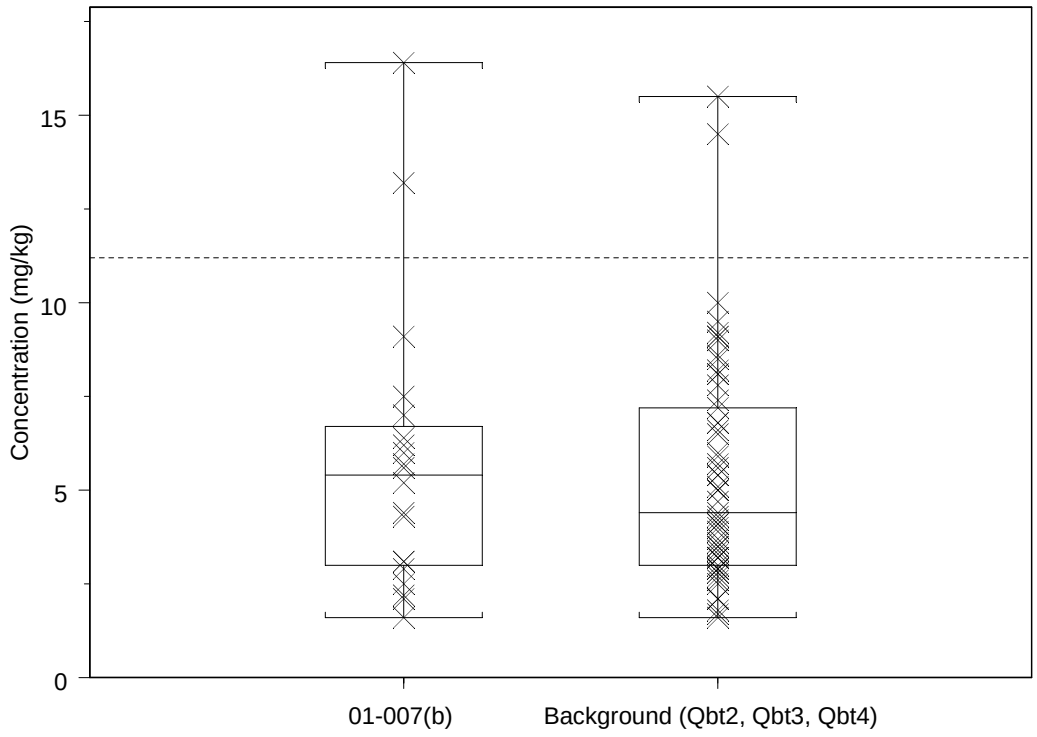


Figure F-3.27-8 Site concentrations of lead in tuff at SWMU 01-007(b) compared to background
(× = detect, ○ = nondetect)

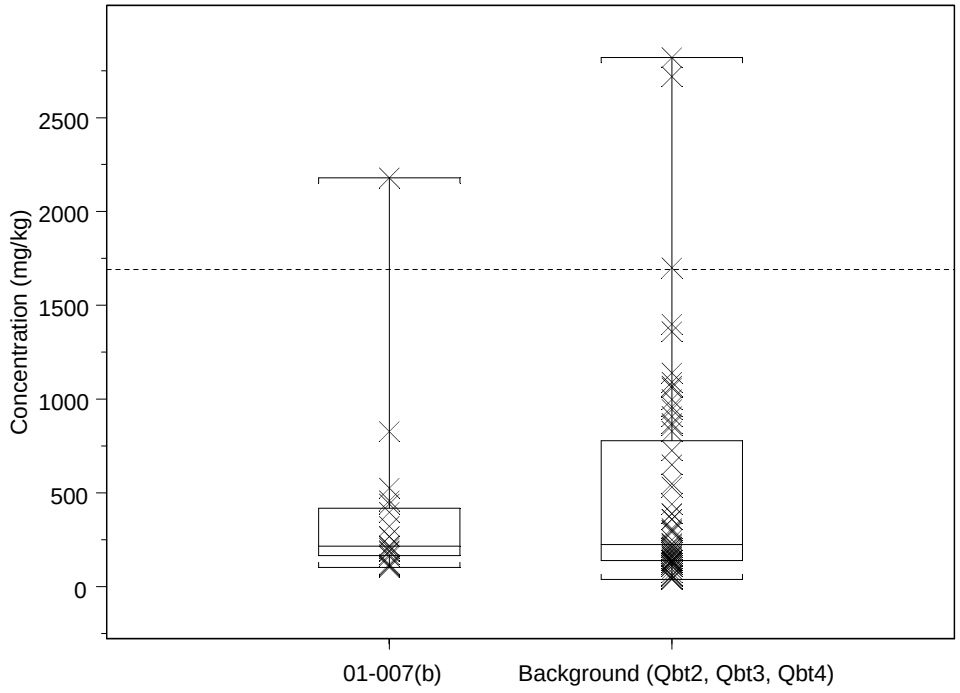


Figure F-3.27-9 Site concentrations of magnesium in tuff at SWMU 01-007(b) compared to background

(× = detect, ○ = nondetect)

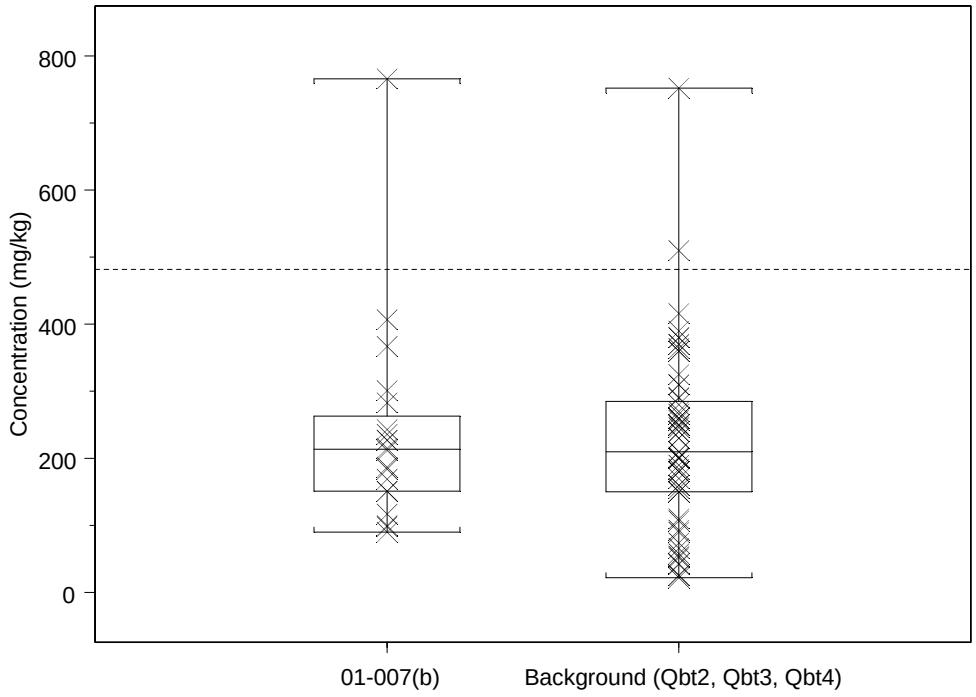


Figure F-3.27-10 Site concentrations of manganese in tuff at SWMU 01-007(b) compared to background

(× = detect, ○ = nondetect)

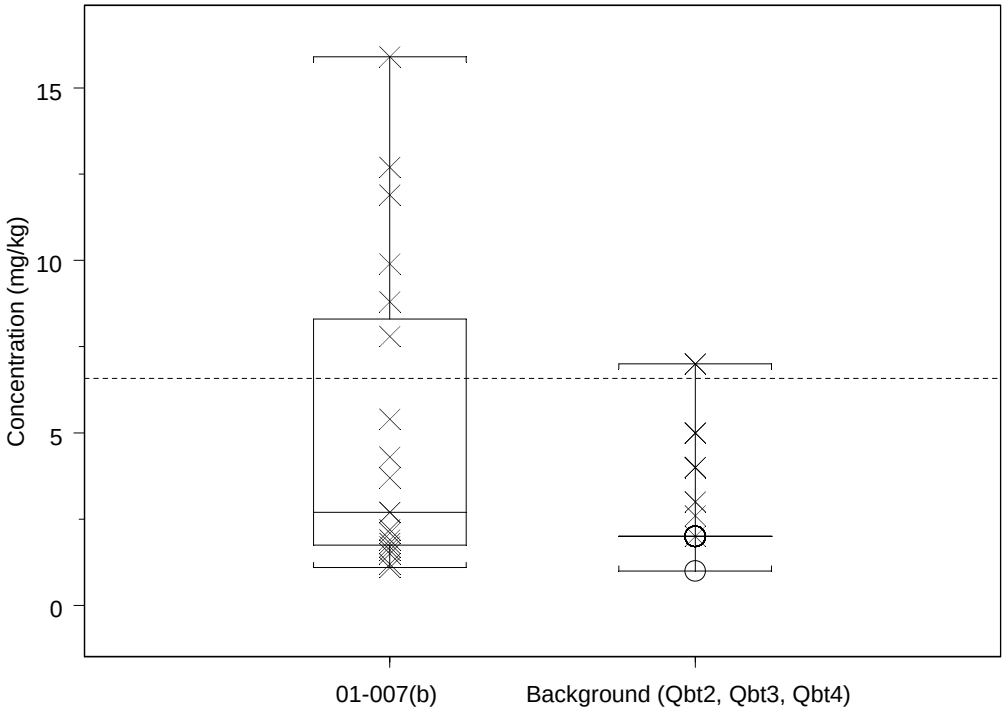


Figure F-3.27-11 Site concentrations of nickel in tuff at SWMU 01-007(b) compared to background
(× = detect, ○ = nondetect)

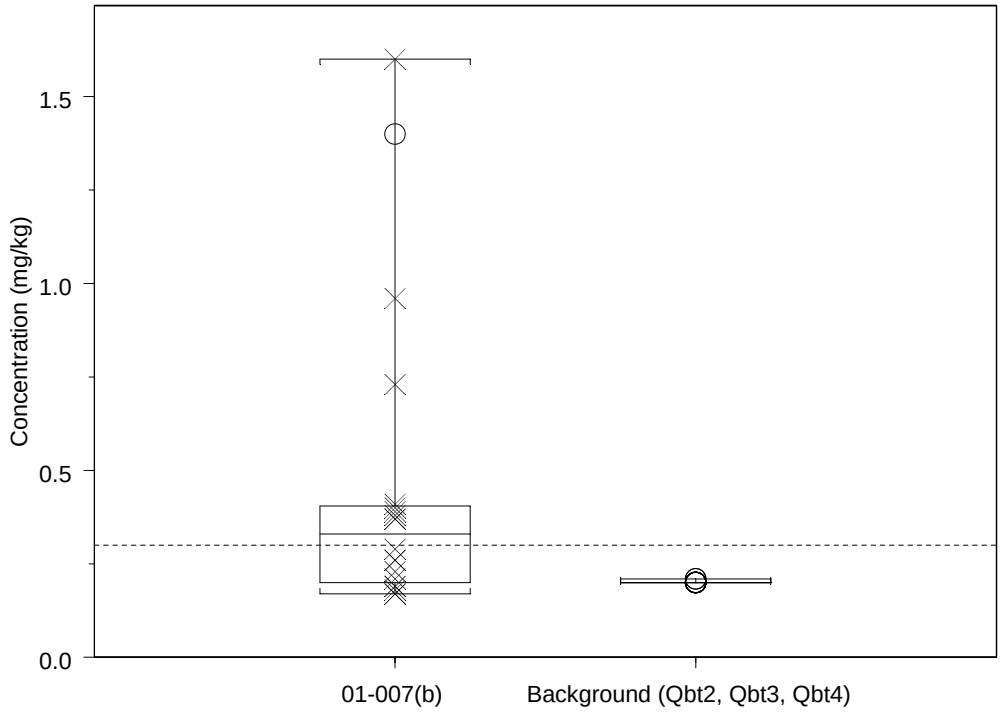


Figure F-3.27-12 Site concentrations of selenium in tuff at SWMU 01-007(b) compared to background
(× = detect, ○ = nondetect)

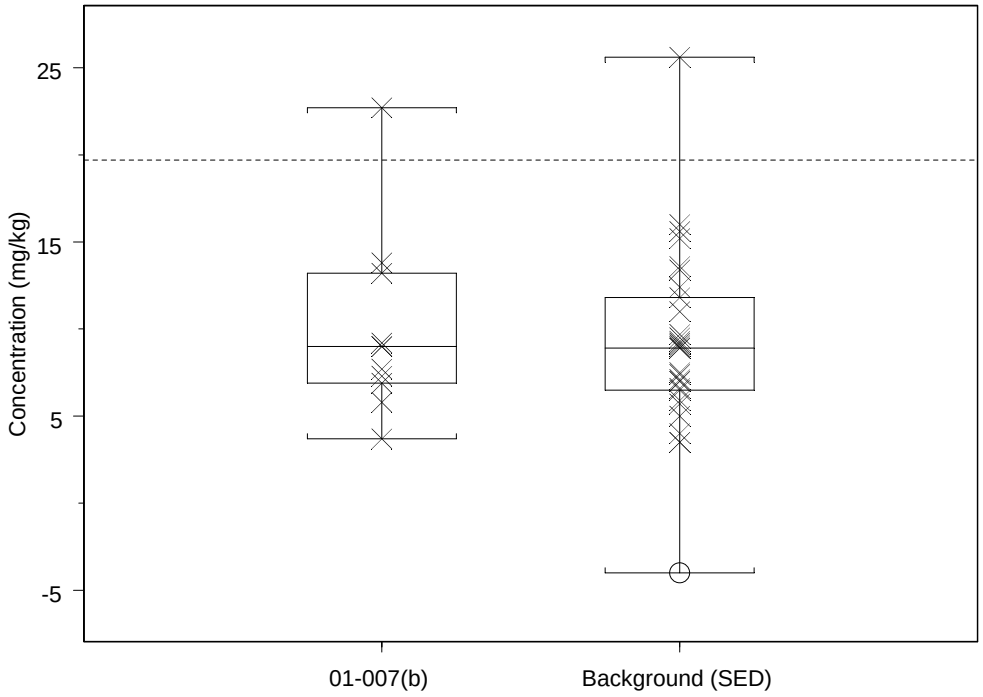


Figure F-3.27-13 Site concentrations of lead in sediment at SWMU 01-007(b) compared to background

(× = detect, ○ = nondetect)

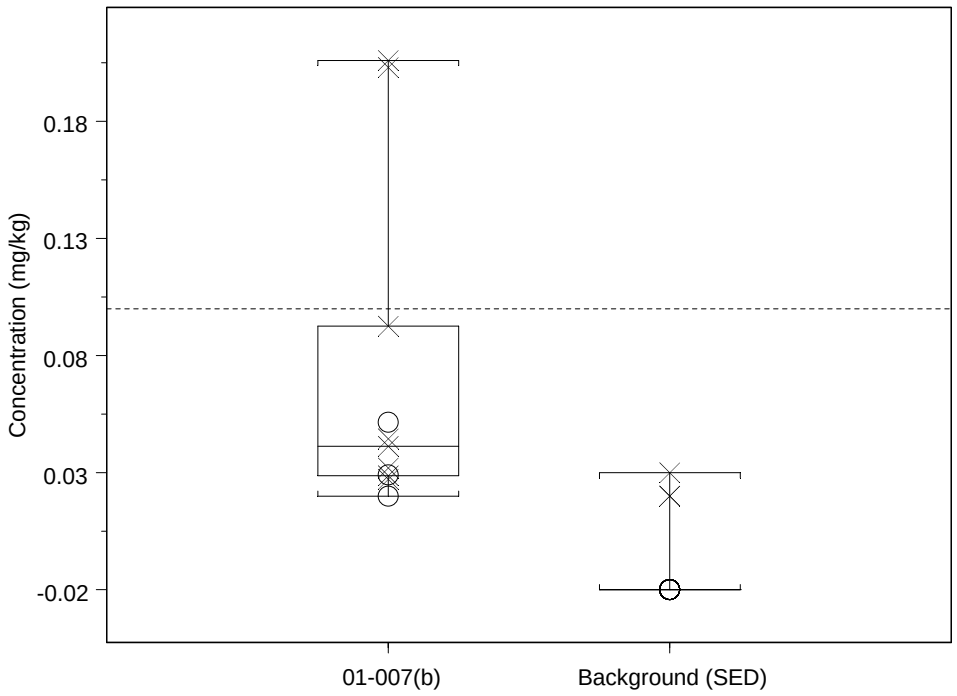


Figure F-3.27-14 Site concentrations of mercury in sediment at SWMU 01-007(b) compared to background

(× = detect, ○ = nondetect)

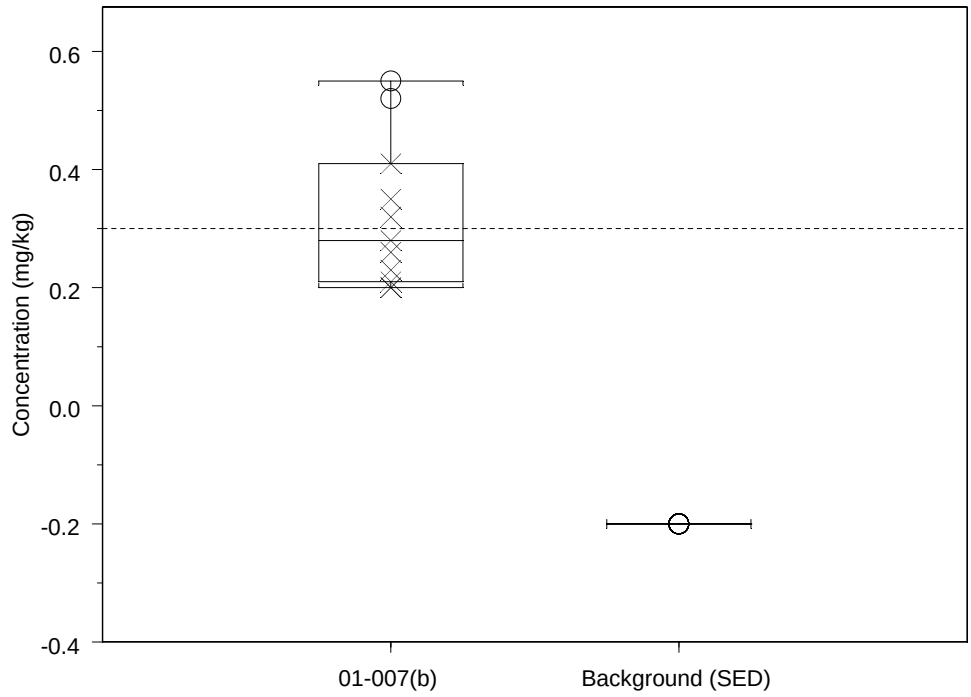


Figure F-3.27-15 Site concentrations of selenium in sediment at SWMU 01-007(b) compared to background

(× = detect, ○ = nondetect)

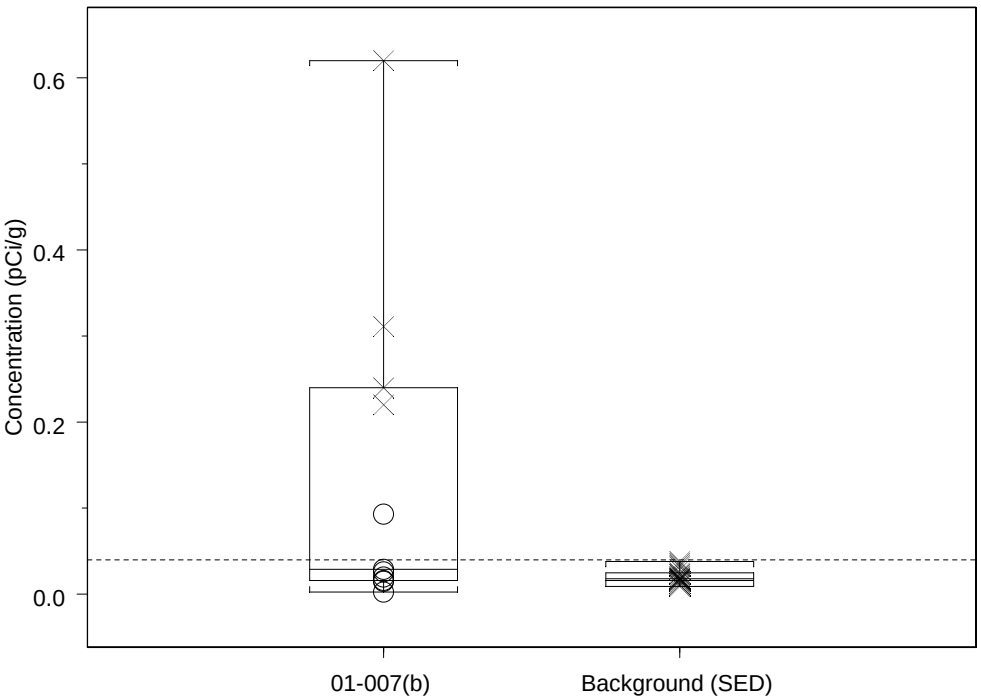


Figure F-3.27-16 Site concentrations of americium-241 in sediment at SWMU 01-007(b) compared to background

(× = detect, ○ = nondetect)

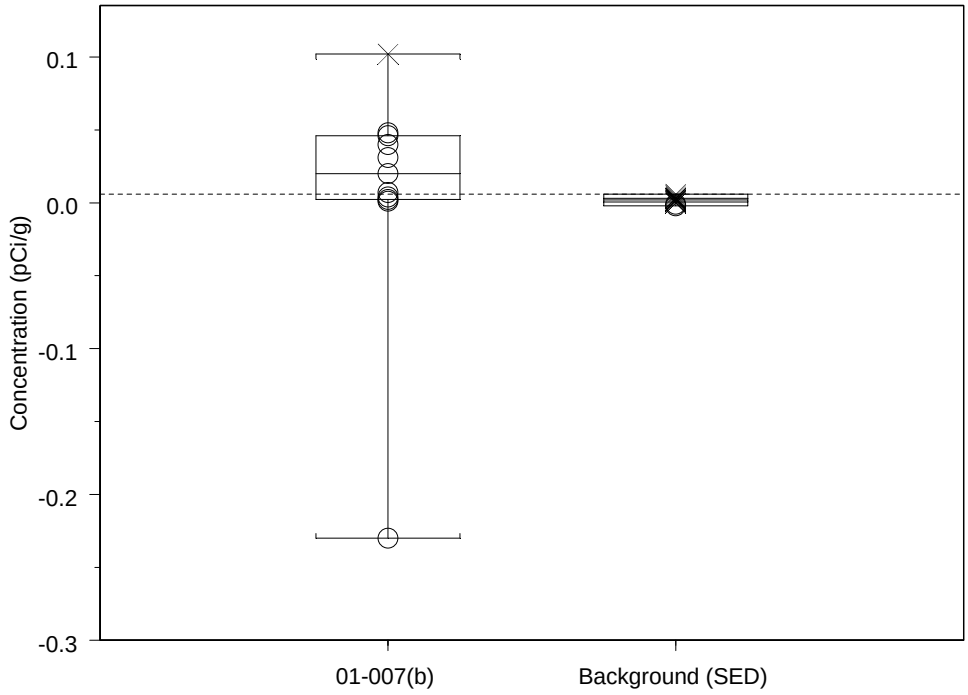


Figure F-3.27-17 Site concentrations of plutonium-238 in sediment at SWMU 01-007(b) compared to background

(× = detect, ○ = nondetect)

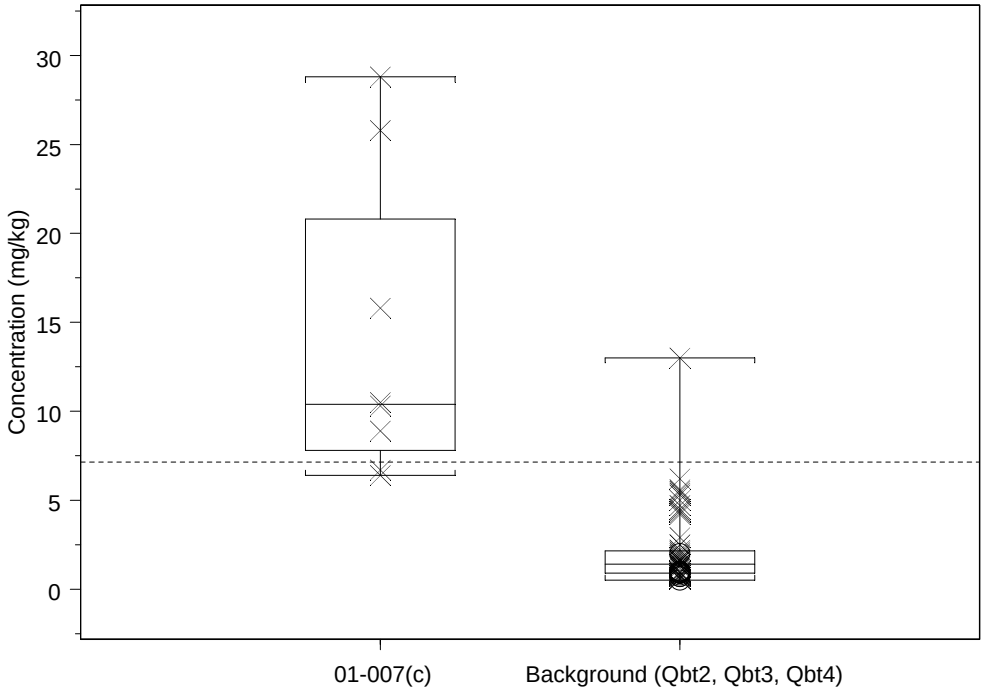


Figure F-3.28-1 Site concentrations of chromium in tuff at SWMU 01-007(c) compared to background

(× = detect, ○ = nondetect)

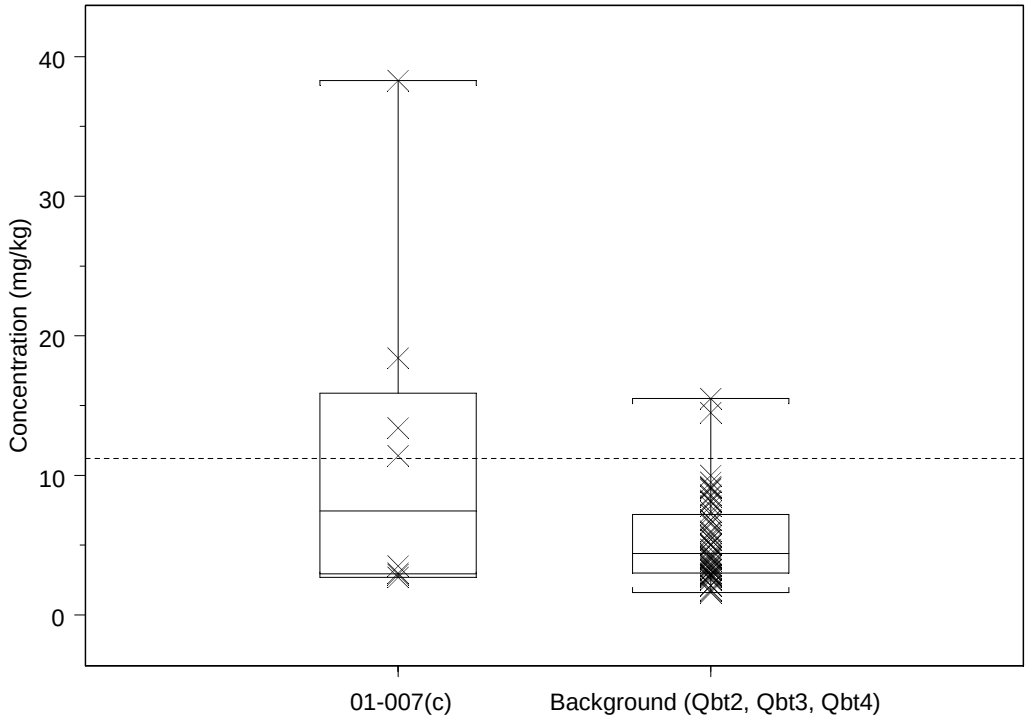


Figure F-3.28-2 Site concentrations of lead in tuff at SWMU 01-007(c) compared to background
(× = detect, ○ = nondetect)

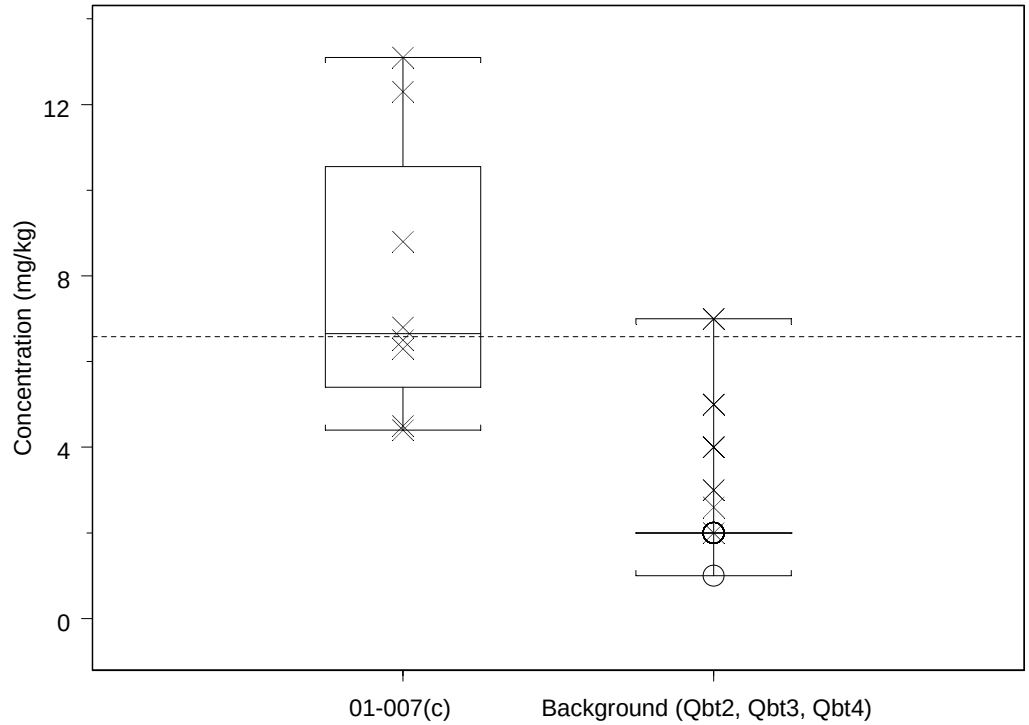


Figure F-3.28-3 Site concentrations of nickel in tuff at SWMU 01-007(c) compared to background
(× = detect, ○ = nondetect)

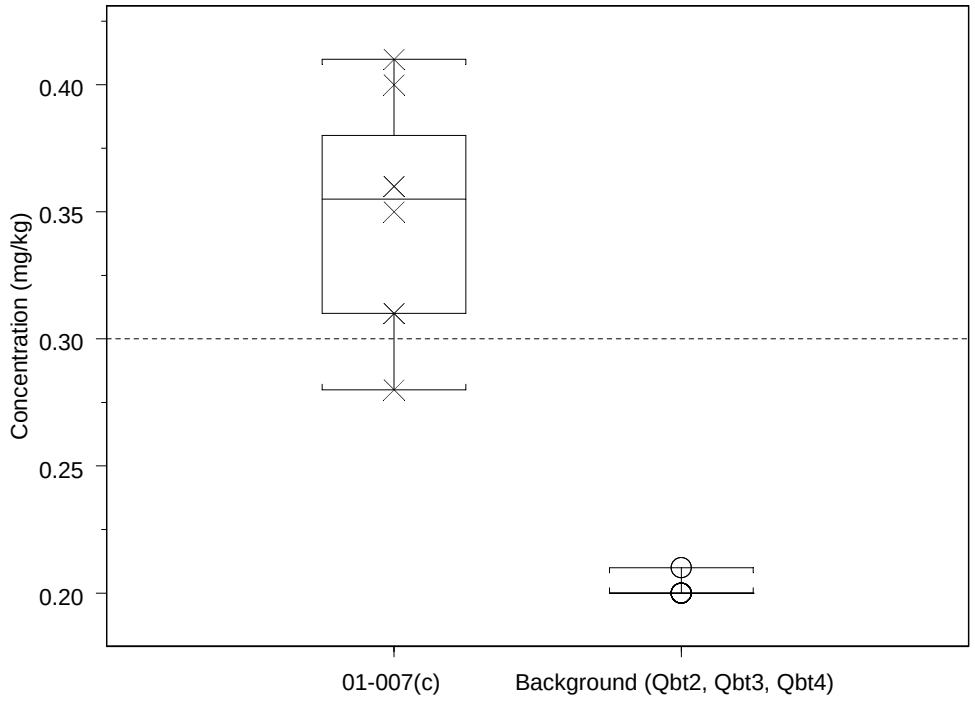


Figure F-3.28-4 Site concentrations of selenium in tuff at SWMU 01-007(c) compared to background

(× = detect, ○ = nondetect)

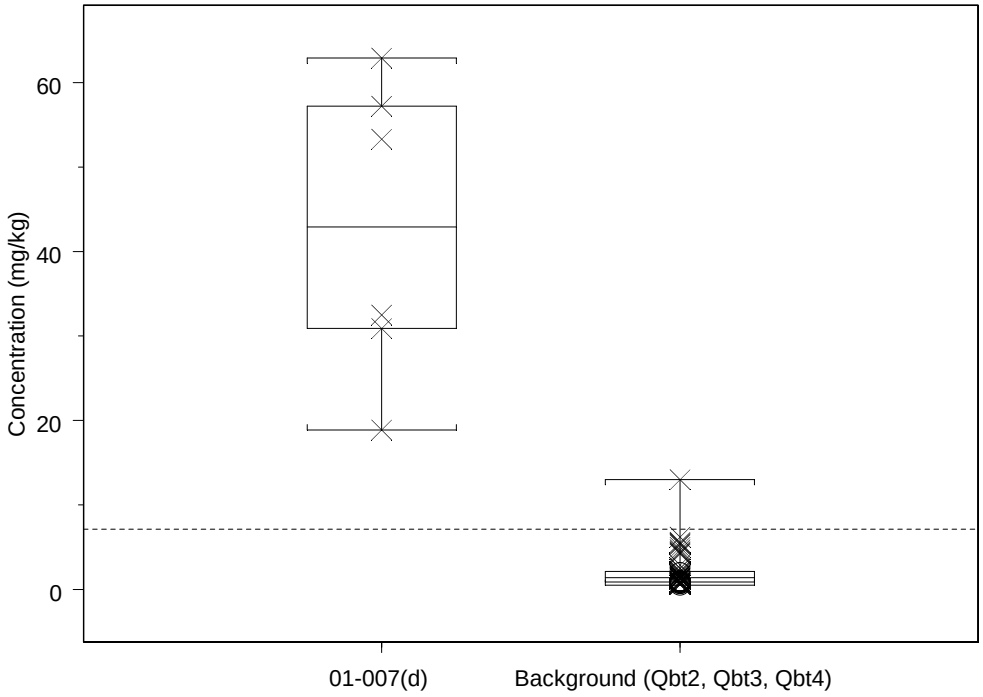


Figure F-3.29-1 Site concentrations of chromium in tuff at SWMU 01-007(d) compared to background

(× = detect, ○ = nondetect)

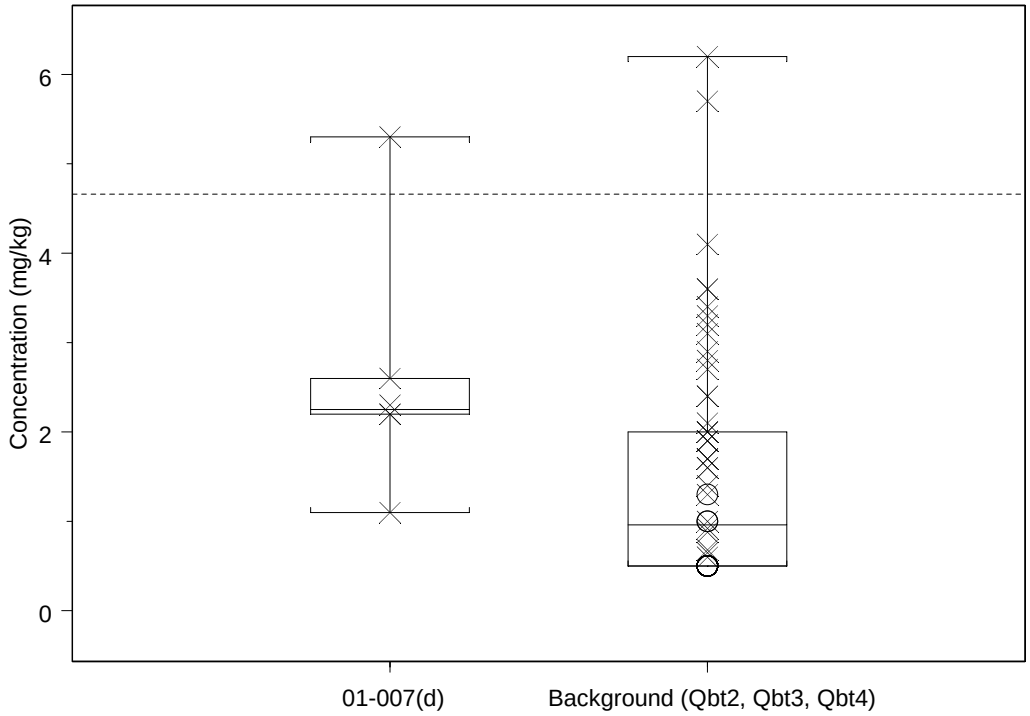


Figure F-3.29-2 Site concentrations of copper in tuff at SWMU 01-007(d) compared to background
(× = detect, ○ = nondetect)

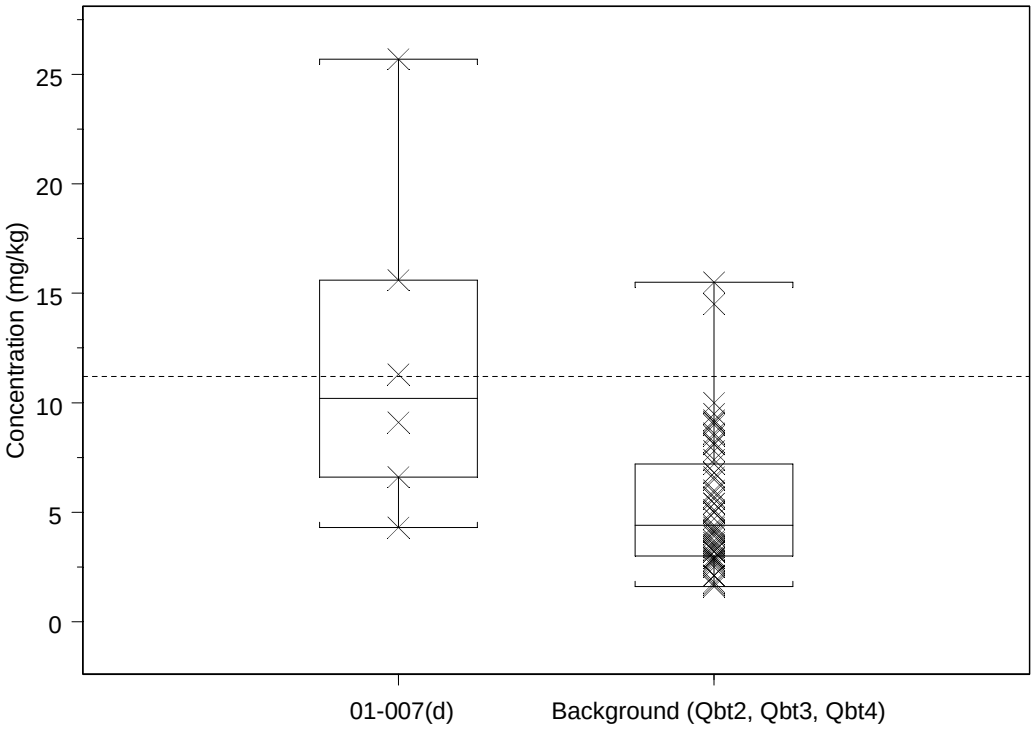


Figure F-3.29-3 Site concentrations of lead in tuff at SWMU 01-007(d) compared to background
(× = detect, ○ = nondetect)

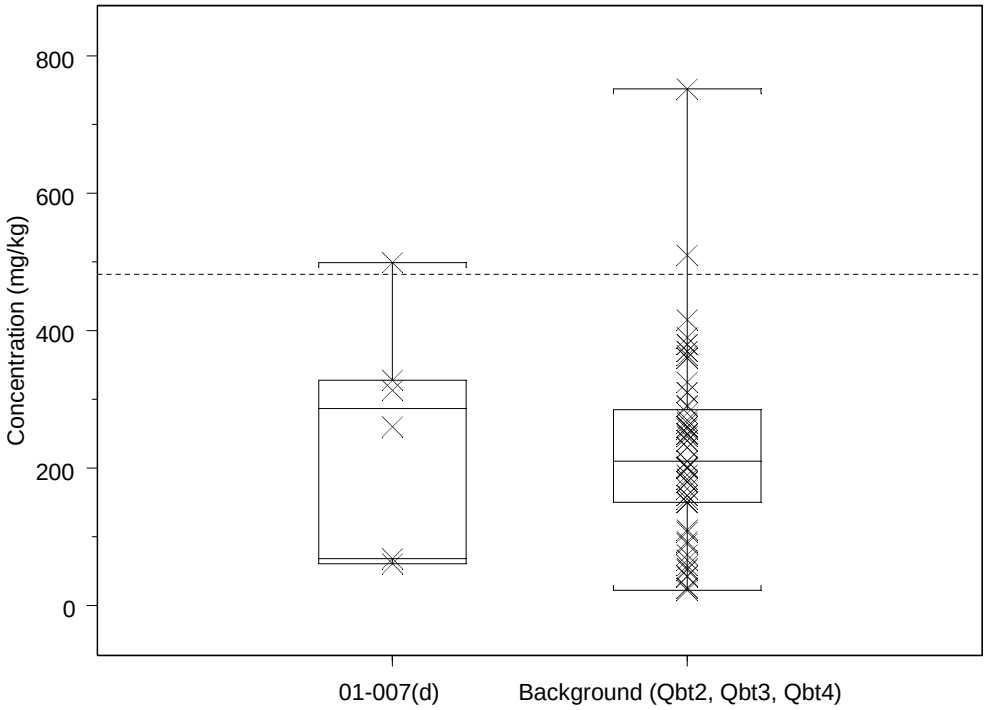


Figure F-3.29-4 Site concentrations of manganese in tuff at SWMU 01-007(d) compared to background

(× = detect, ○ = nondetect)

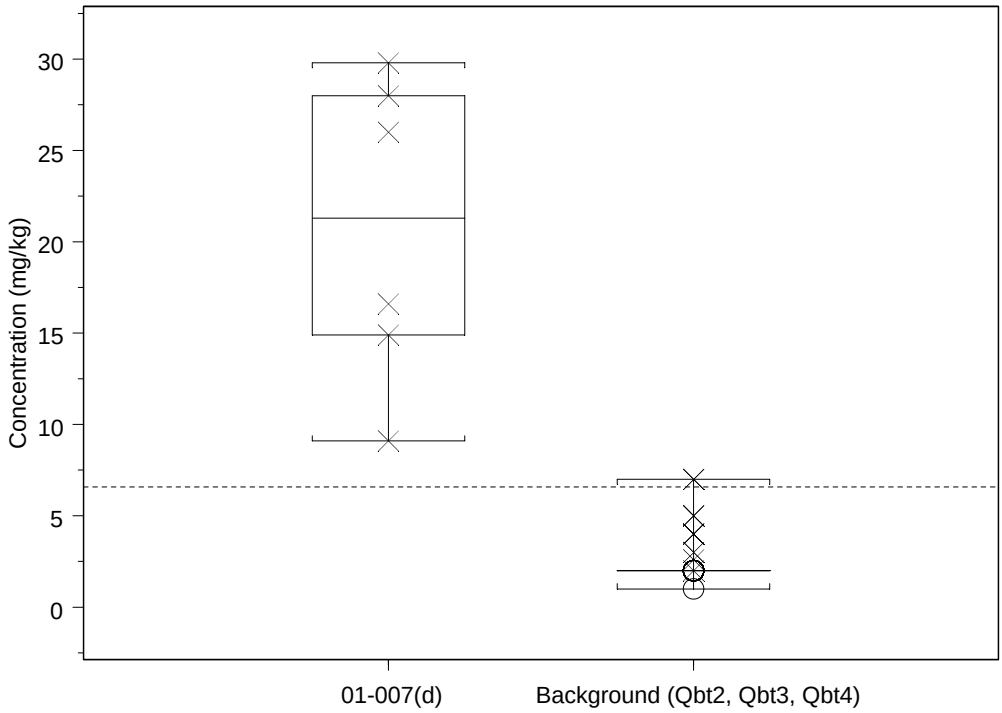


Figure F-3.29-5 Site concentrations of nickel in tuff at SWMU 01-007(d) compared to background

(× = detect, ○ = nondetect)

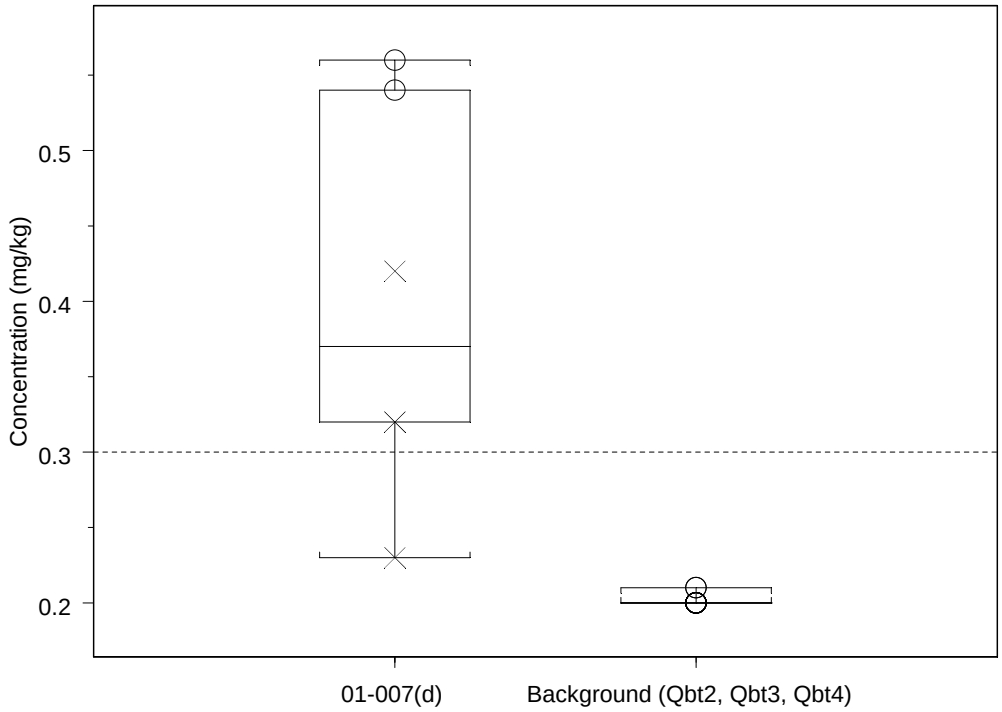


Figure F-3.29-6 Site concentrations of selenium in tuff at SWMU 01-007(d) compared to background

(× = detect, ○ = nondetect)

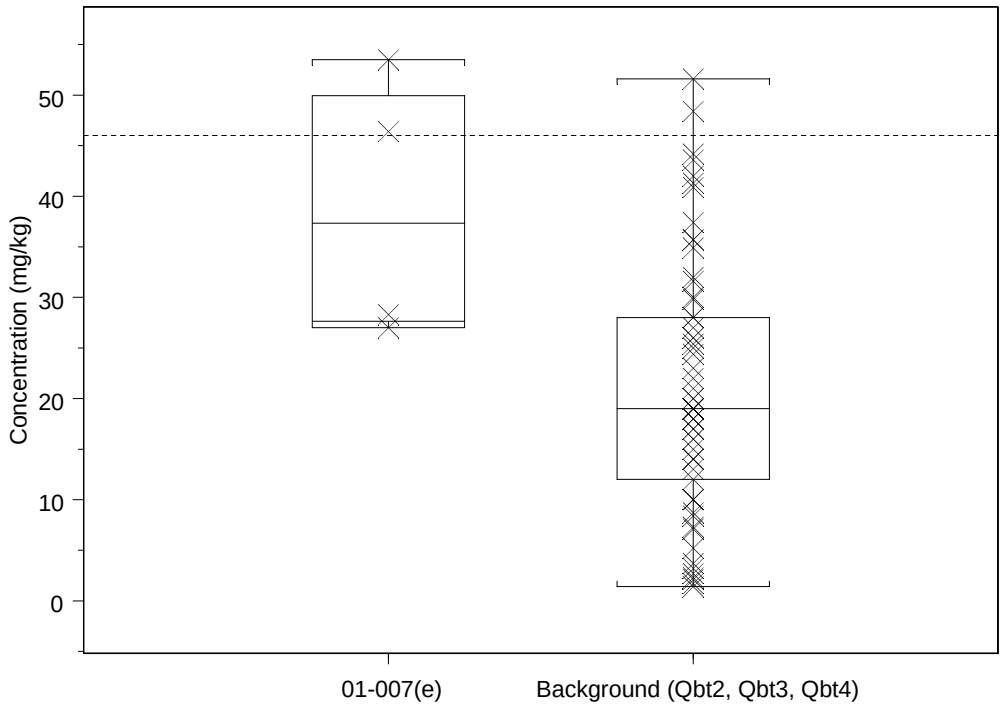


Figure F-3.30-1 Site concentrations of barium in tuff at SWMU 01-007(e) compared to background

(× = detect, ○ = nondetect)

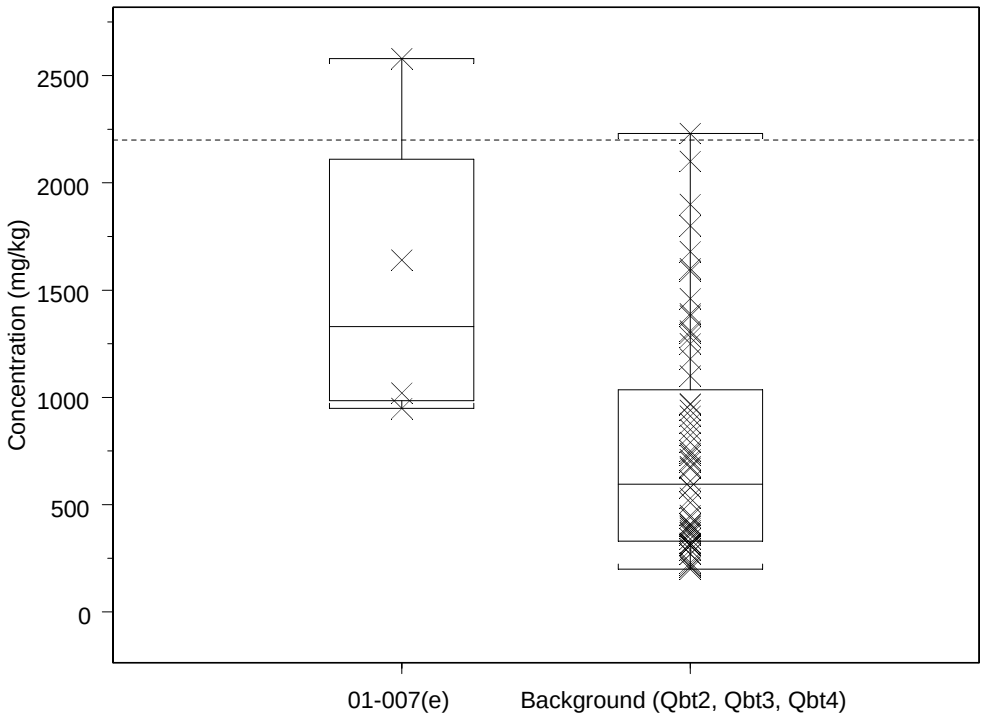


Figure F-3.30-2 Site concentrations of calcium in tuff at SWMU 01-007(e) compared to background

(× = detect, ○ = nondetect)

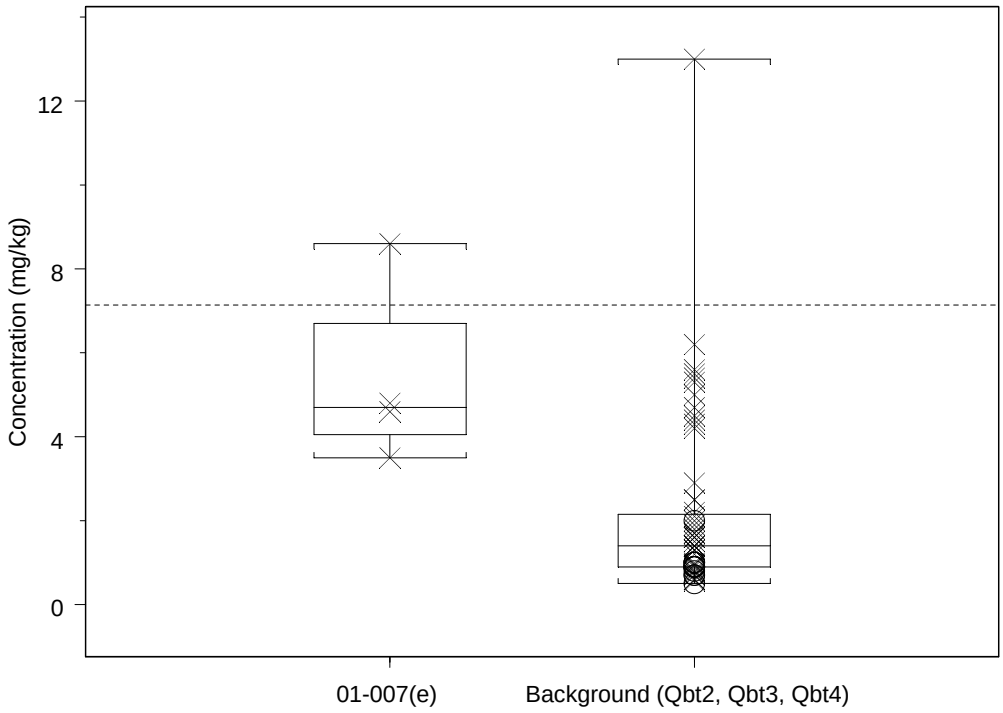


Figure F-3.30-3 Site concentrations of chromium in tuff at SWMU 01-007(e) compared to background

(× = detect, ○ = nondetect)

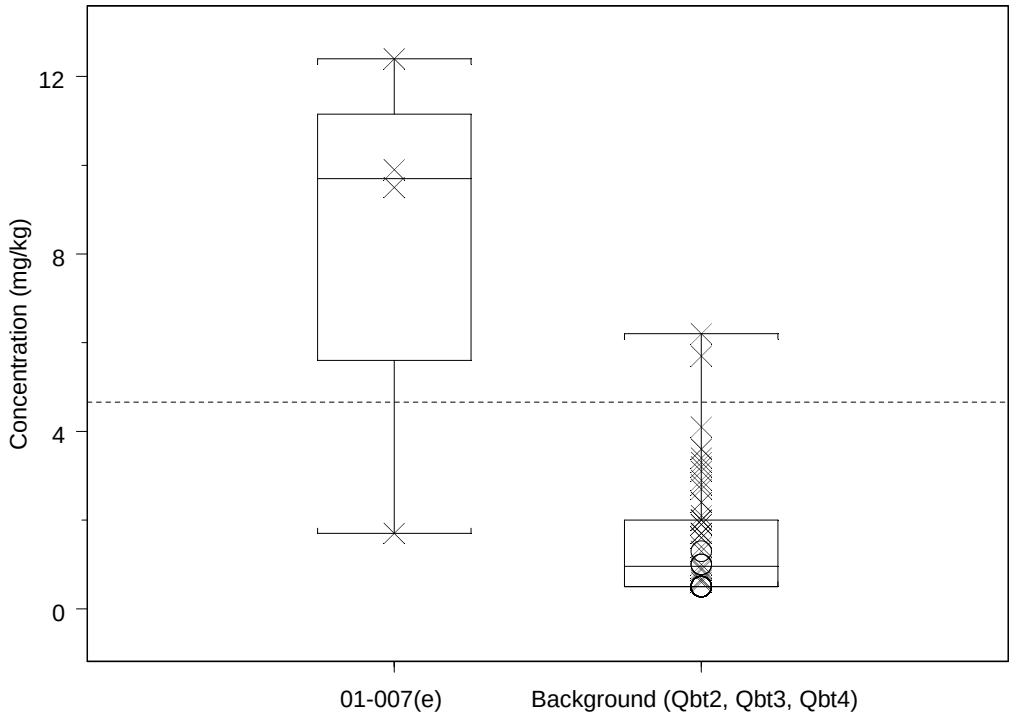


Figure F-3.30-4 Site concentrations of copper in tuff at SWMU 01-007(e) compared to background
(× = detect, ○ = nondetect)

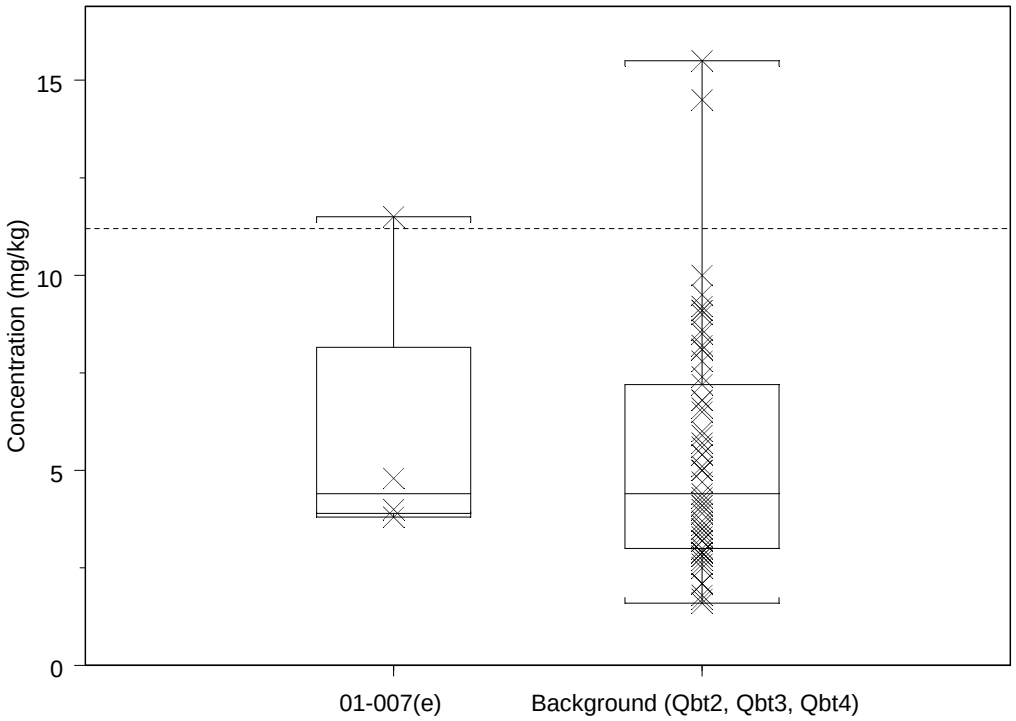


Figure F-3.30-5 Site concentrations of lead in tuff at SWMU 01-007(e) compared to background
(× = detect, ○ = nondetect)

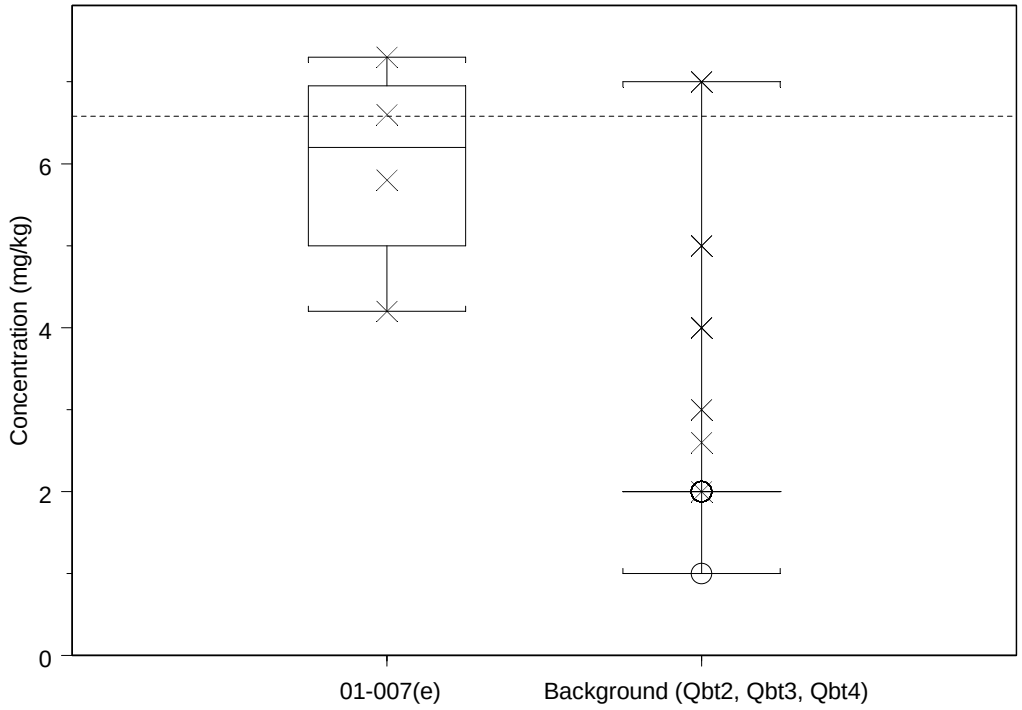


Figure F-3.30-6 Site concentrations of nickel in tuff at SWMU 01-007(e) compared to background

(× = detect, ○ = nondetect)

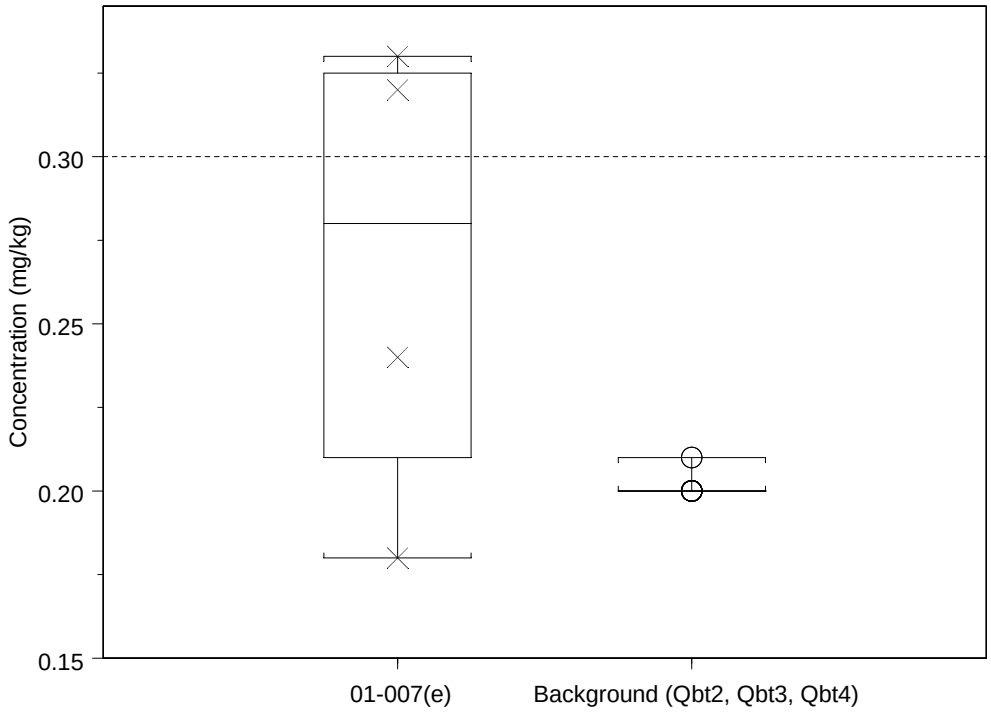


Figure F-3.30-7 Site concentrations of selenium in tuff at SWMU 01-007(e) compared to background

(× = detect, ○ = nondetect)

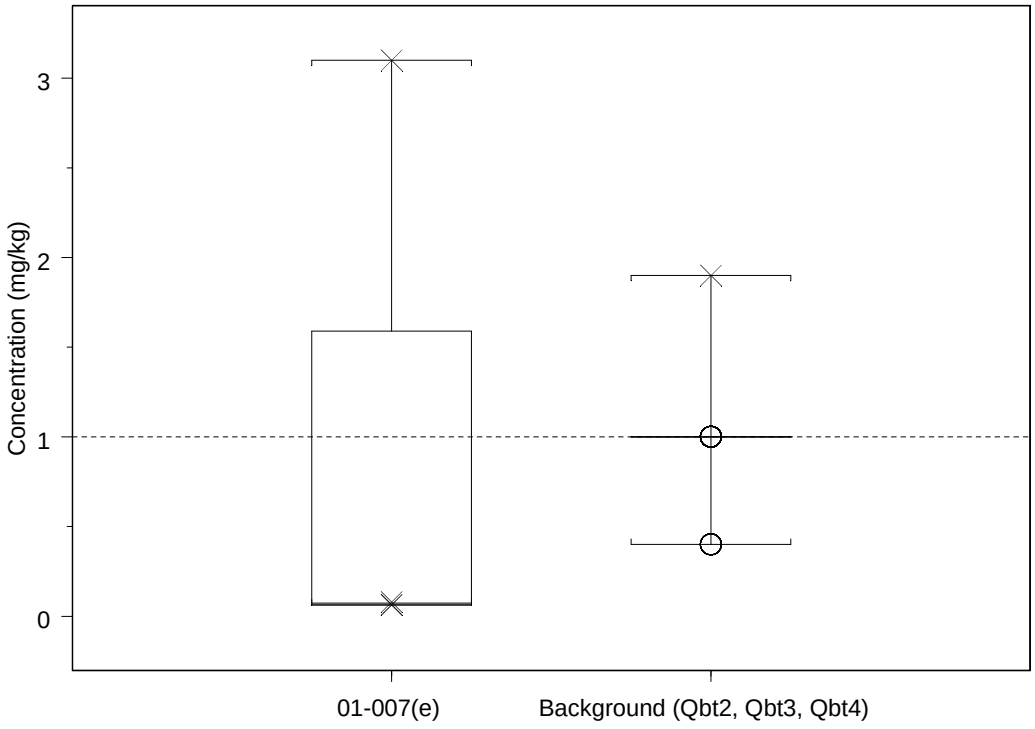


Figure F-3.30-8 Site concentrations of silver in tuff at SWMU 01-007(e) compared to background
(× = detect, ○ = nondetect)

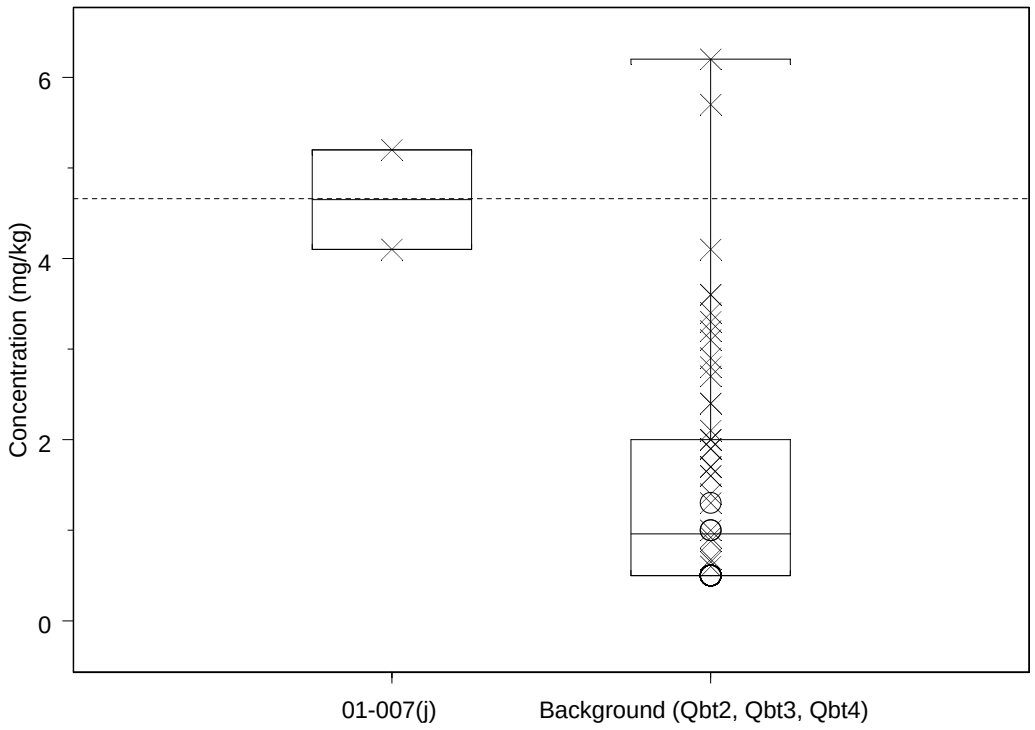


Figure F-3.31-1 Site concentrations of copper in tuff at SWMU 01-007(j) compared to background
(× = detect, ○ = nondetect)

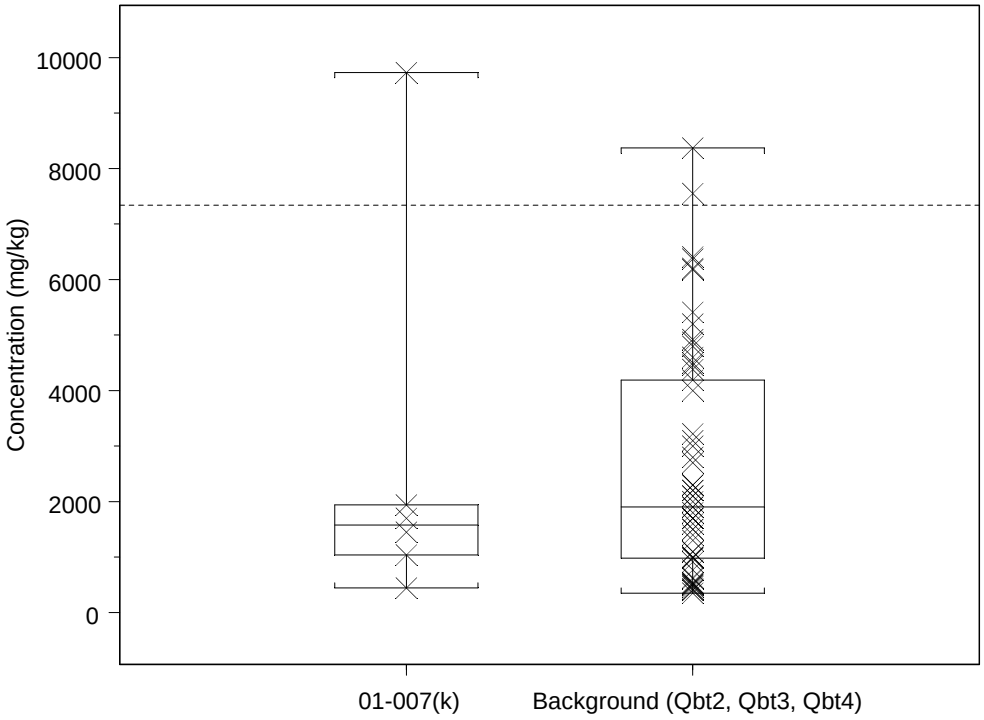


Figure F-3.32-1 Site concentrations of aluminum in tuff at AOC 01-007(k) compared to background

(× = detect, ○ = nondetect)

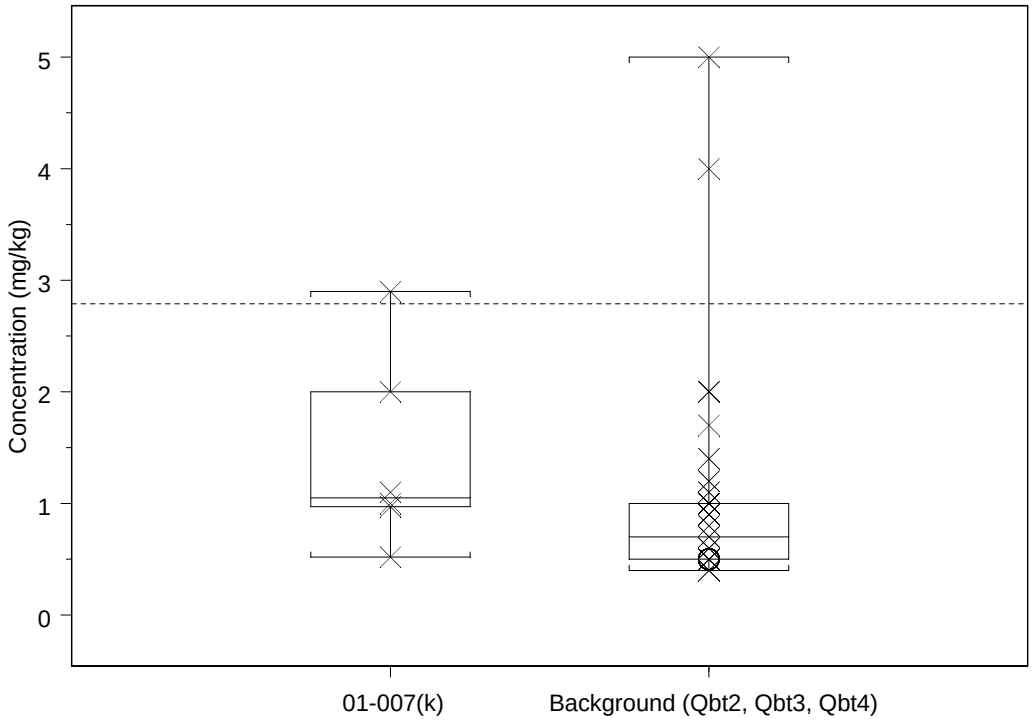


Figure F-3.32-2 Site concentrations of arsenic in tuff at AOC 01-007(k) compared to background

(× = detect, ○ = nondetect)

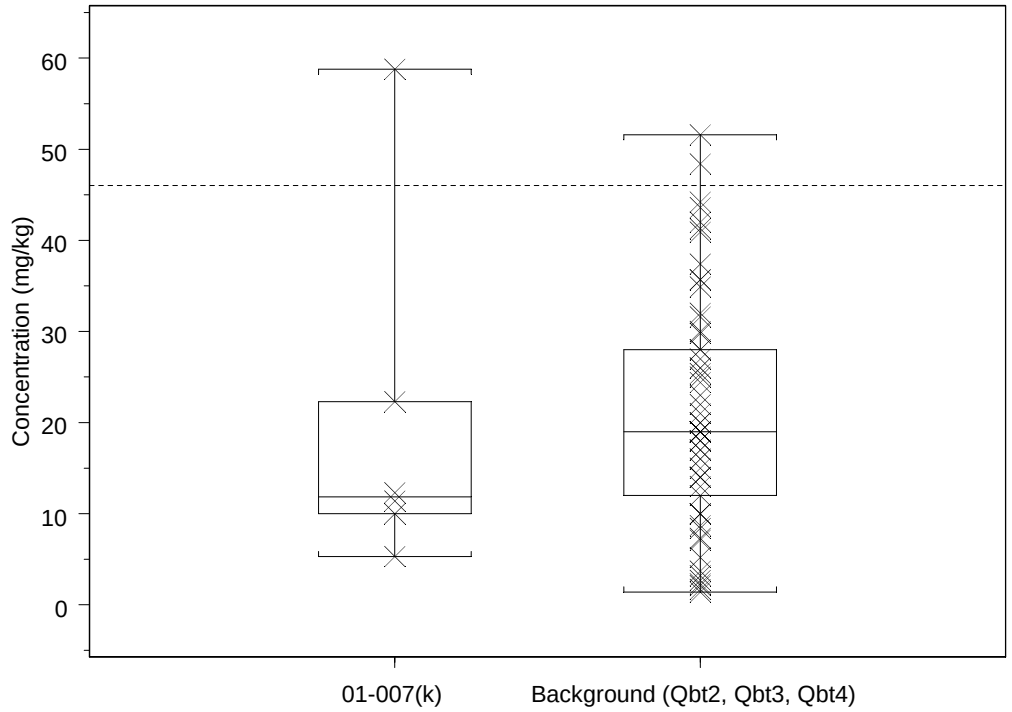


Figure F-3.32-3 Site concentrations of barium in tuff at AOC 01-007(k) compared to background
(× = detect, ○ = nondetect)

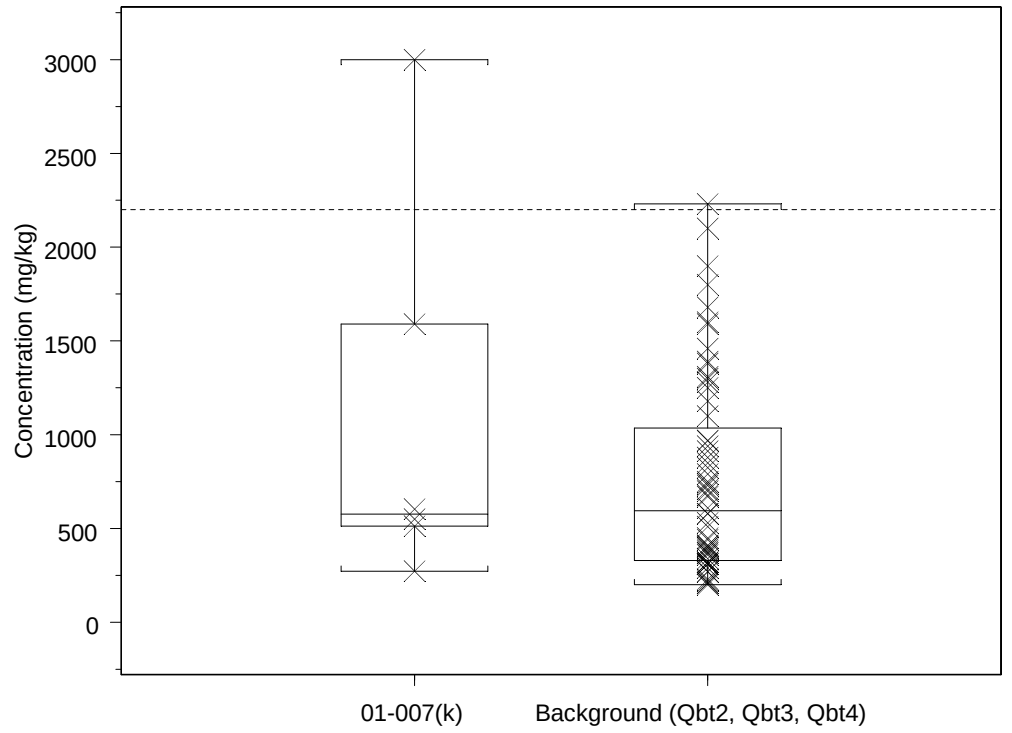


Figure F-3.32-4 Site concentrations of calcium in tuff at AOC 01-007(k) compared to background
(× = detect, ○ = nondetect)

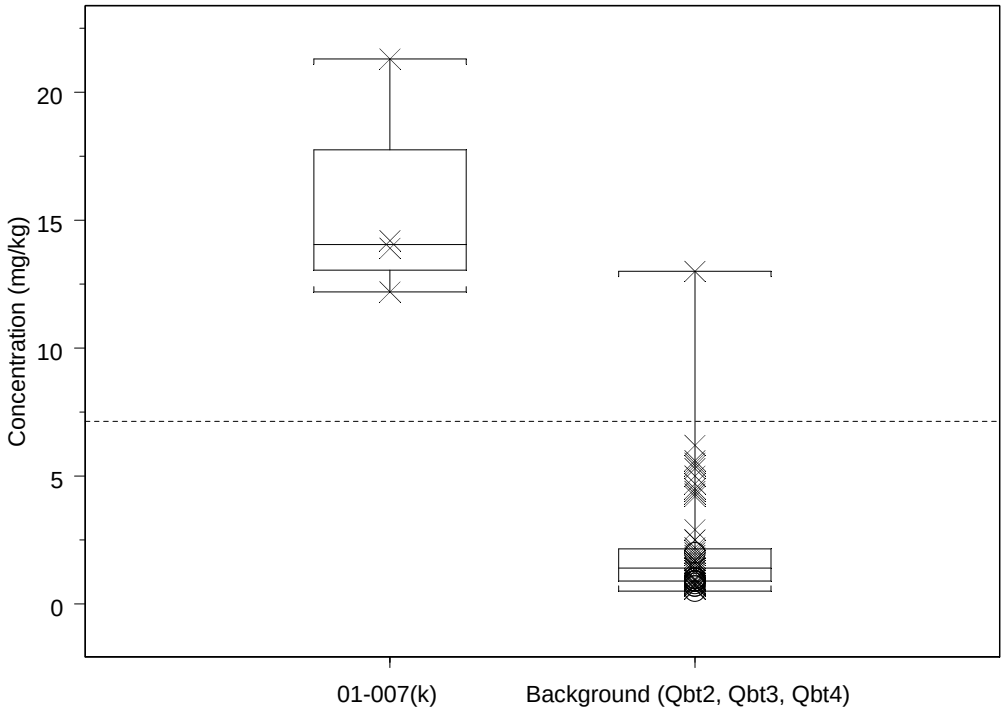


Figure F-3.32-5 Site concentrations of chromium in tuff at AOC 01-007(k) compared to background

(× = detect, ○ = nondetect)

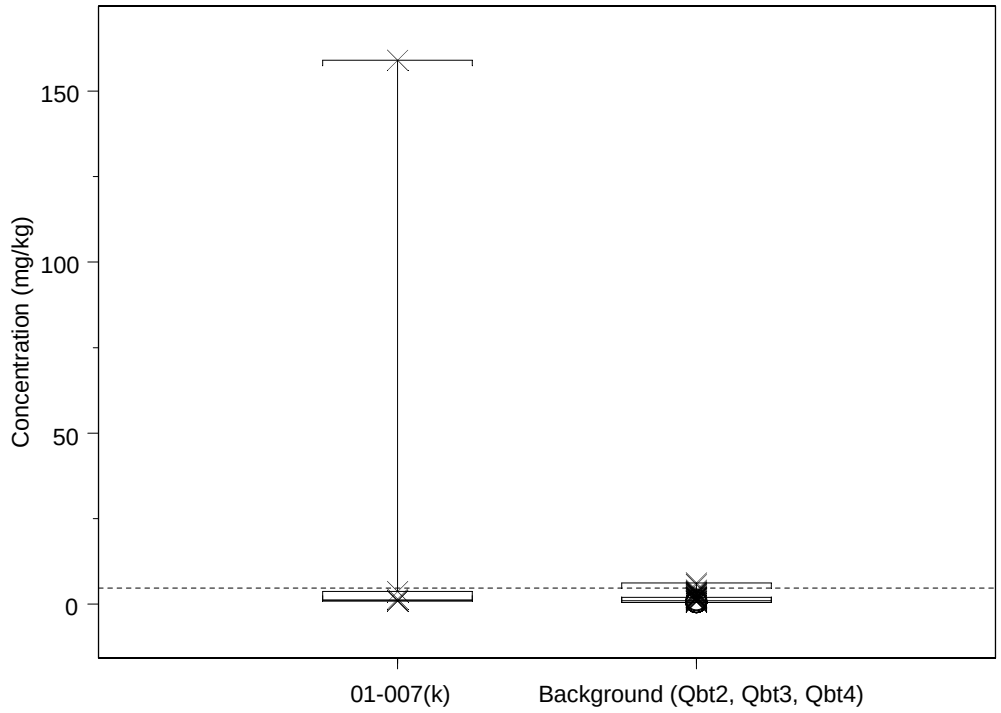


Figure F-3.32-6 Site concentrations of copper in tuff at AOC 01-007(k) compared to background

(× = detect, ○ = nondetect)

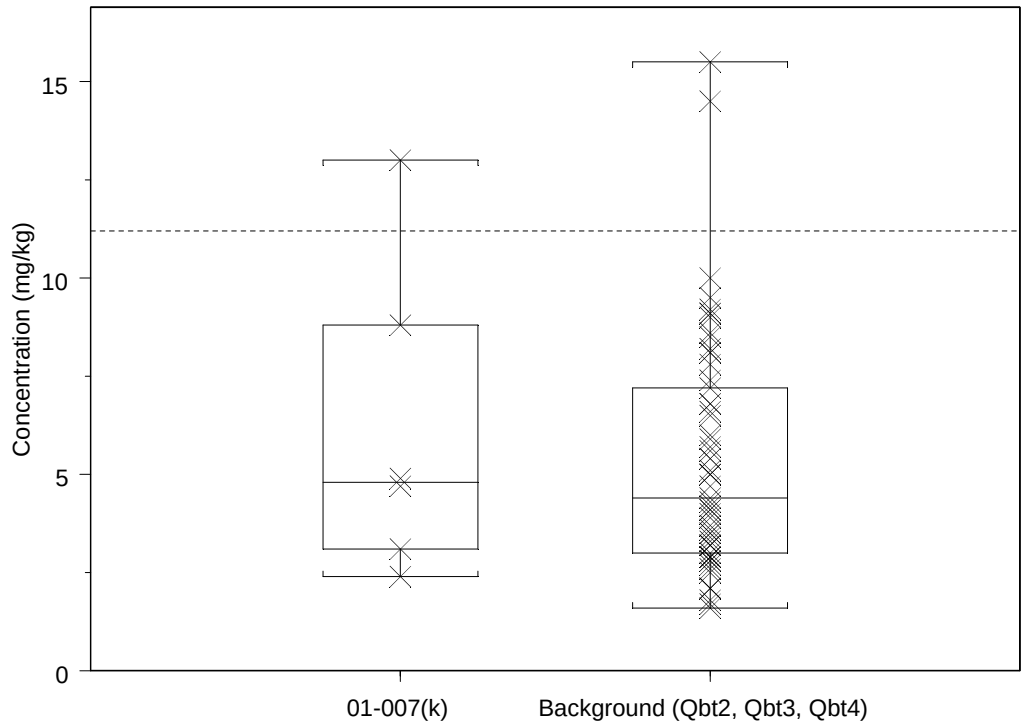


Figure F-3.32-7 Site concentrations of lead in tuff at AOC 01-007(k) compared to background
(× = detect, ○ = nondetect)

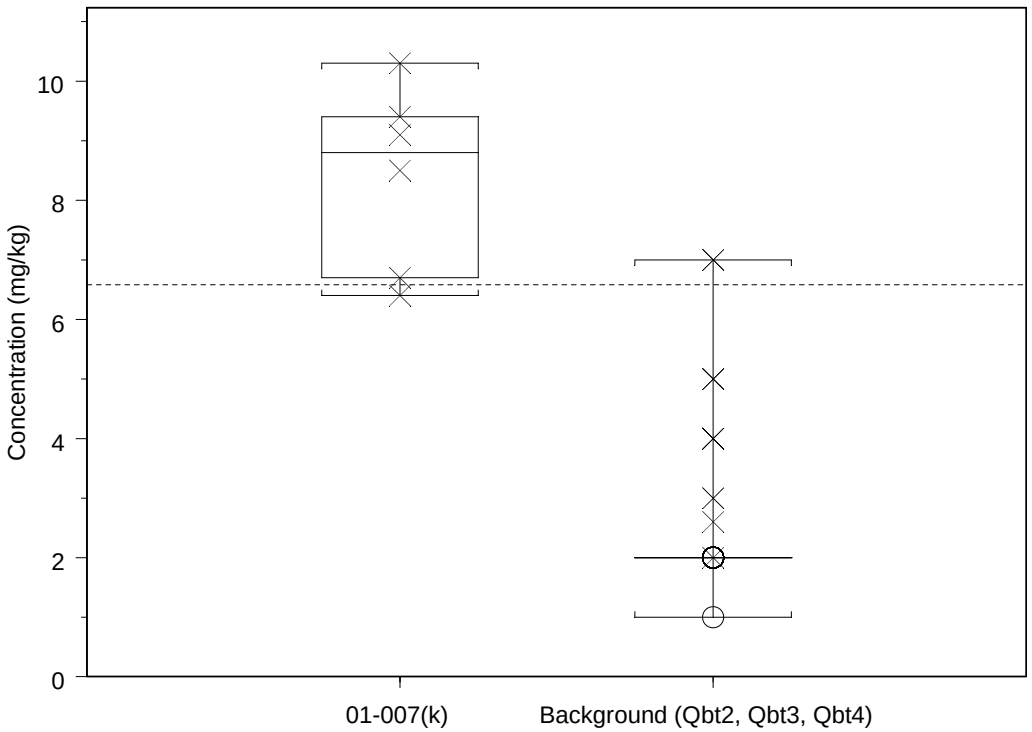


Figure F-3.32-8 Site concentrations of nickel in tuff at AOC 01-007(k) compared to background
(× = detect, ○ = nondetect)

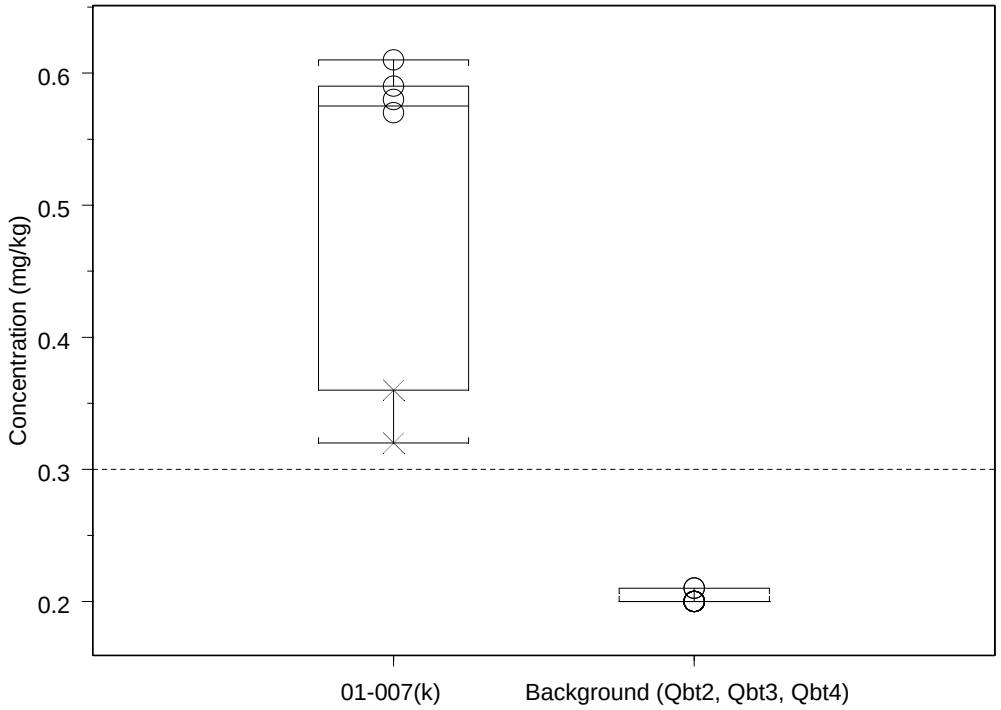


Figure F-3.32-9 Site concentrations of selenium in tuff at AOC 01-007(k) compared to background

(× = detect, ○ = nondetect)

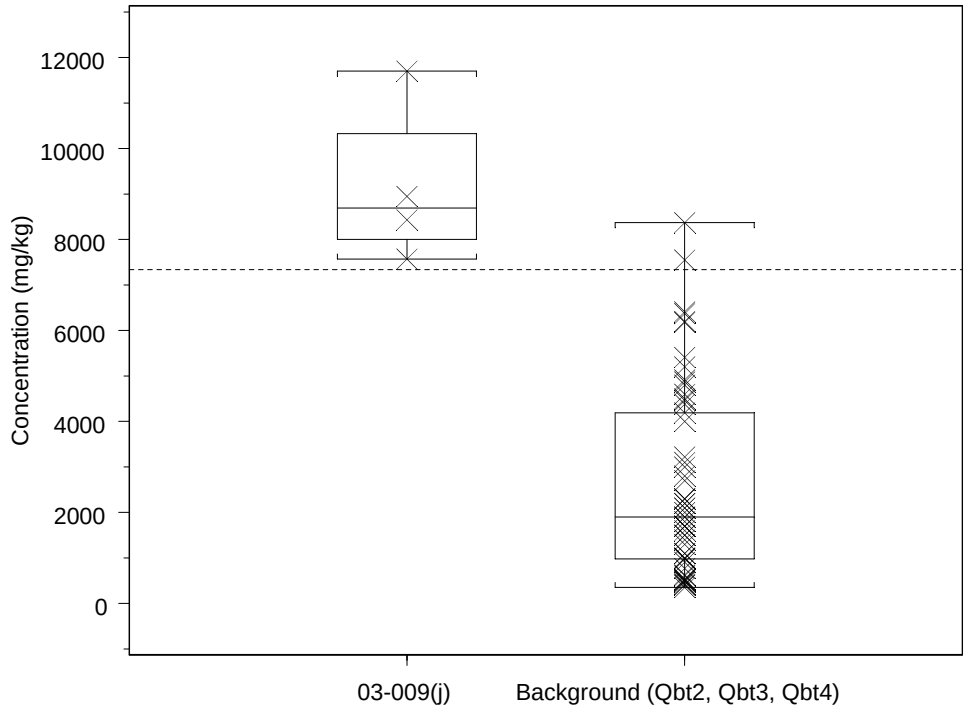


Figure F-4.1-1 Site concentrations of aluminum in tuff at SWMU 03-009(j) compared to background

(× = detect, ○ = nondetect)

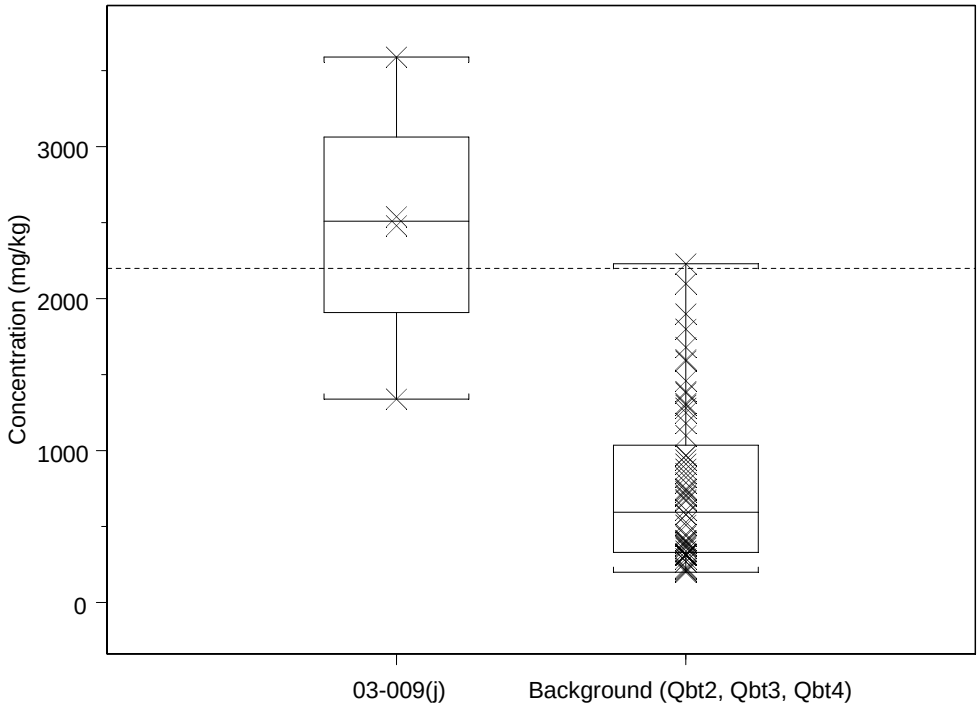


Figure F-4.1-2 Site concentrations of calcium in tuff at SWMU 03-009(j) compared to background
(× = detect, ○ = nondetect)

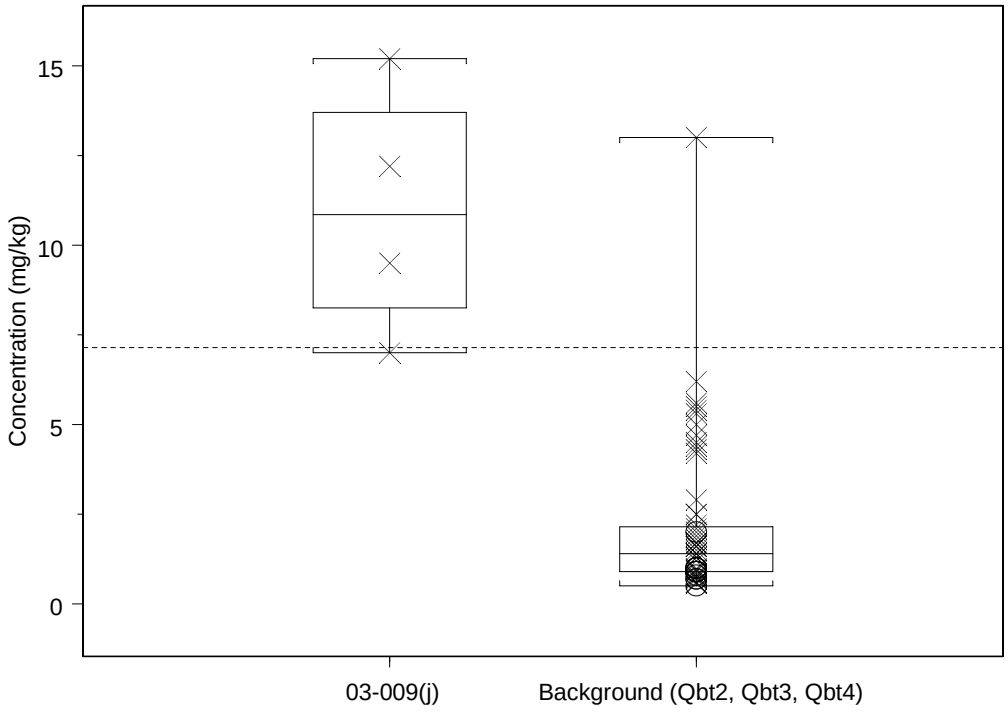


Figure F-4.1-3 Site concentrations of chromium in tuff at SWMU 03-009(j) compared to background
(× = detect, ○ = nondetect)

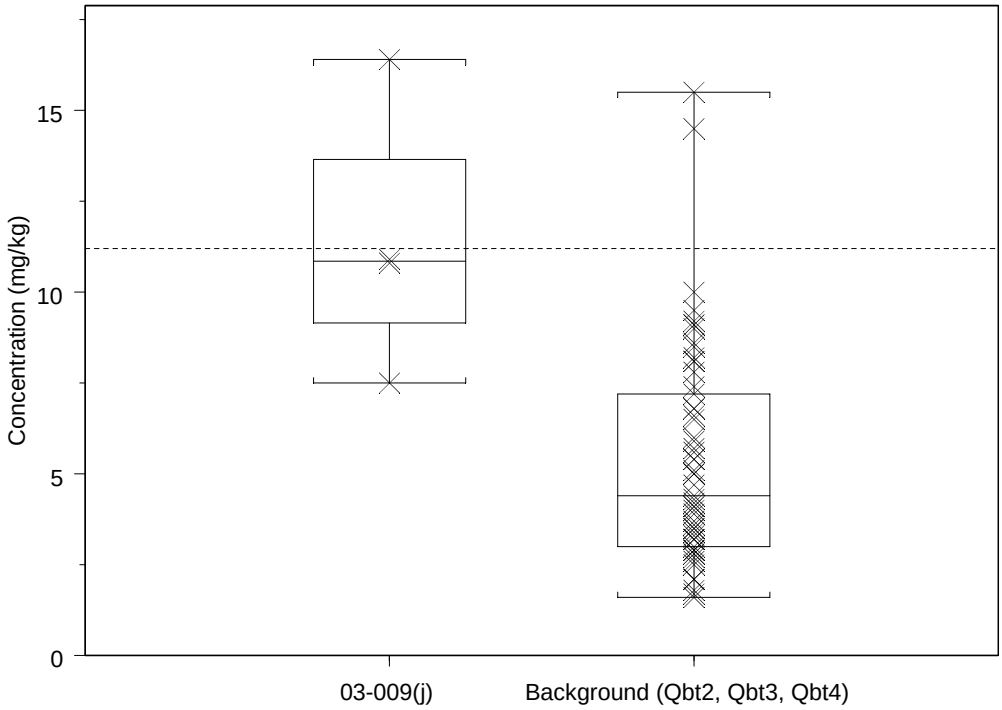


Figure F-4.1-4 Site concentrations of lead in tuff at SWMU 03-009(j) compared to background

(× = detect, ○ = nondetect)

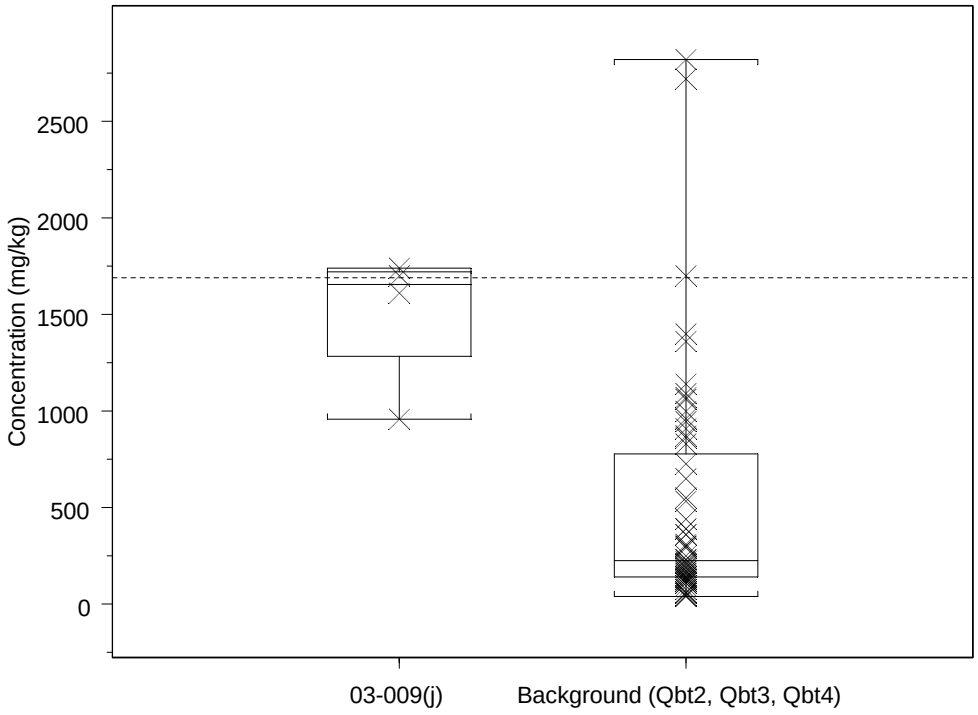


Figure F-4.1-5 Site concentrations of magnesium in tuff at SWMU 03-009(j) compared to background

(× = detect, ○ = nondetect)

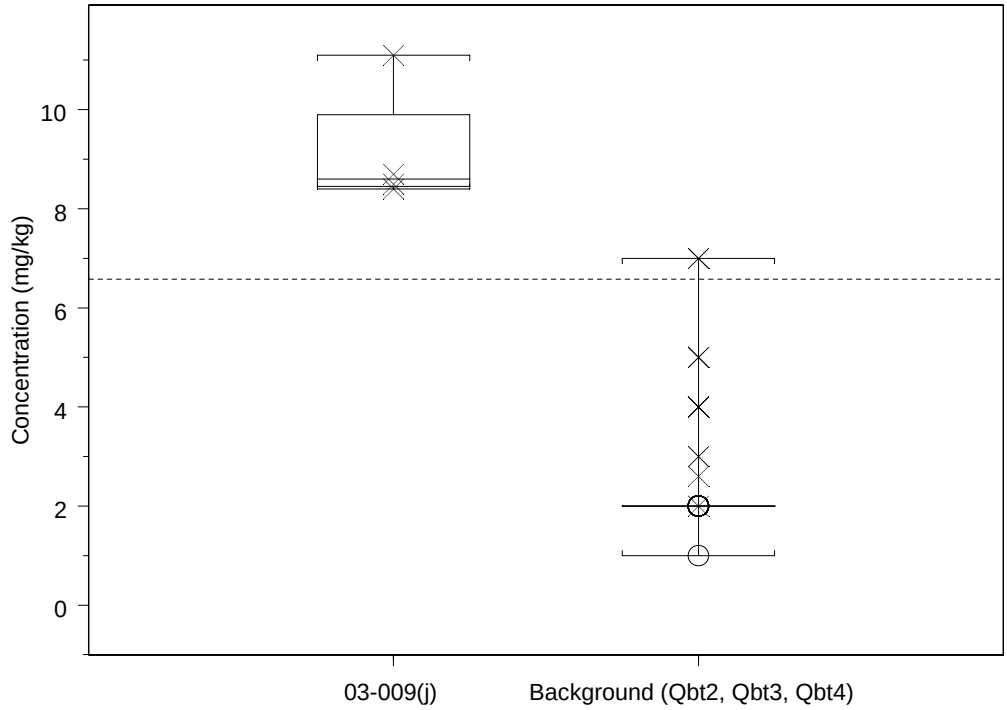


Figure F-4.1-6 Site concentrations of nickel in tuff at SWMU 03-009(j) compared to background
(× = detect, ○ = nondetect)

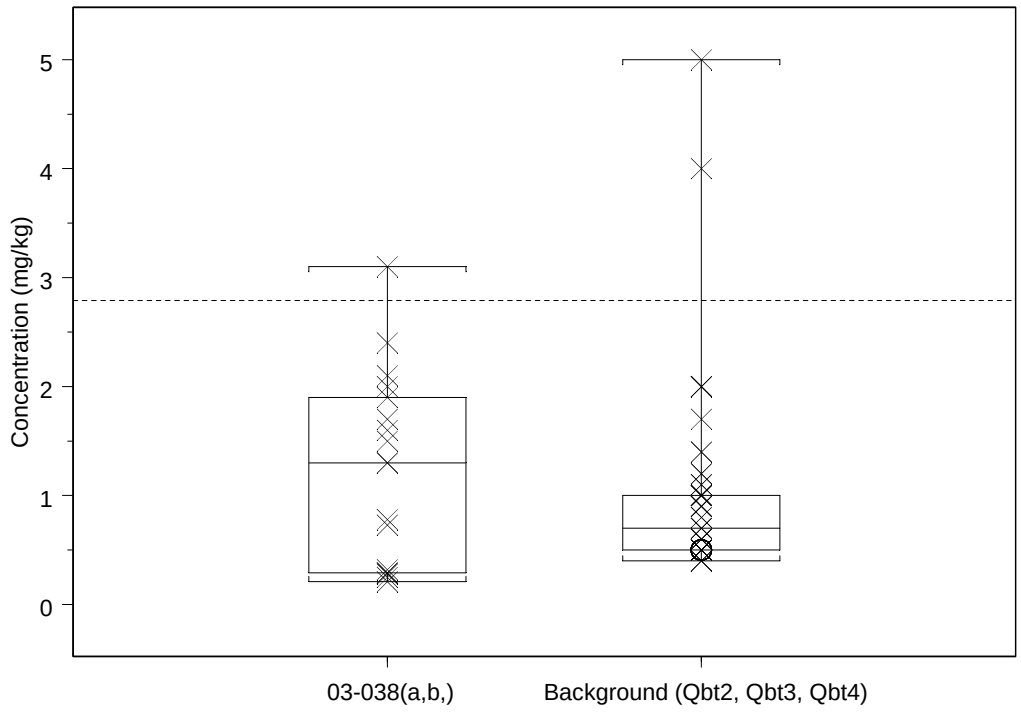


Figure F-4.2-1 Site concentrations of arsenic in tuff at SWMUs 03-038(a) and 03-038(b) compared to background
(× = detect, ○ = nondetect)

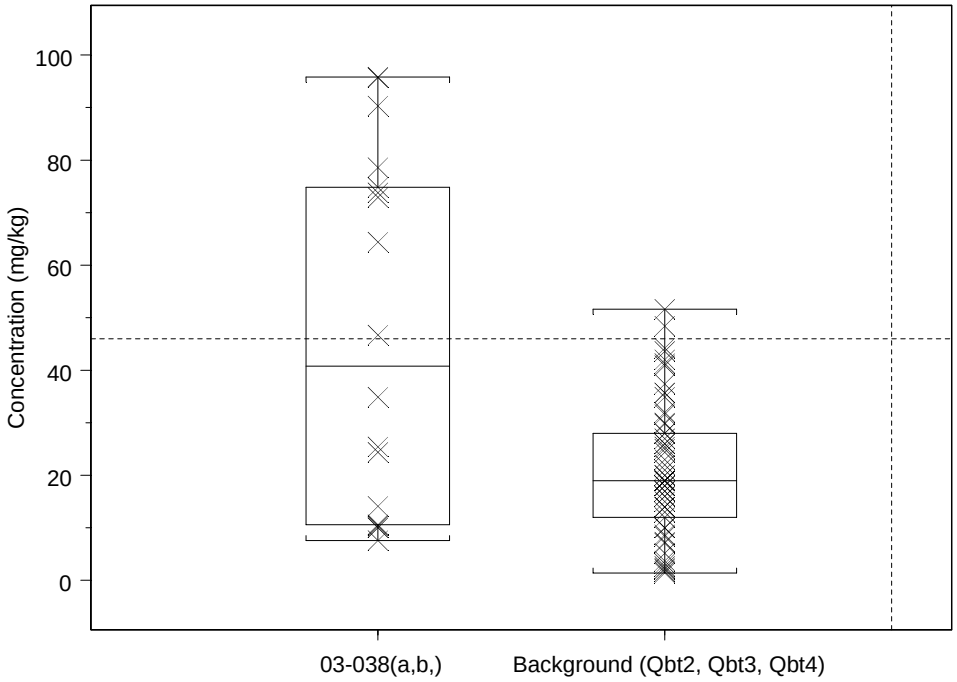


Figure F-4.2-2 Site concentrations of barium in tuff at SWMUs 03-038(a) and 03-038(b) compared to background

(× = detect, ○ = nondetect)

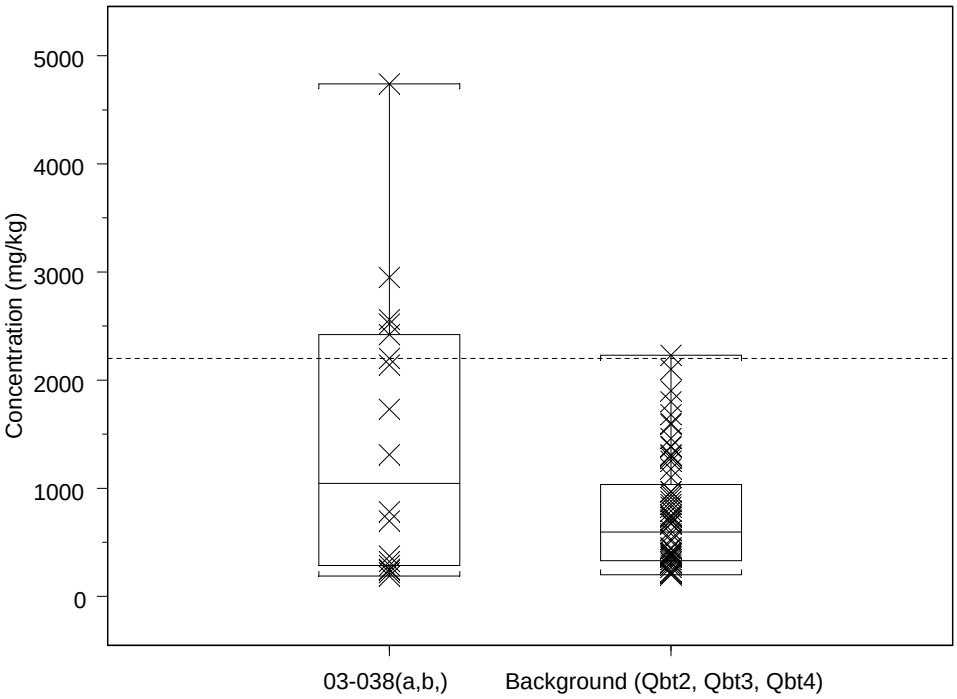


Figure F-4.2-3 Site concentrations of calcium in tuff at SWMUs 03-038(a) and 03-038(b) compared to background

(× = detect, ○ = nondetect)

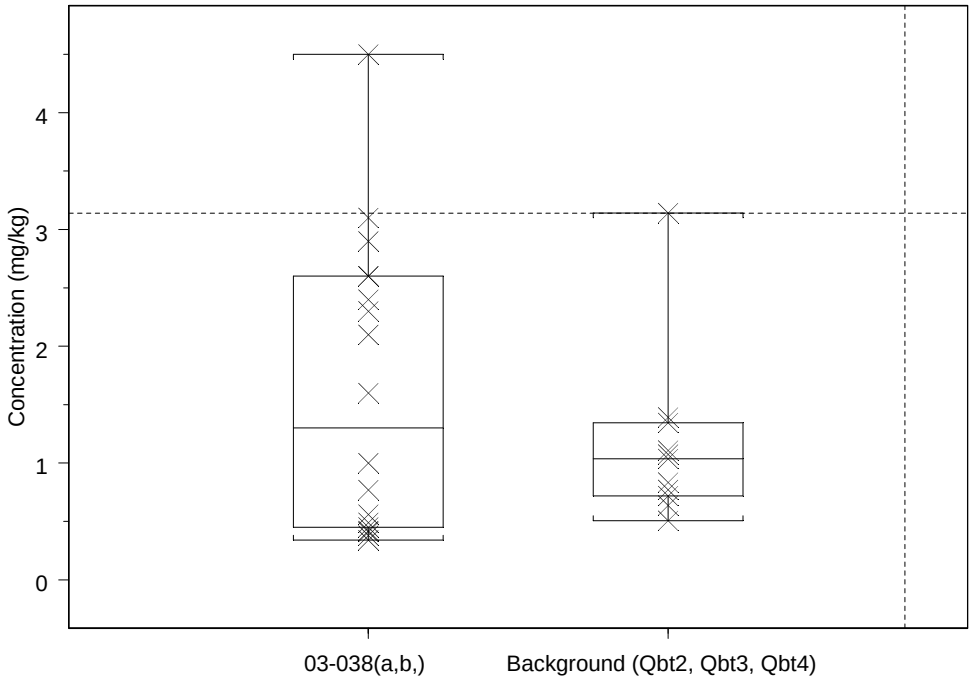


Figure F-4.2-4 Site concentrations of cobalt in tuff at SWMUs 03-038(a) and 03-038(b) compared to background

(× = detect, ○ = nondetect)

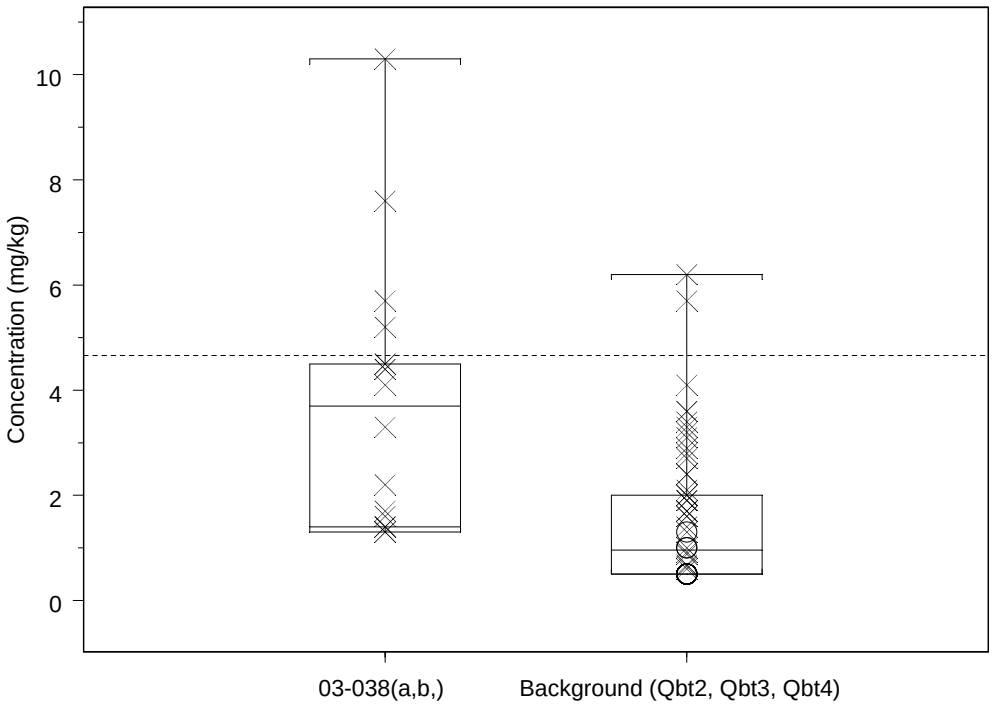


Figure F-4.2-5 Site concentrations of copper in tuff at SWMUs 03-038(a) and 03-038(b) compared to background

(× = detect, ○ = nondetect)

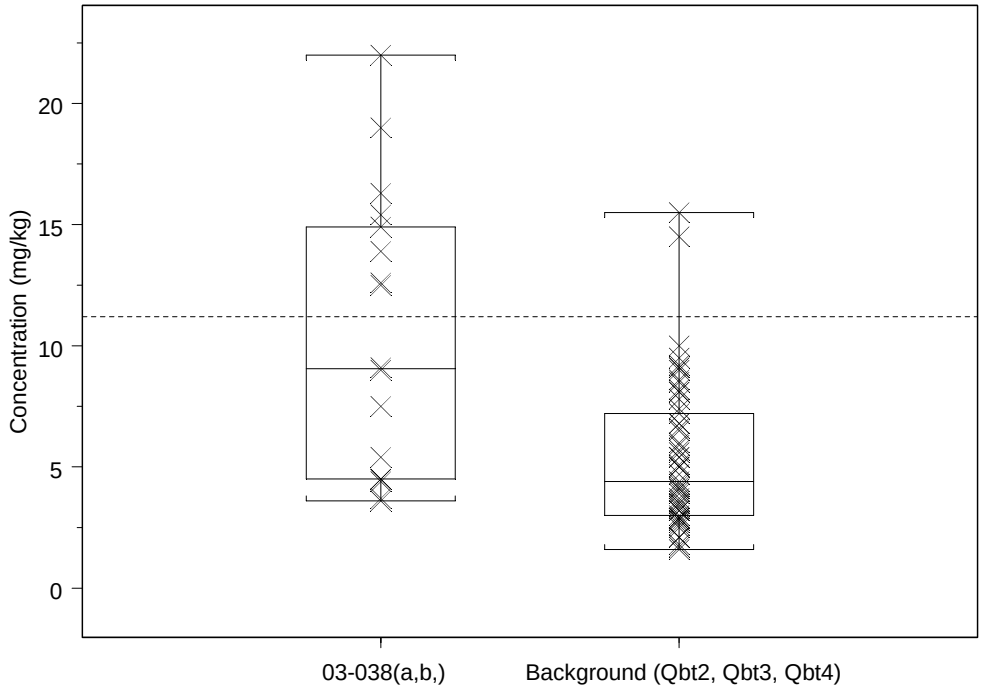


Figure F-4.2-6 Site concentrations of lead in tuff at SWMUs 03-038(a) and 03-038(b) compared to background

(× = detect, ○ = nondetect)

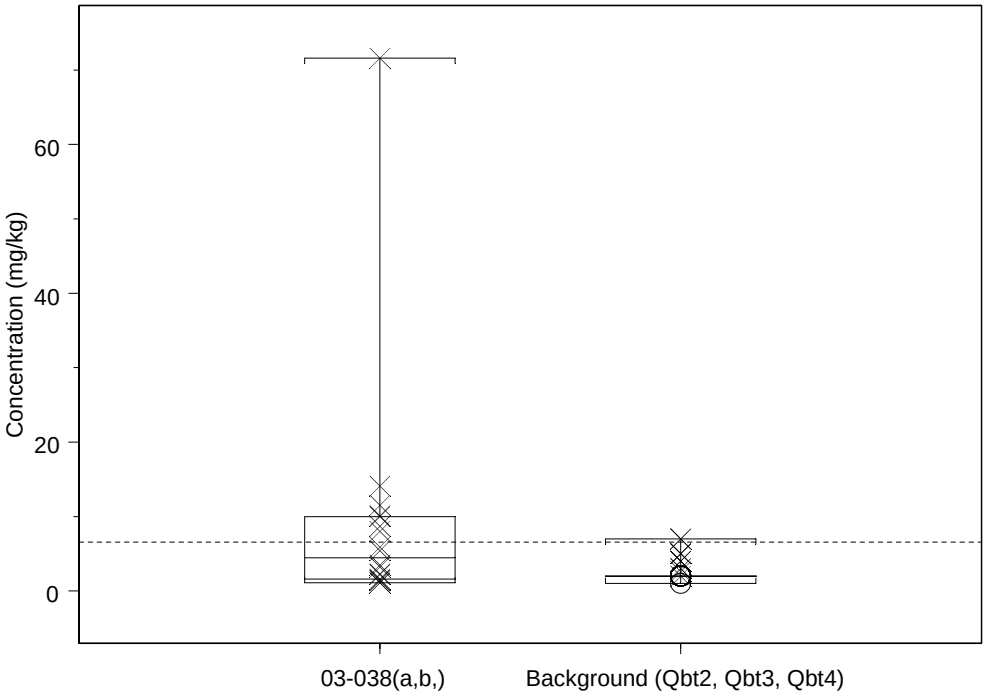


Figure F-4.2-7 Site concentrations of nickel in tuff at SWMUs 03-038(a) and 03-038(b) compared to background

(× = detect, ○ = nondetect)

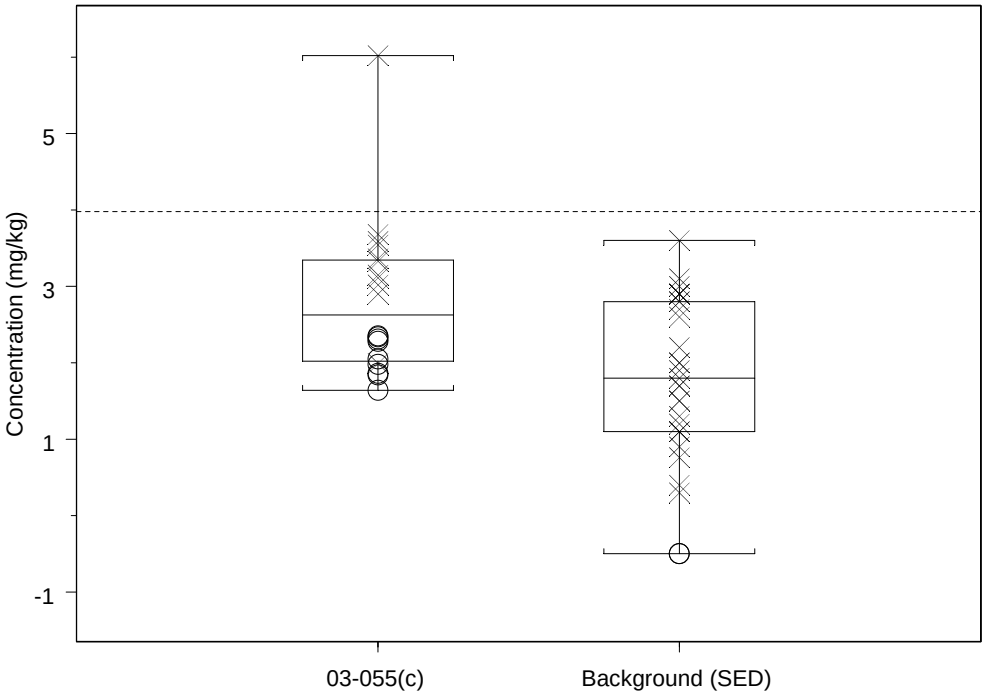


Figure F-4.3-1 Site concentrations of arsenic in sediment at SWMU 03-055(c) compared to background

(× = detect, ○ = nondetect)

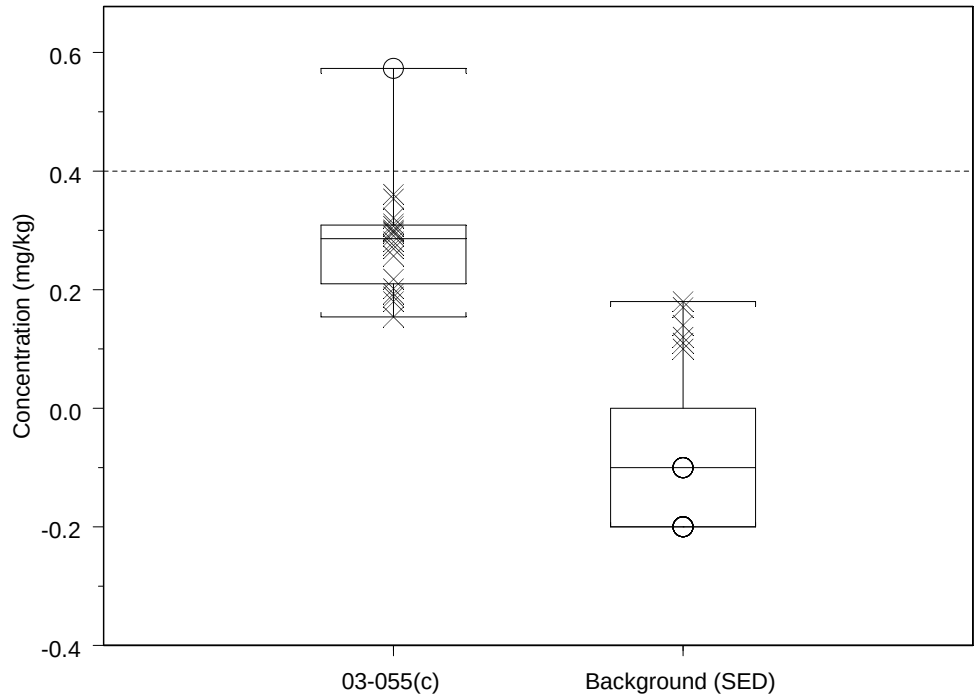


Figure F-4.3-2 Site concentrations of cadmium in sediment at SWMU 03-055(c) compared to background

(× = detect, ○ = nondetect)

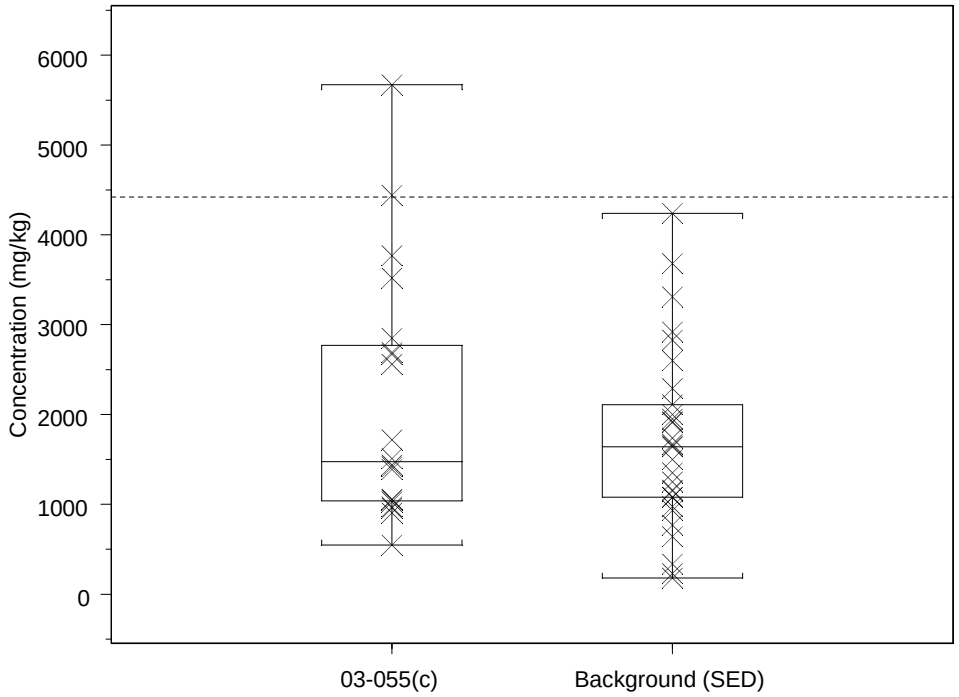


Figure F-4.3-3 Site concentrations of calcium in sediment at SWMU 03-055(c) compared to background

(× = detect, ○ = nondetect)

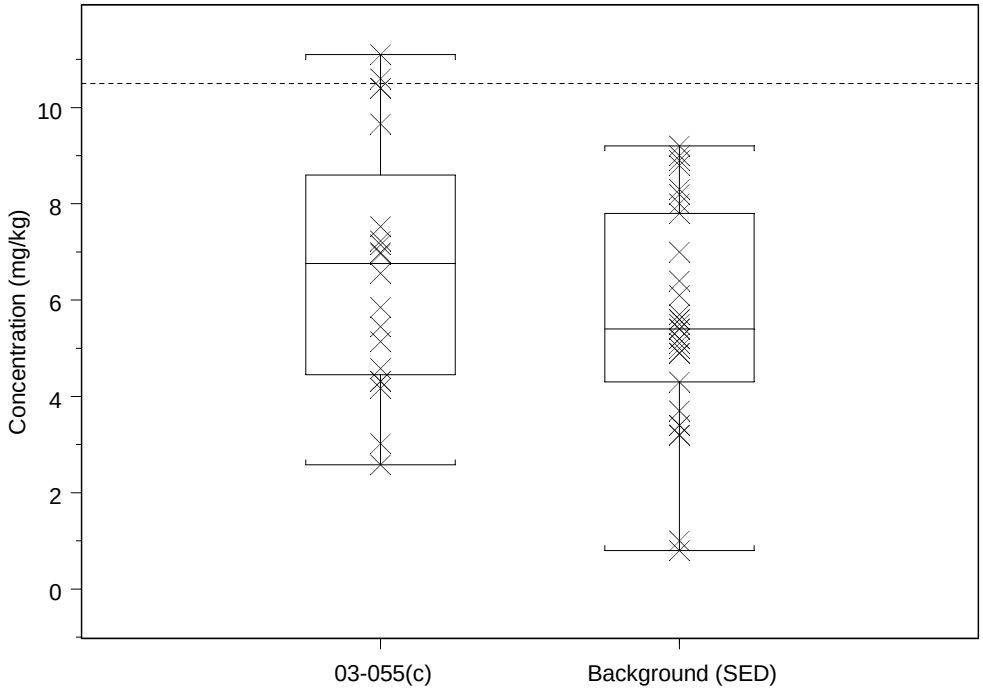


Figure F-4.3-4 Site concentrations of chromium in sediment at SWMU 03-055(c) compared to background

(× = detect, ○ = nondetect)

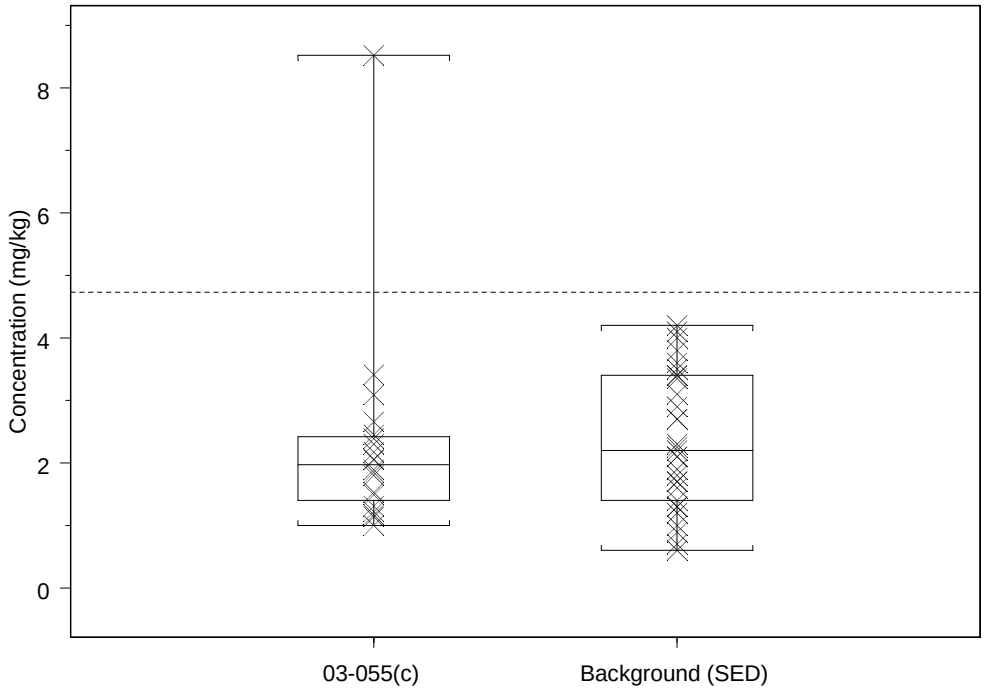


Figure F-4.3-5 Site concentrations of cobalt in sediment at SWMU 03-055(c) compared to background

(× = detect, ○ = nondetect)

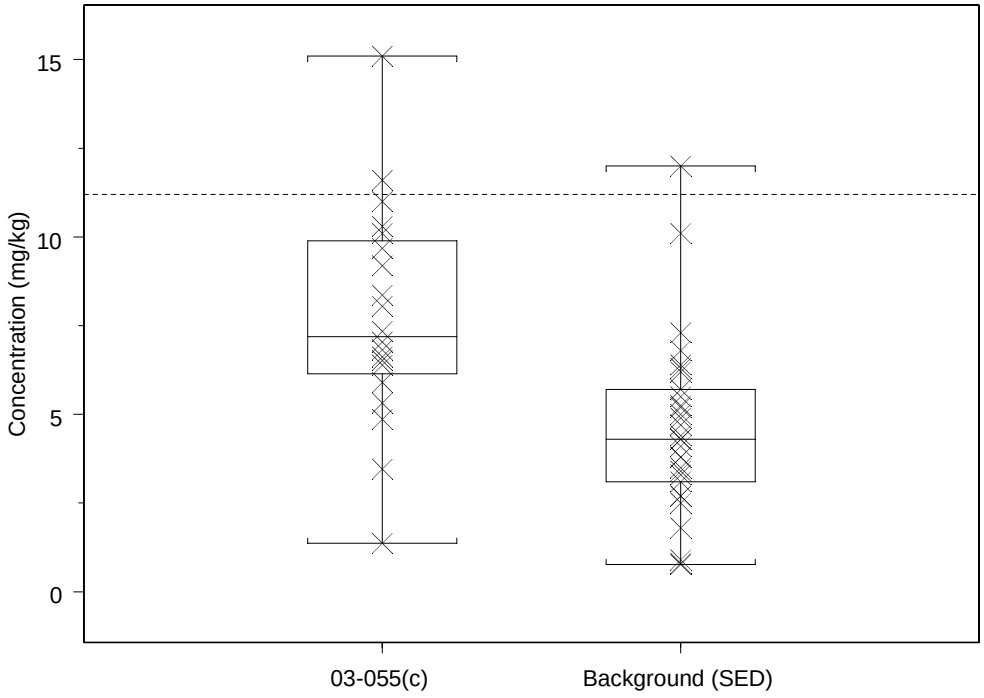


Figure F-4.3-6 Site concentrations of copper in sediment at SWMU 03-055(c) compared to background

(× = detect, ○ = nondetect)

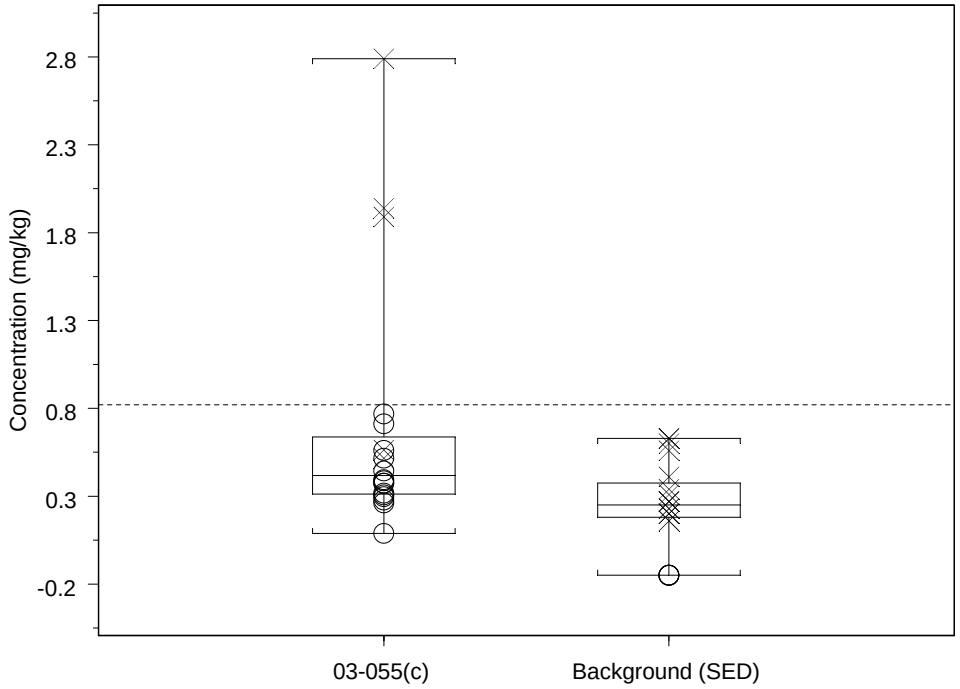


Figure F-4.3-7 Site concentrations of total cyanide in sediment at SWMU 03-055(c) compared to background

(× = detect, ○ = nondetect)

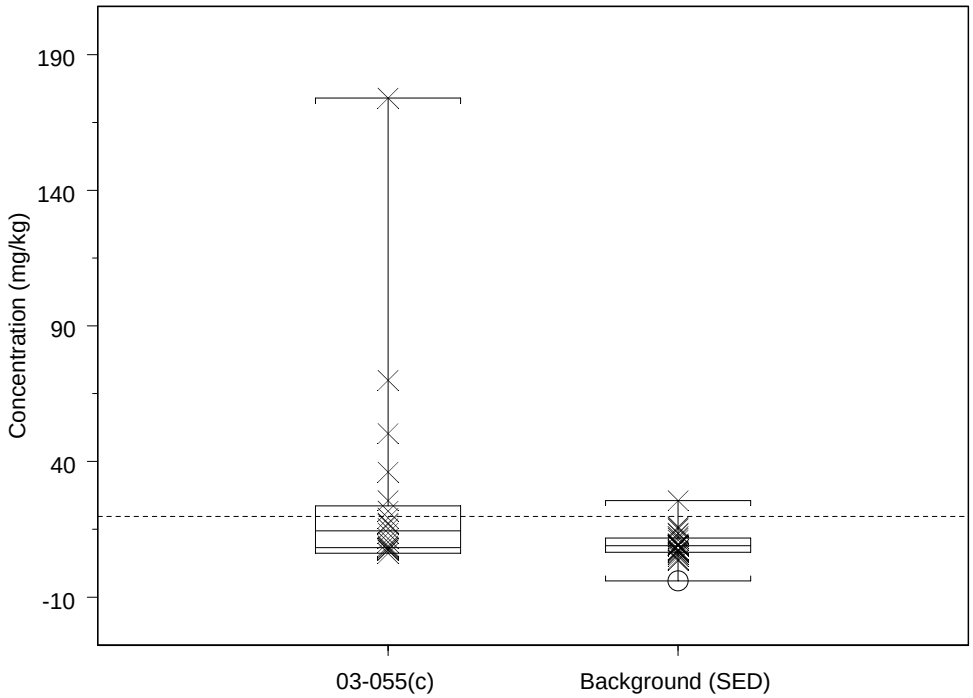


Figure F-4.3-8 Site concentrations of lead in sediment at SWMU 03-055(c) compared to background

(× = detect, ○ = nondetect)

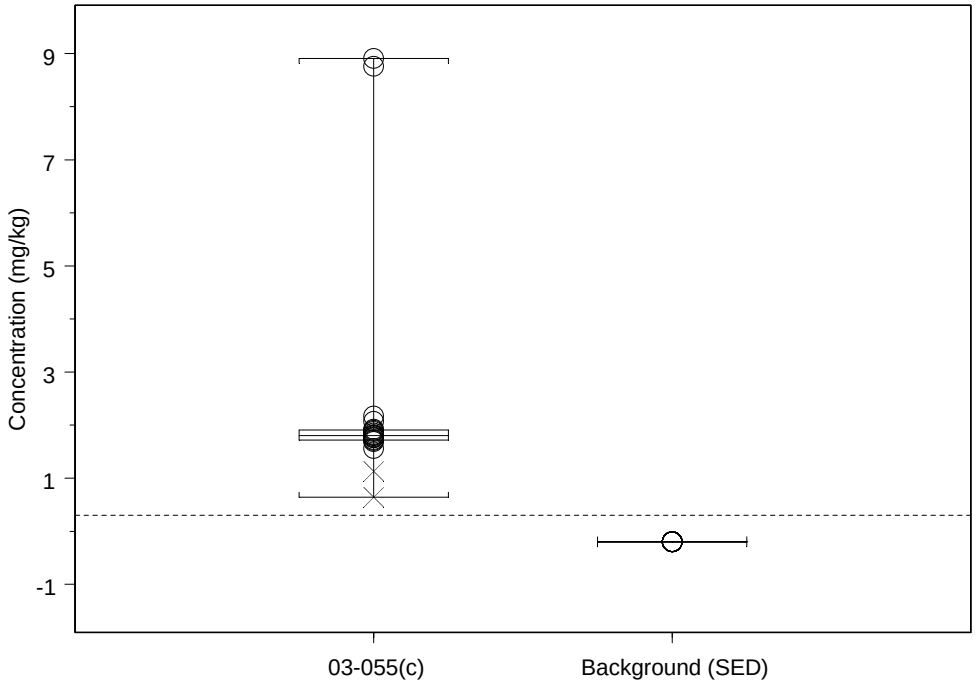


Figure F-4.3-9 Site concentrations of selenium in sediment at SWMU 03-055(c) compared to background

(× = detect, ○ = nondetect)

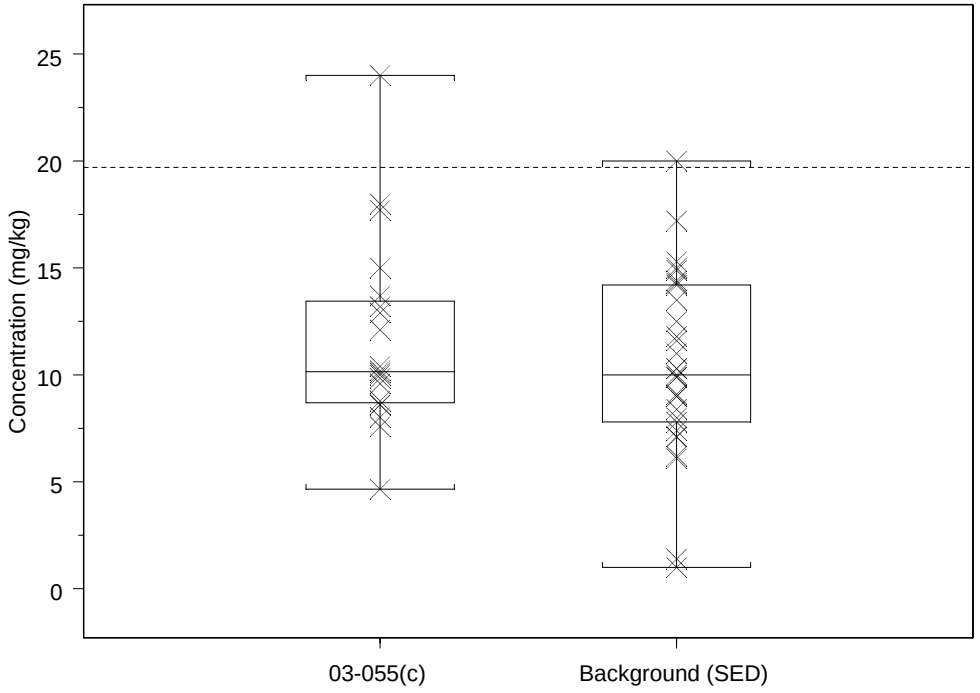


Figure F-4.3-10 Site concentrations of vanadium in sediment at SWMU 03-055(c) compared to background

(× = detect, ○ = nondetect)

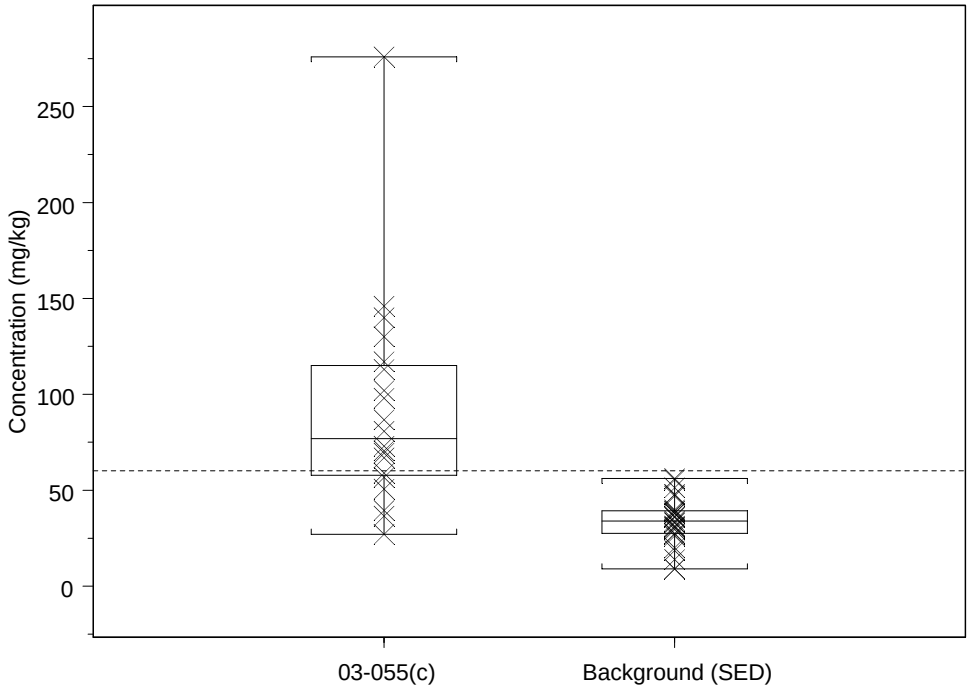


Figure F-4.3-11 Site concentrations of zinc in sediment at SWMU 03-055(c) compared to background

(× = detect, ○ = nondetect)

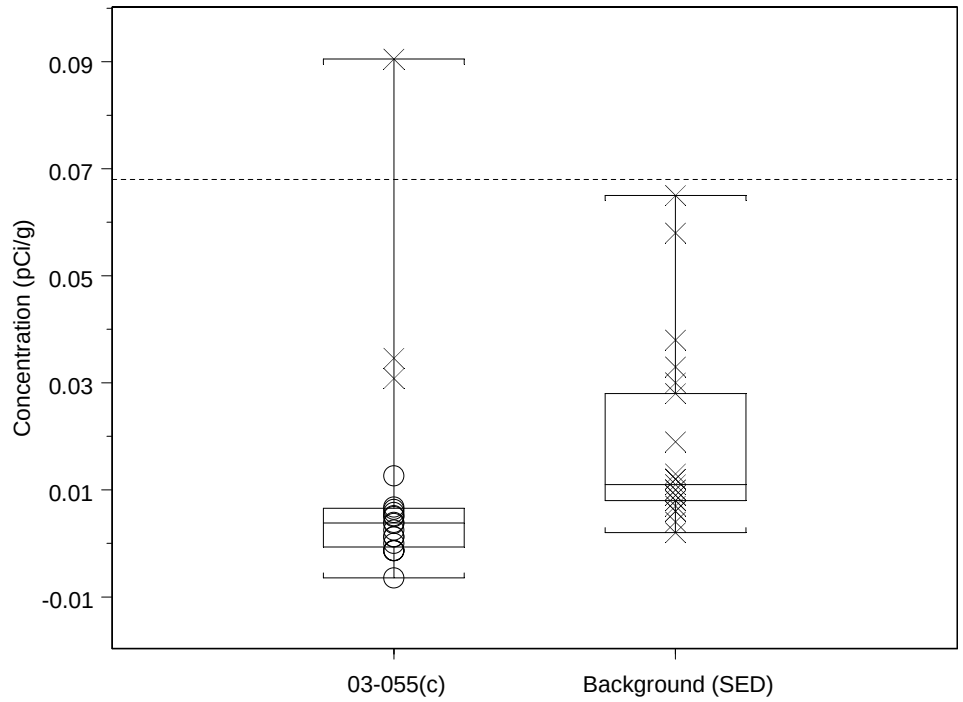


Figure F-4.3-12 Site concentrations of plutonium-239/240 in sediment at SWMU 03-055(c) compared to background

(× = detect, ○ = nondetect)

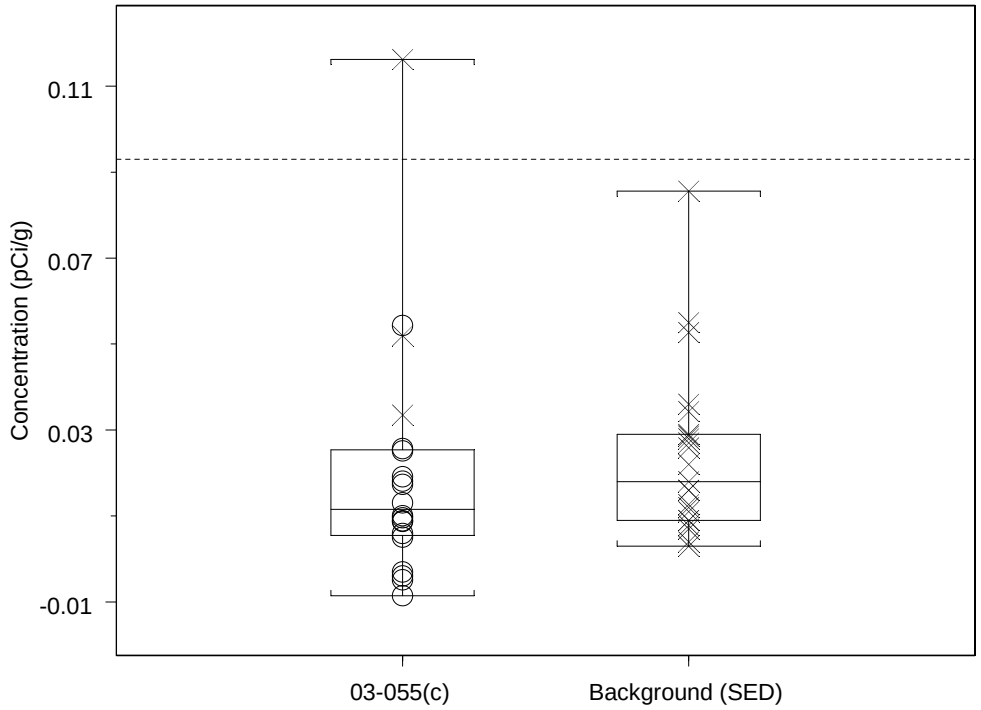


Figure F-4.3-13 Site concentrations of tritium in sediment at SWMU 03-055(c) compared to background

(× = detect, ○ = nondetect)

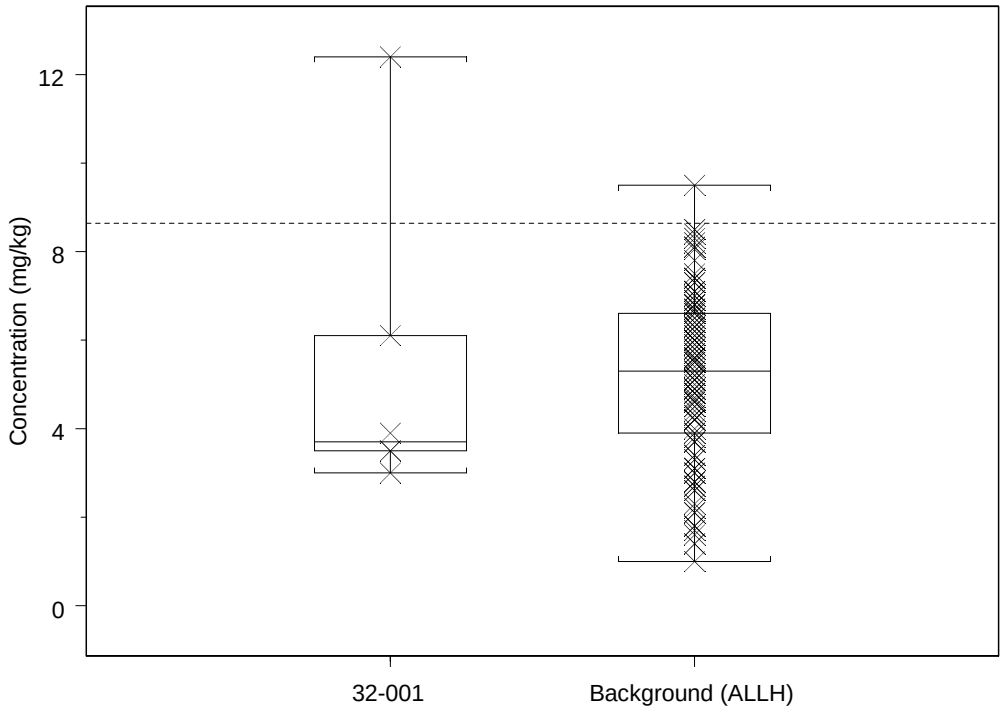


Figure F-5.1-1 Site concentrations of cobalt in soil at SWMU 32-001 compared to background

(× = detect, ○ = nondetect)

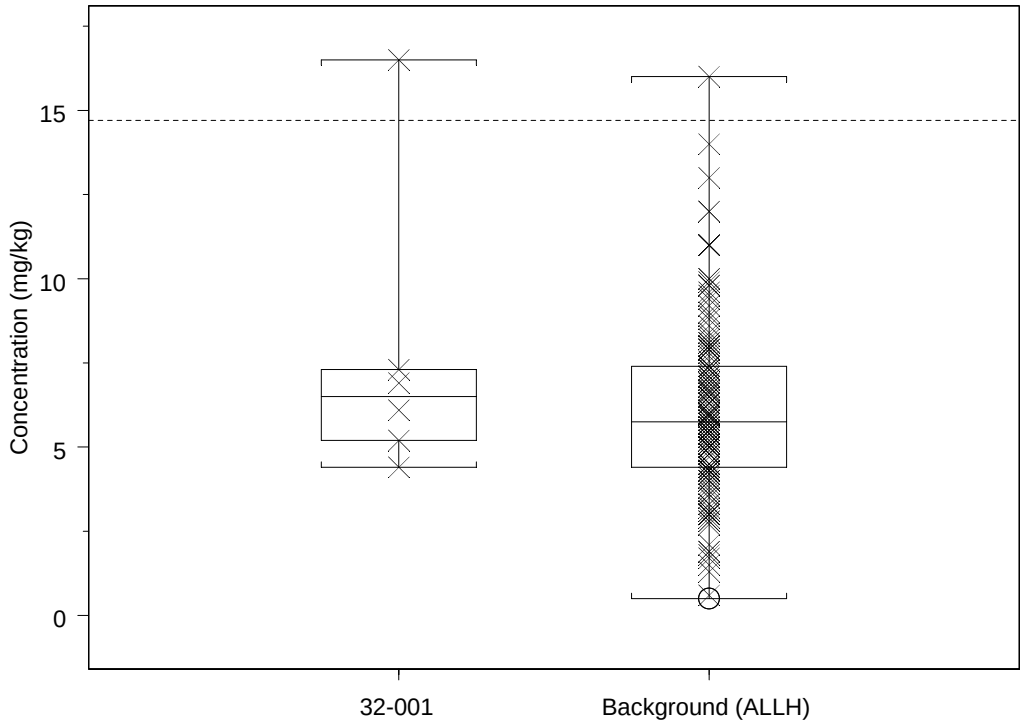


Figure F-5.1-2 Site concentrations of copper in soil at SWMU 32-001 compared to background
(× = detect, ○ = nondetect)

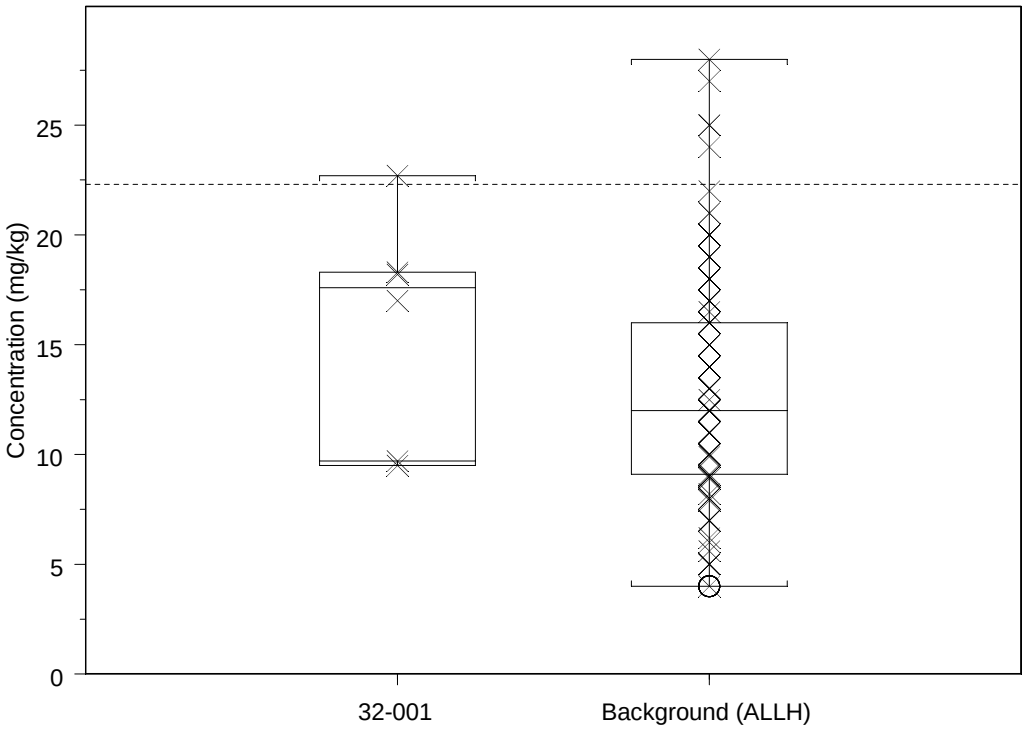


Figure F-5.1-3 Site concentrations of lead in soil at SWMU 32-001 compared to background
(× = detect, ○ = nondetect)

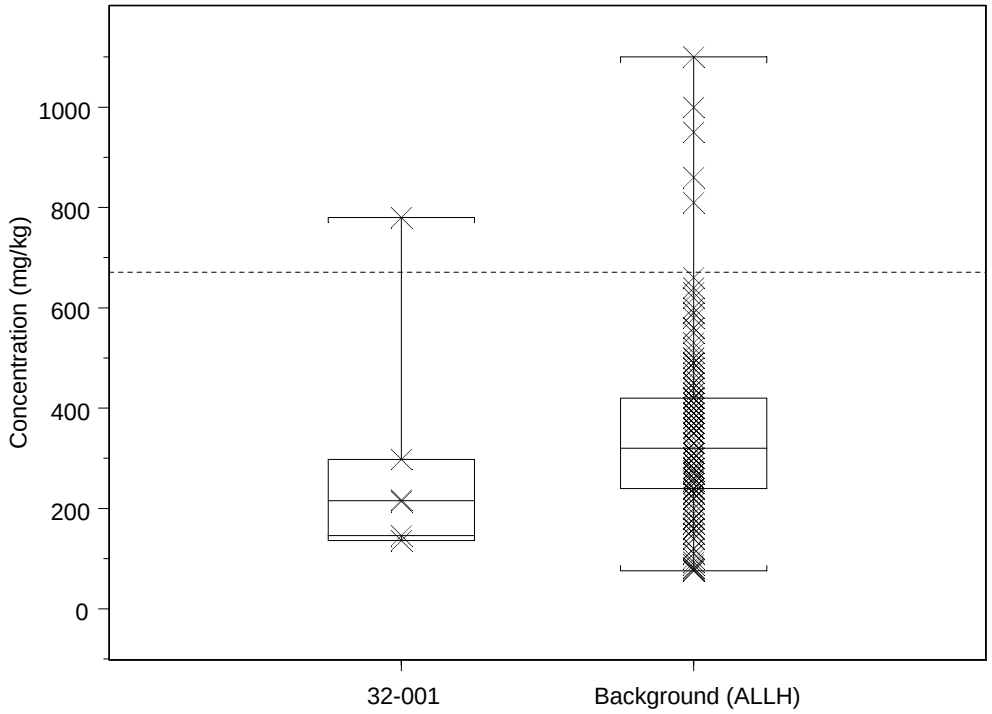


Figure F-5.1-4 Site concentrations of manganese in soil at SWMU 32-001 compared to background

(× = detect, ○ = nondetect)

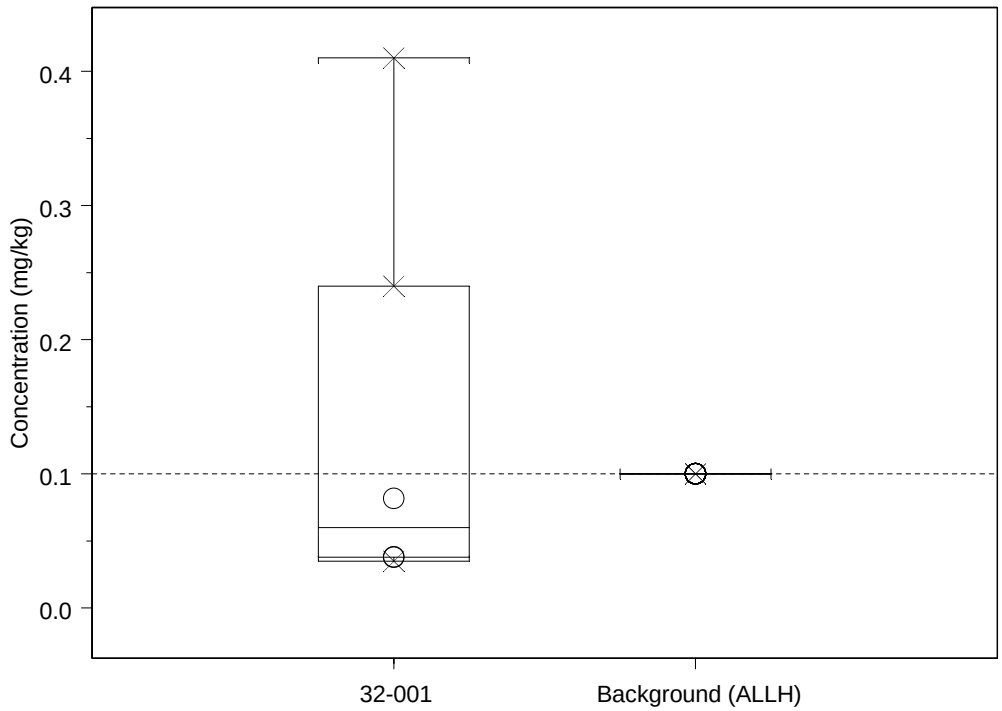


Figure F-5.1-5 Site concentrations of mercury in soil at SWMU 32-001 compared to background

(× = detect, ○ = nondetect)

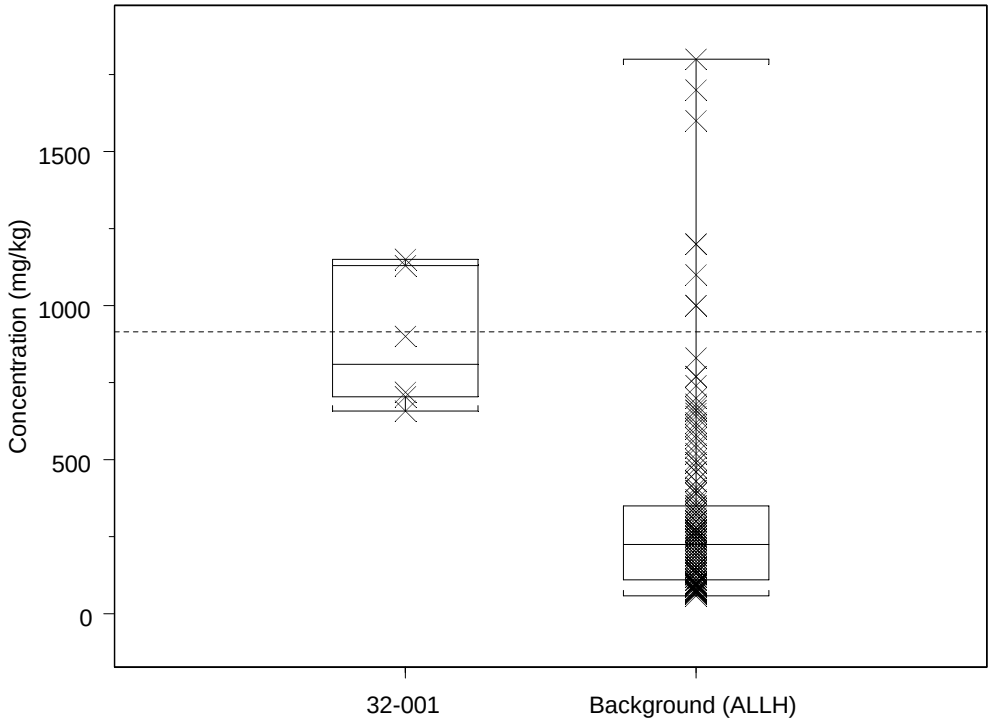


Figure F-5.1-6 Site concentrations of sodium in soil at SWMU 32-001 compared to background
(× = detect, ○ = nondetect)

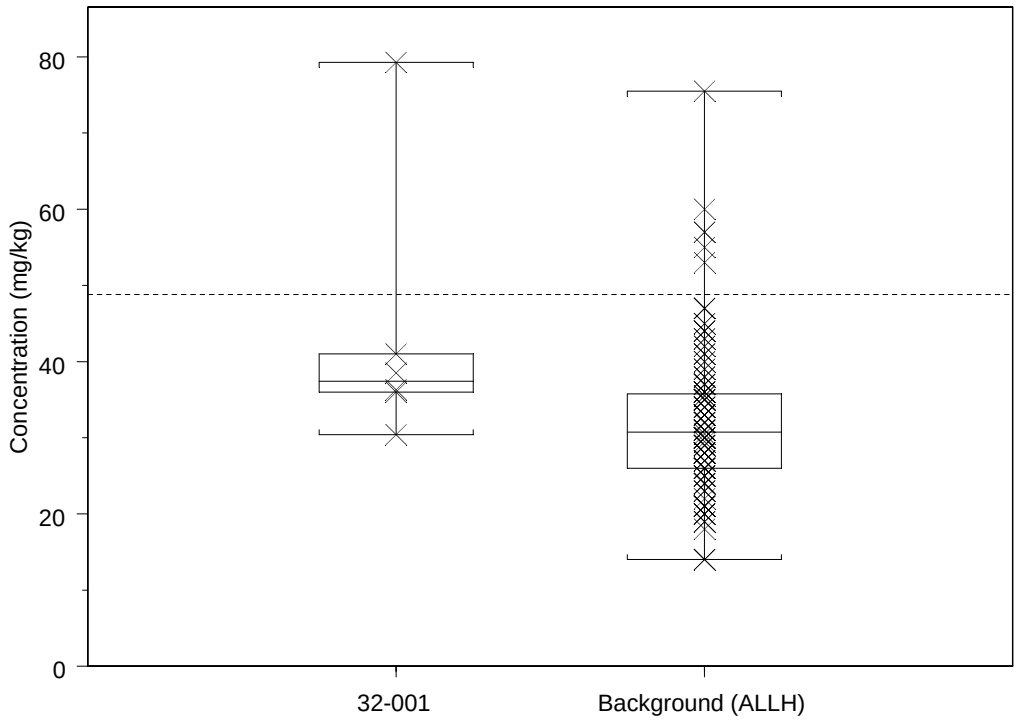


Figure F-5.1-7 Site concentrations of zinc in soil at SWMU 32-001 compared to background
(× = detect, ○ = nondetect)

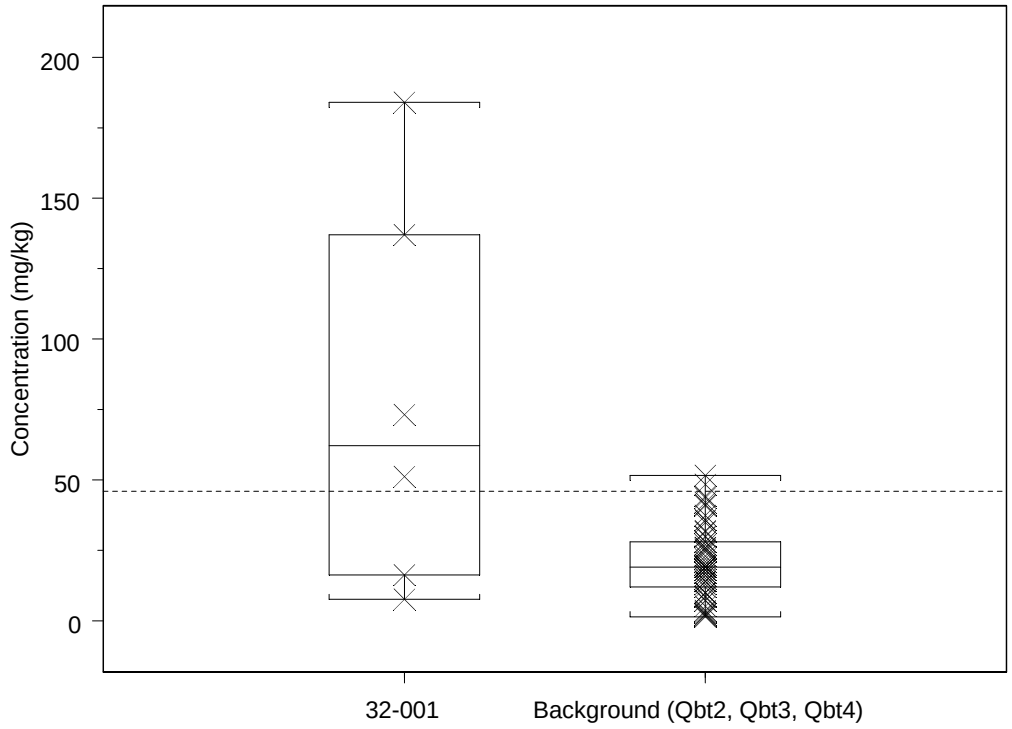


Figure F-5.1-8 Site concentrations of barium in tuff at SWMU 32-001 compared to background
(× = detect, ○ = nondetect)

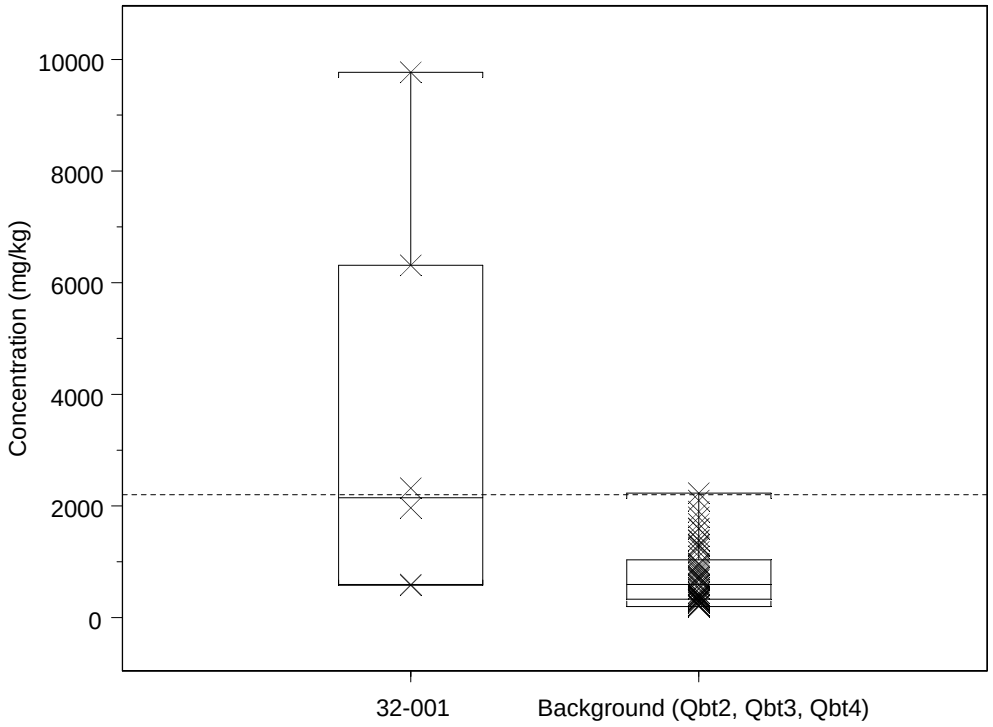


Figure F-5.1-9 Site concentrations of calcium in tuff at SWMU 32-001 compared to background
(× = detect, ○ = nondetect)

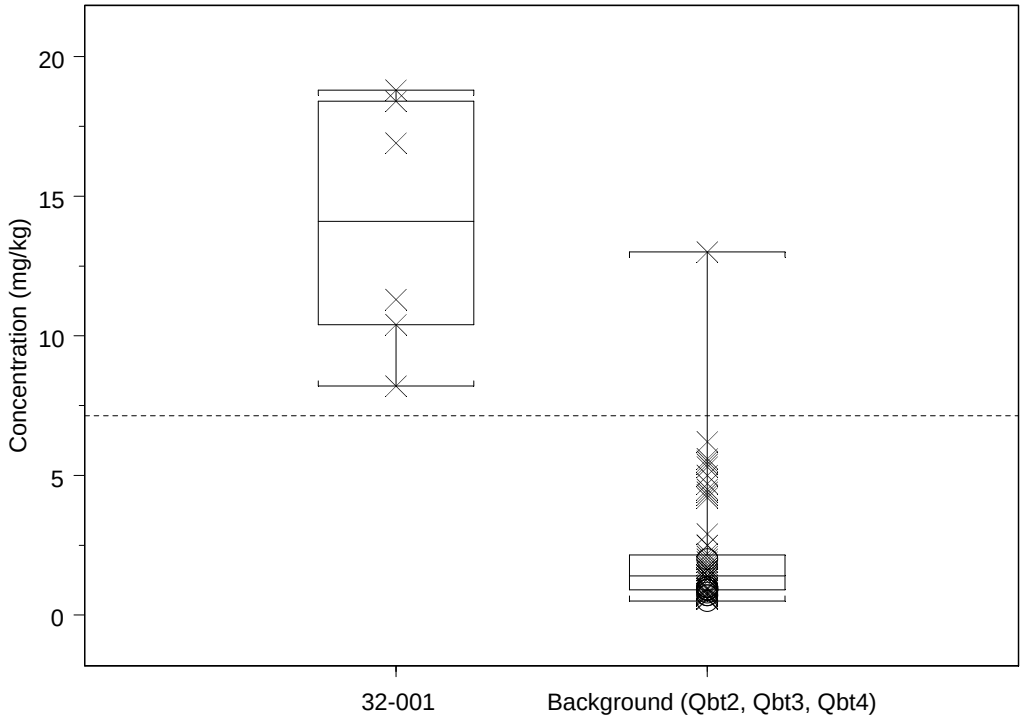


Figure F-5.1-10 Site concentrations of chromium in tuff at SWMU 32-001 compared to background

(× = detect, ○ = nondetect)

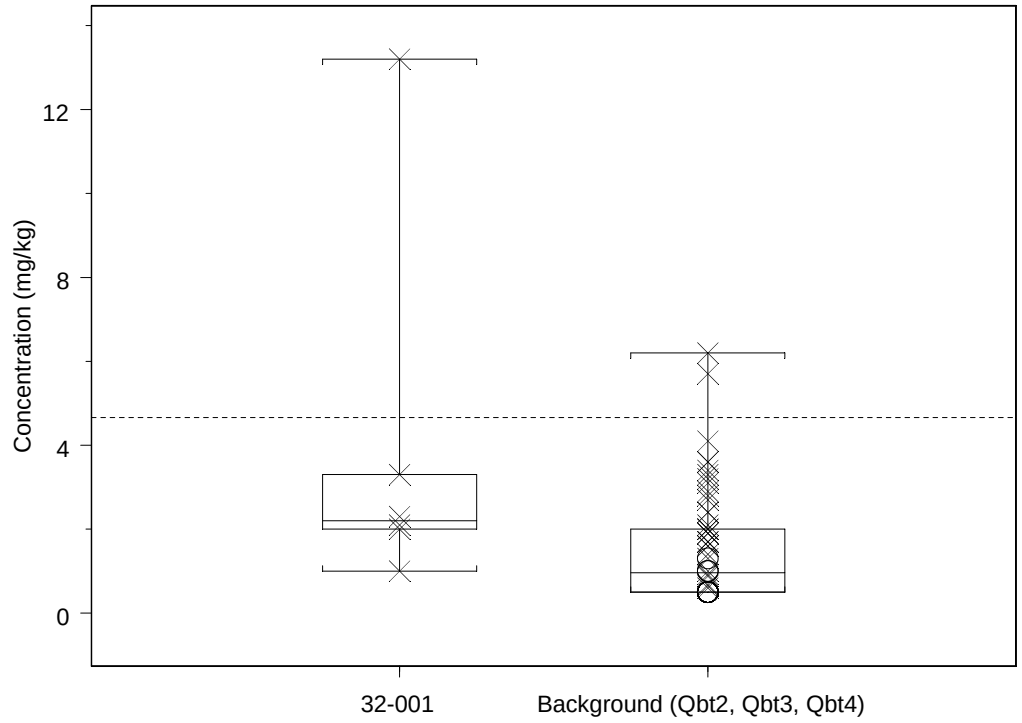


Figure F-5.1-11 Site concentrations of copper in tuff at SWMU 32-001 compared to background

(× = detect, ○ = nondetect)

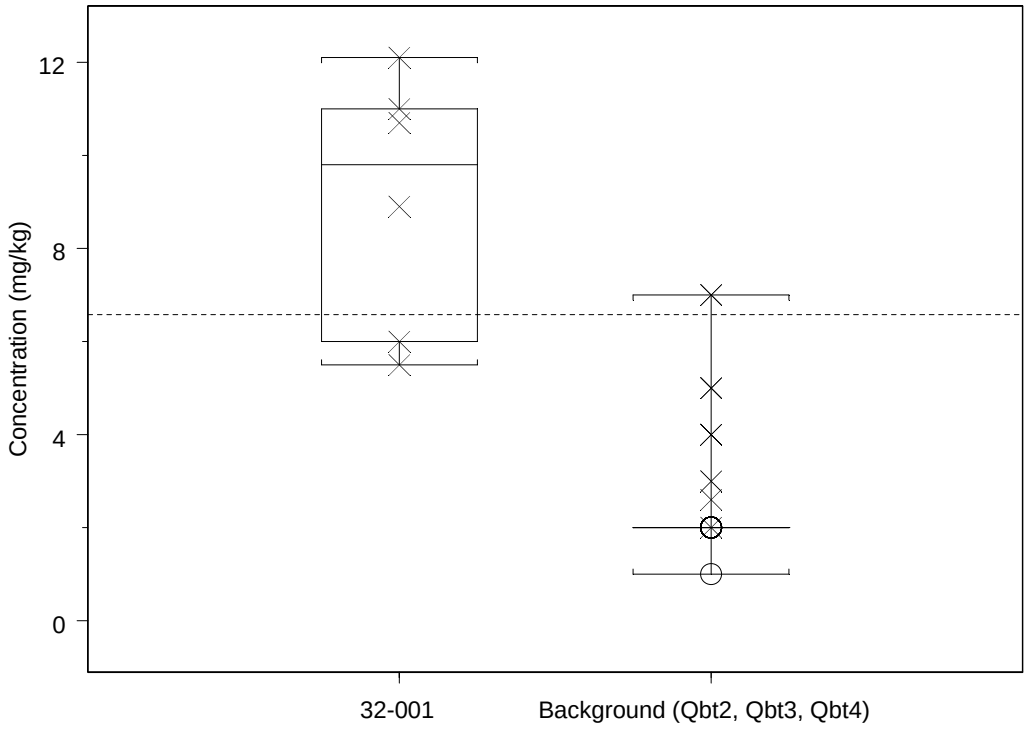


Figure F-5.1-12 Site concentrations of nickel in tuff at SWMU 32-001 compared to background
(× = detect, ○ = nondetect)

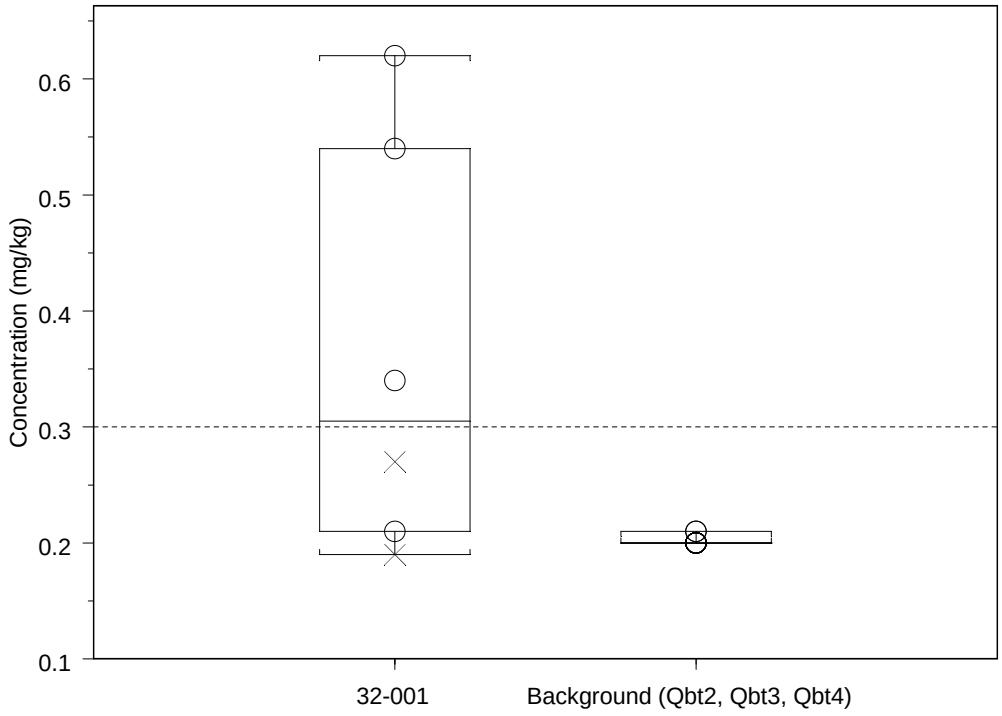


Figure F-5.1-13 Site concentrations of selenium in tuff at SWMU 32-001 compared to background
(× = detect, ○ = nondetect)

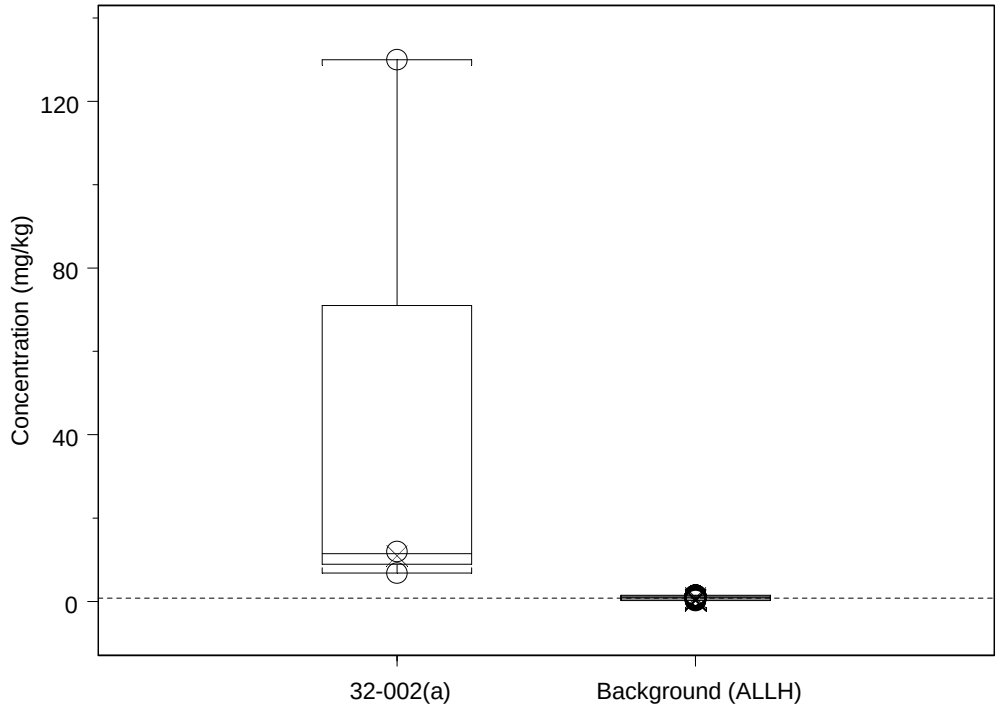


Figure F-5.2-1 Site concentrations of antimony in soil at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

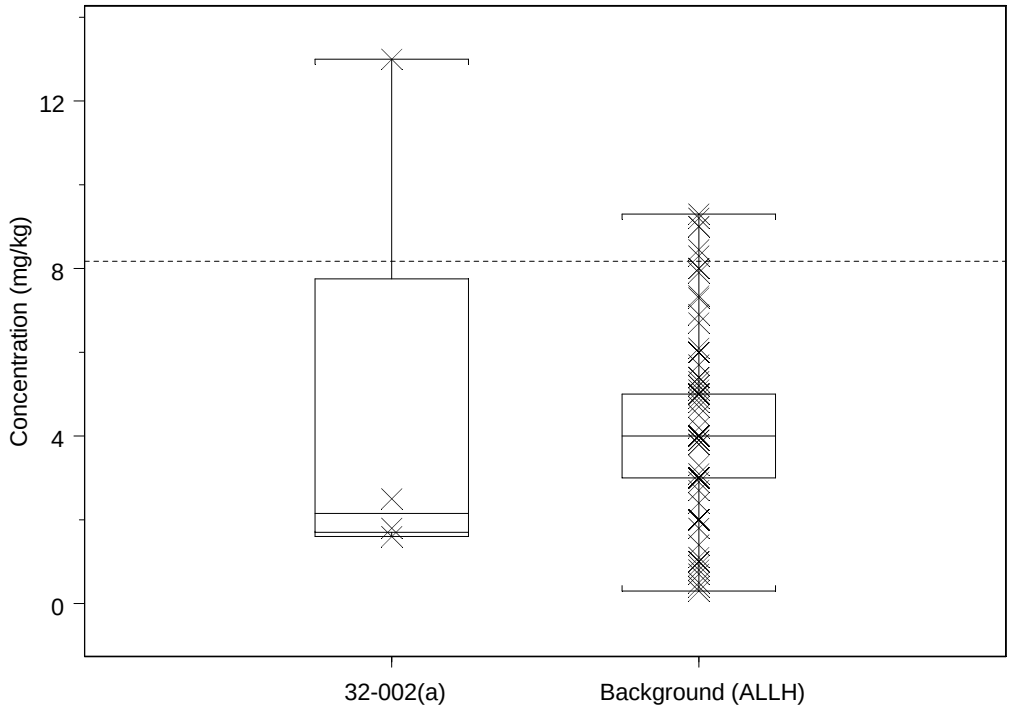


Figure F-5.2-2 Site concentrations of arsenic in soil at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

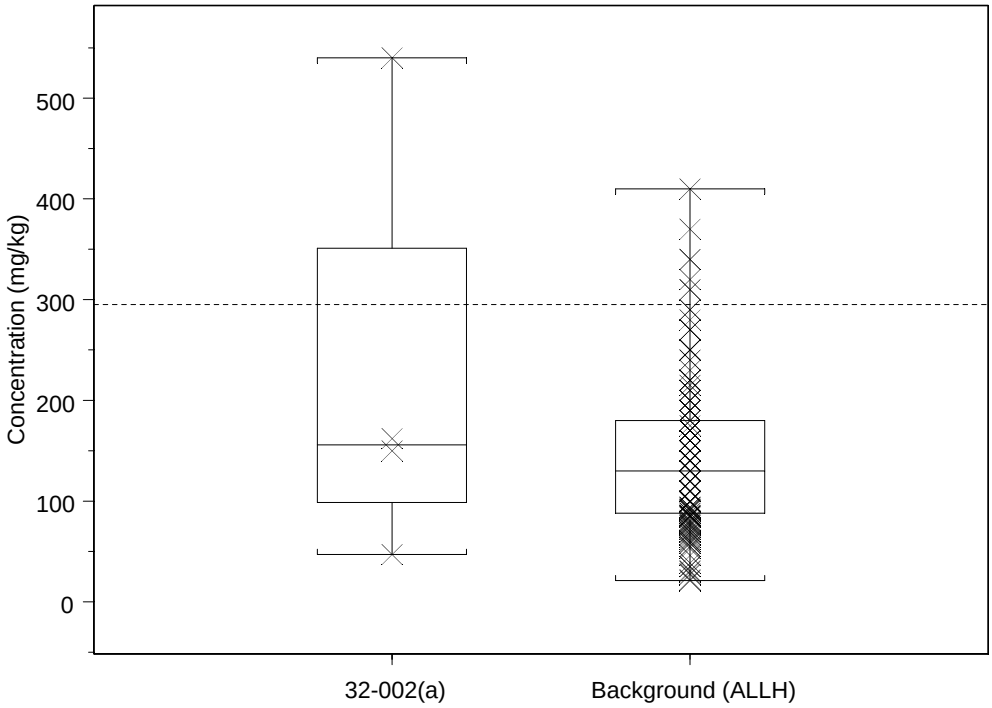


Figure F-5.2-3 Site concentrations of barium in soil at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

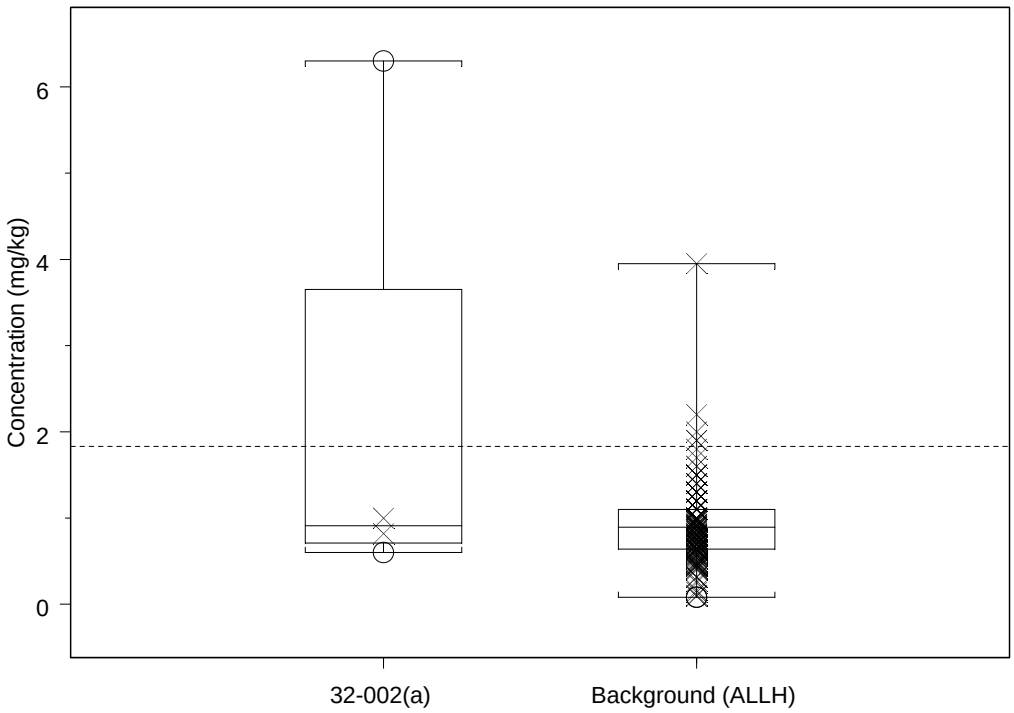


Figure F-5.2-4 Site concentrations of beryllium in soil at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

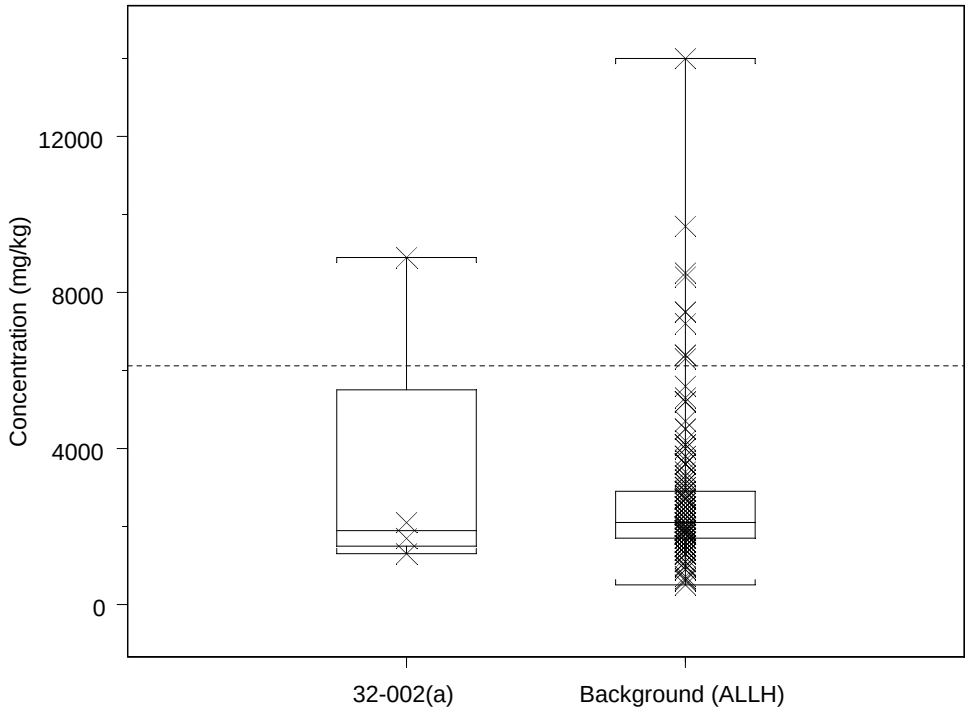


Figure F-5.2-5 Site concentrations of calcium in soil at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

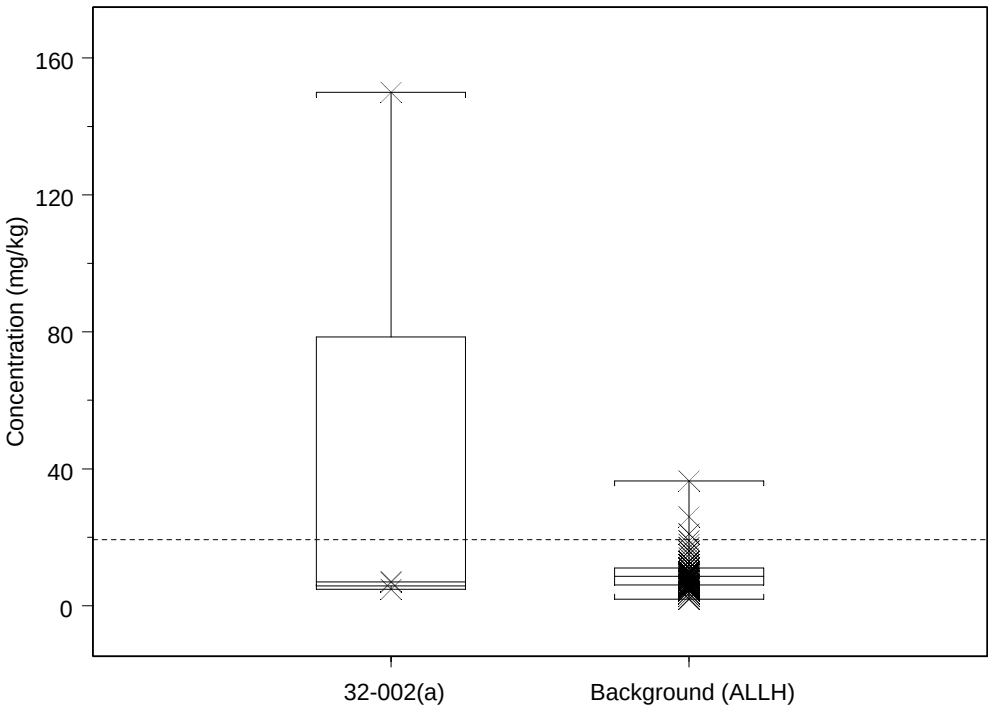


Figure F-5.2-6 Site concentrations of chromium in soil at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

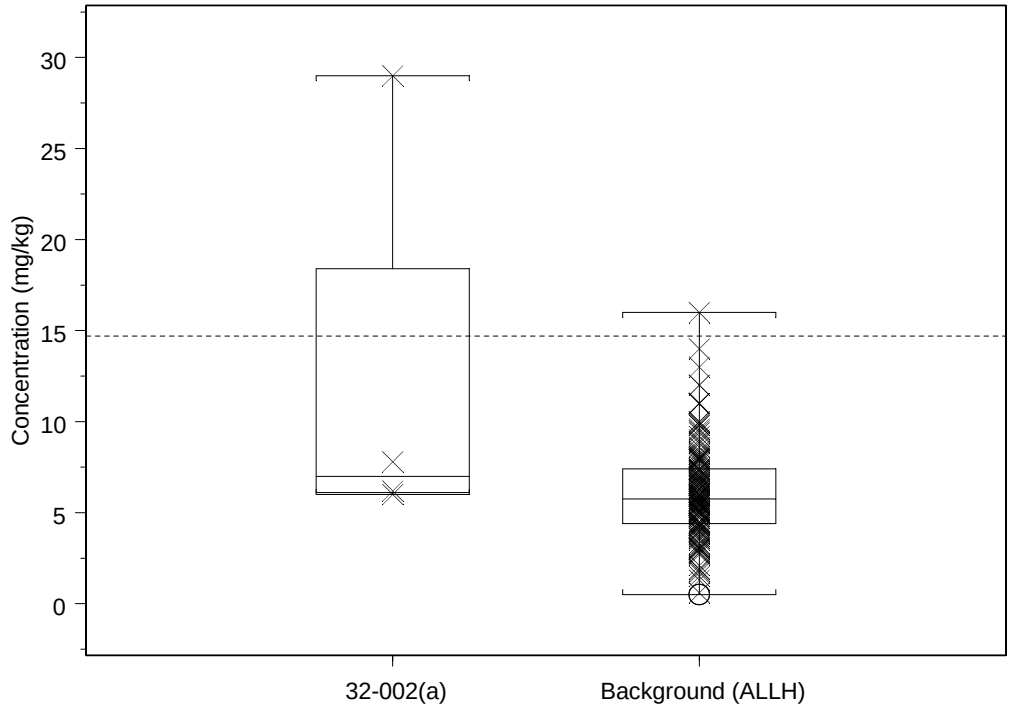


Figure F-5.2-7 Site concentrations of copper in soil at SWMU 32-002(a) compared to background
(× = detect, ○ = nondetect)

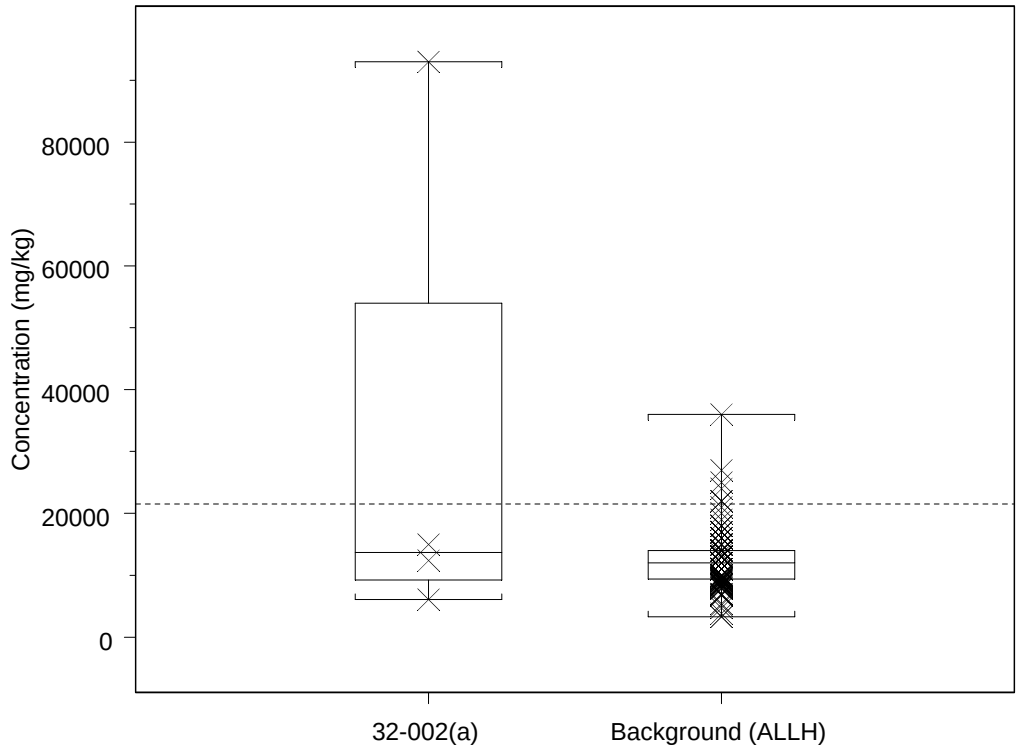


Figure F-5.2-8 Site concentrations of iron in soil at SWMU 32-002(a) compared to background
(× = detect, ○ = nondetect)

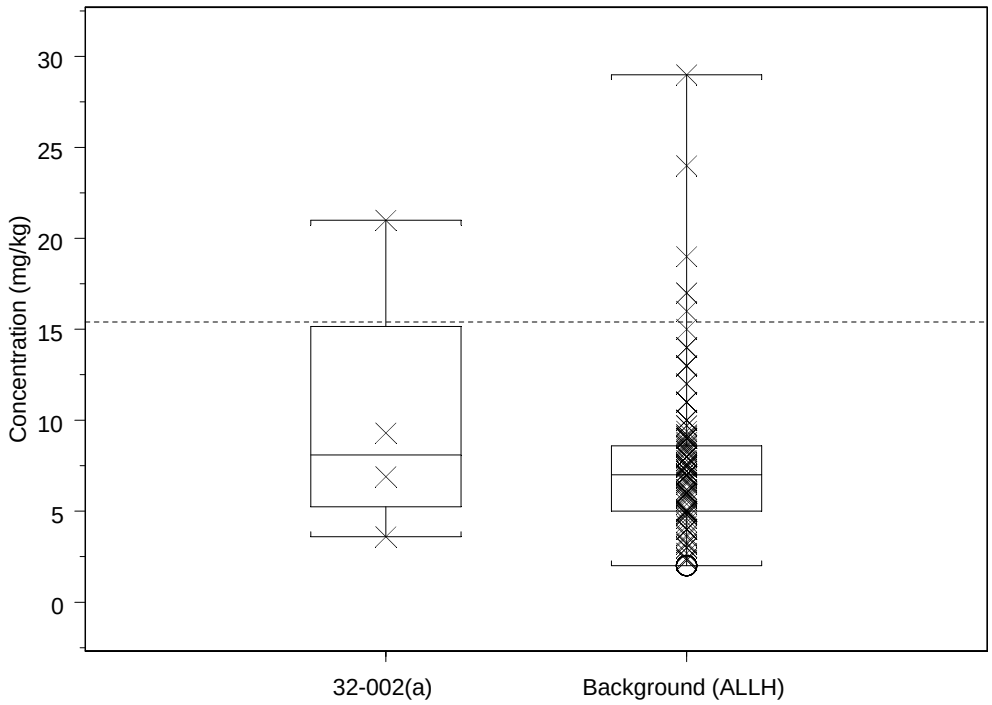


Figure F-5.2-9 Site concentrations of nickel in soil at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

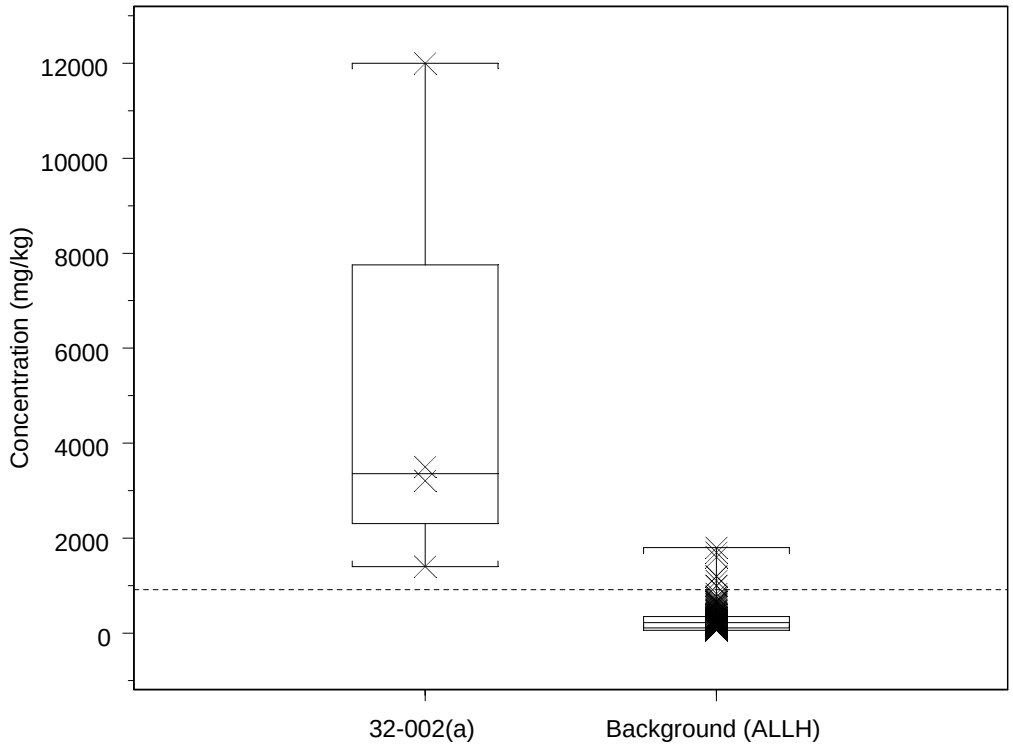


Figure F-5.2-10 Site concentrations of sodium in soil at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

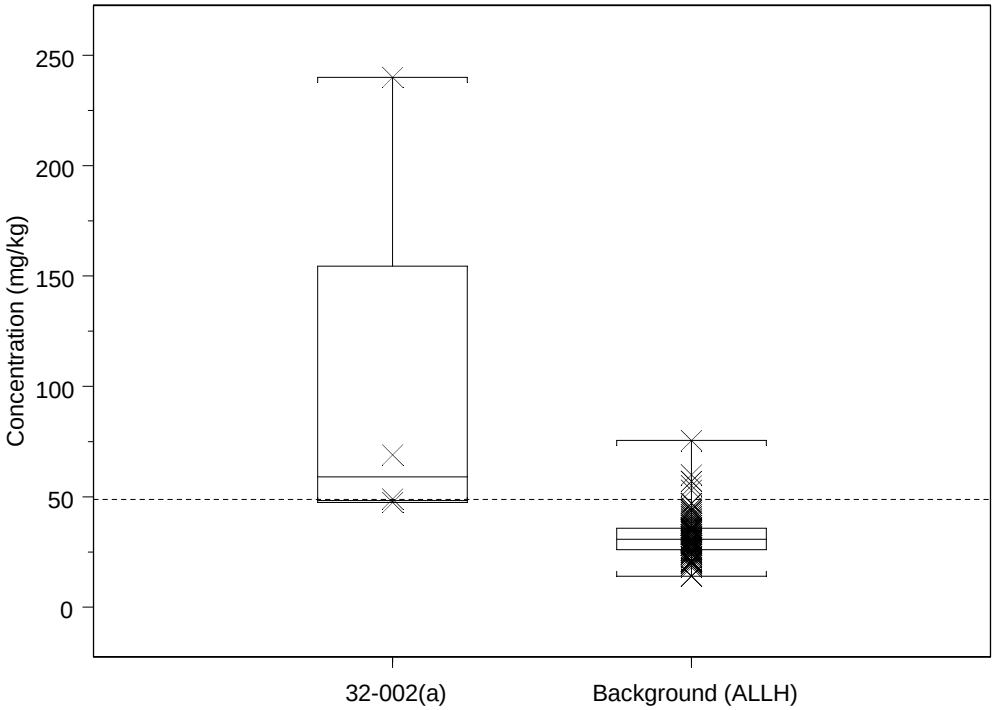


Figure F-5.2-11 Site concentrations of zinc in soil at SWMU 32-002(a) compared to background
(× = detect, ○ = nondetect)

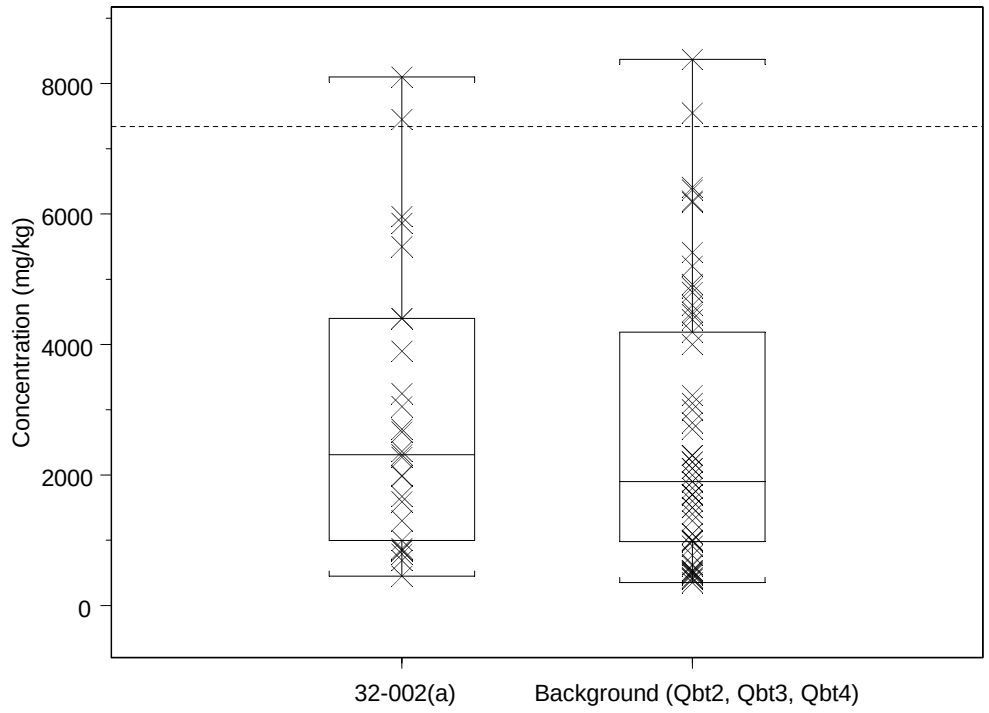


Figure F-5.2-12 Site concentrations of aluminum in tuff at SWMU 32-002(a) compared to background
(× = detect, ○ = nondetect)

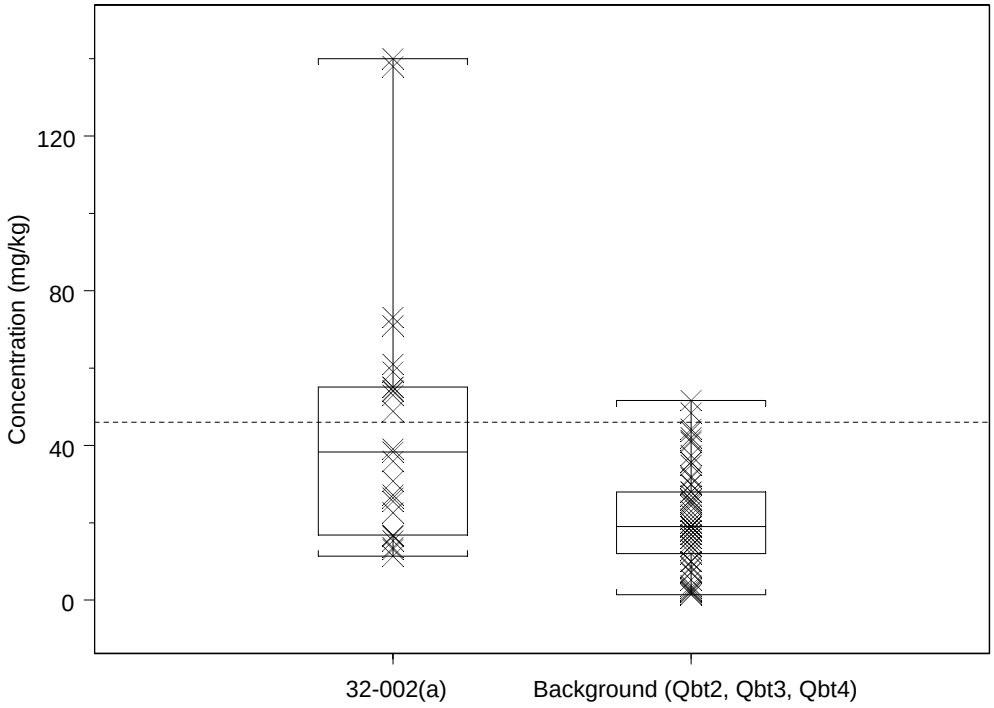


Figure F-5.2-13 Site concentrations of barium in tuff at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

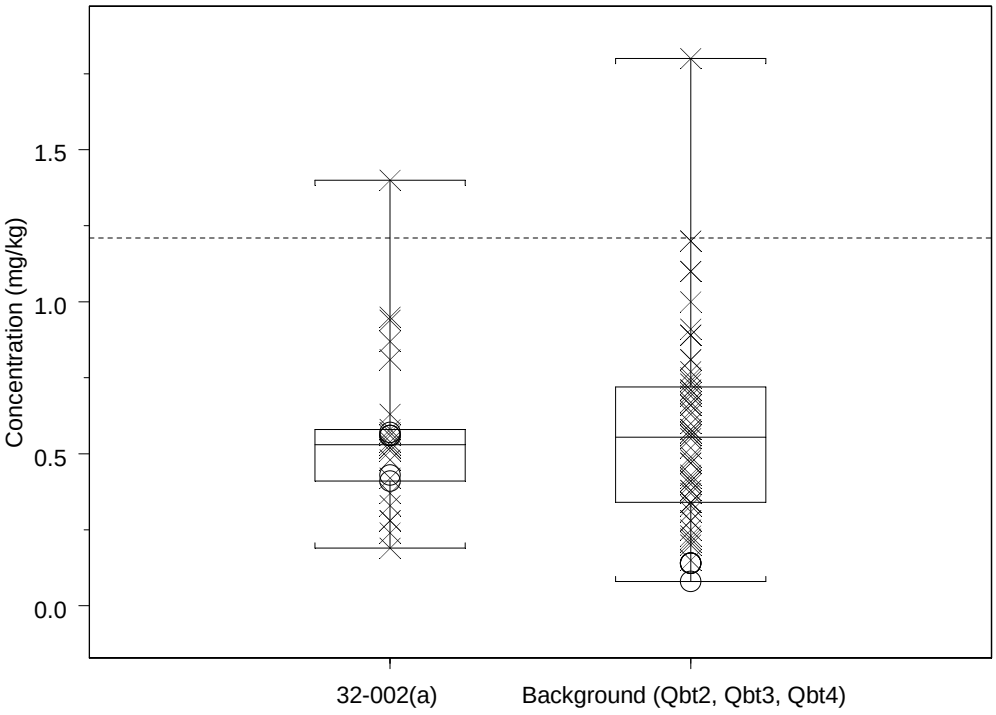


Figure F-5.2-14 Site concentrations of beryllium in tuff at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

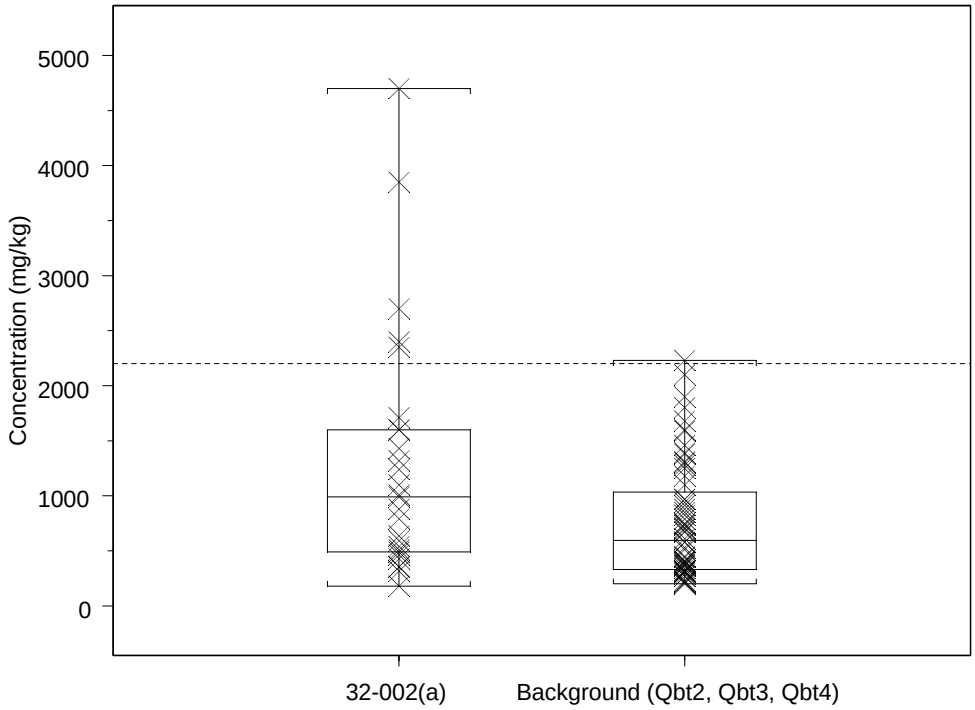


Figure F-5.2-15 Site concentrations of calcium in tuff at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

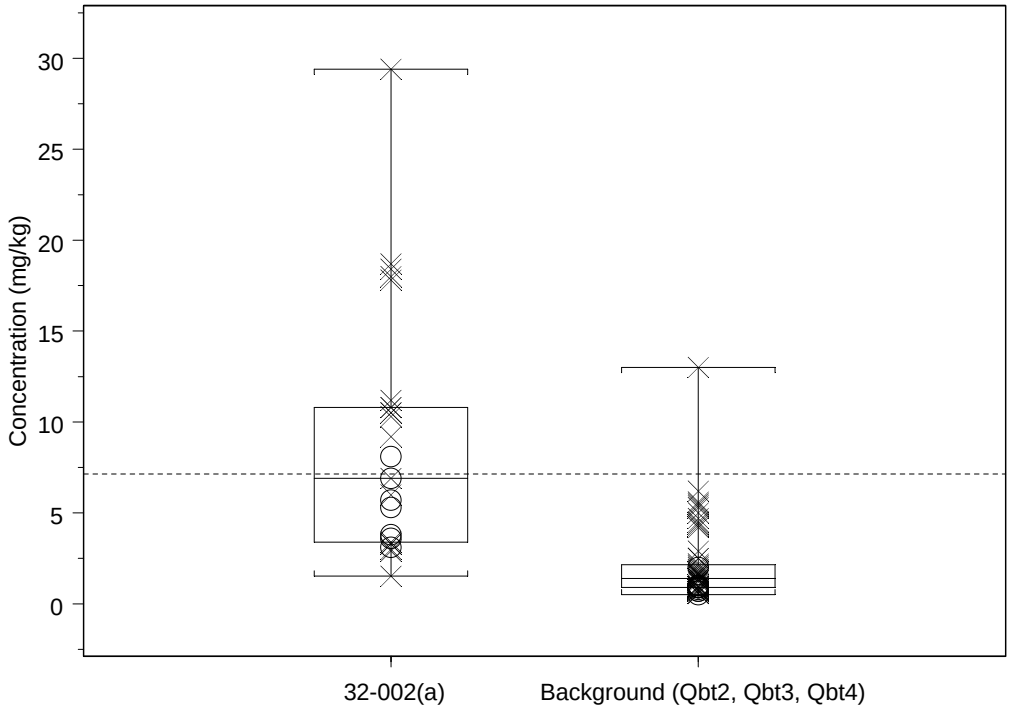


Figure F-5.2-16 Site concentrations of chromium in tuff at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

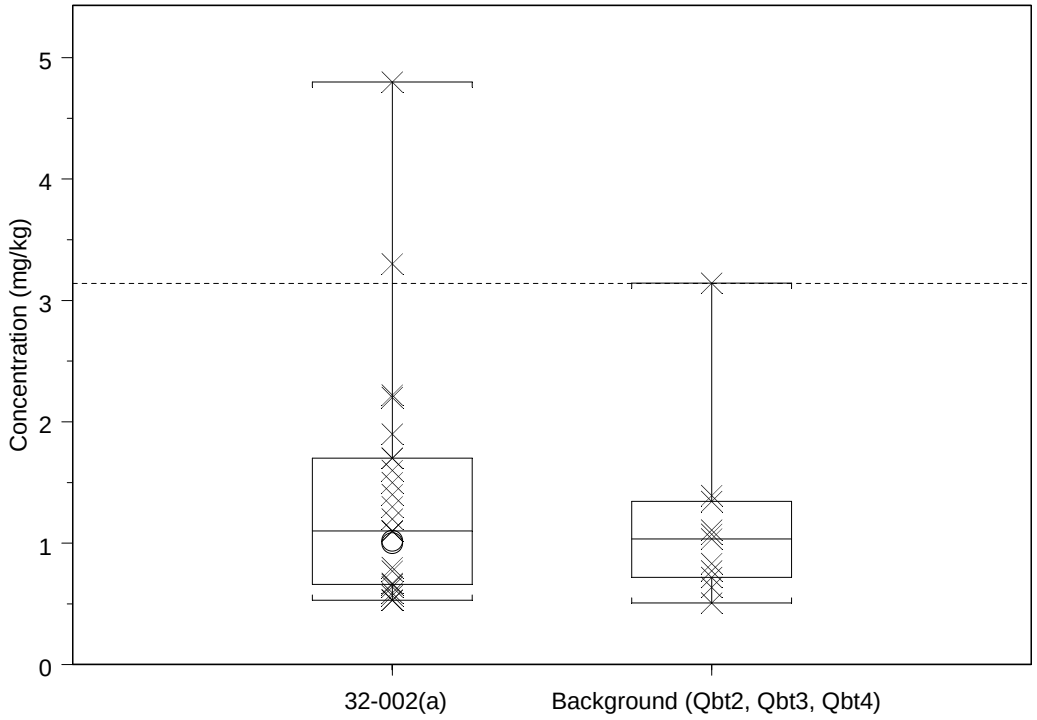


Figure F-5.2-17 Site concentrations of cobalt in tuff at SWMU 32-002(a) compared to background
(× = detect, ○ = nondetect)

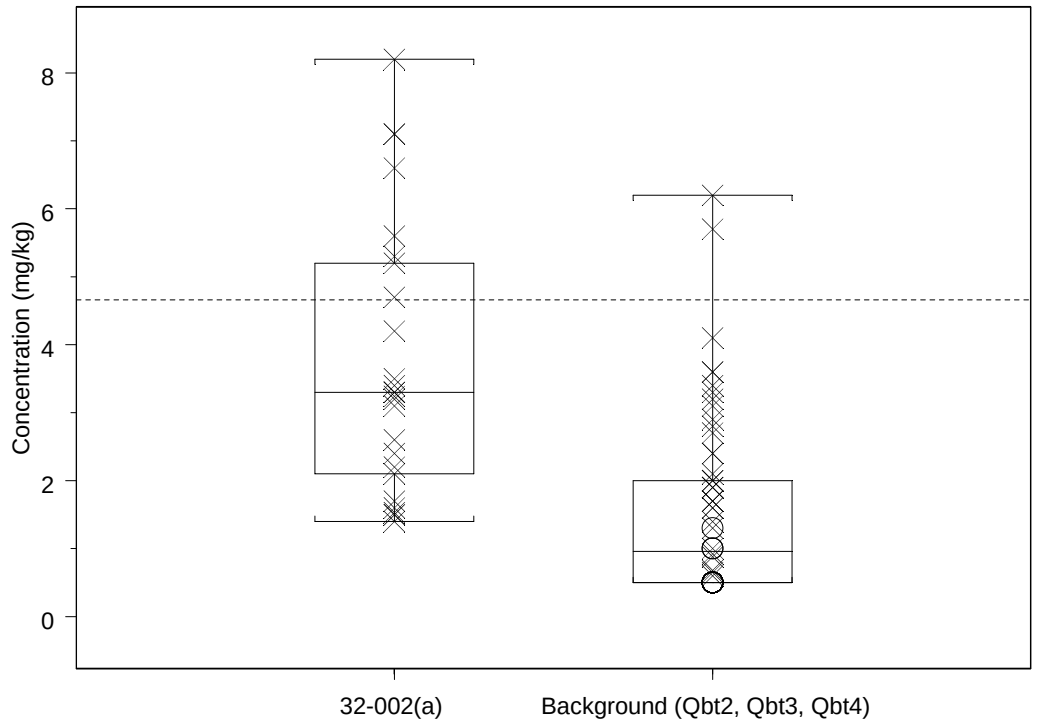


Figure F-5.2-18 Site concentrations of copper in tuff at SWMU 32-002(a) compared to background
(× = detect, ○ = nondetect)

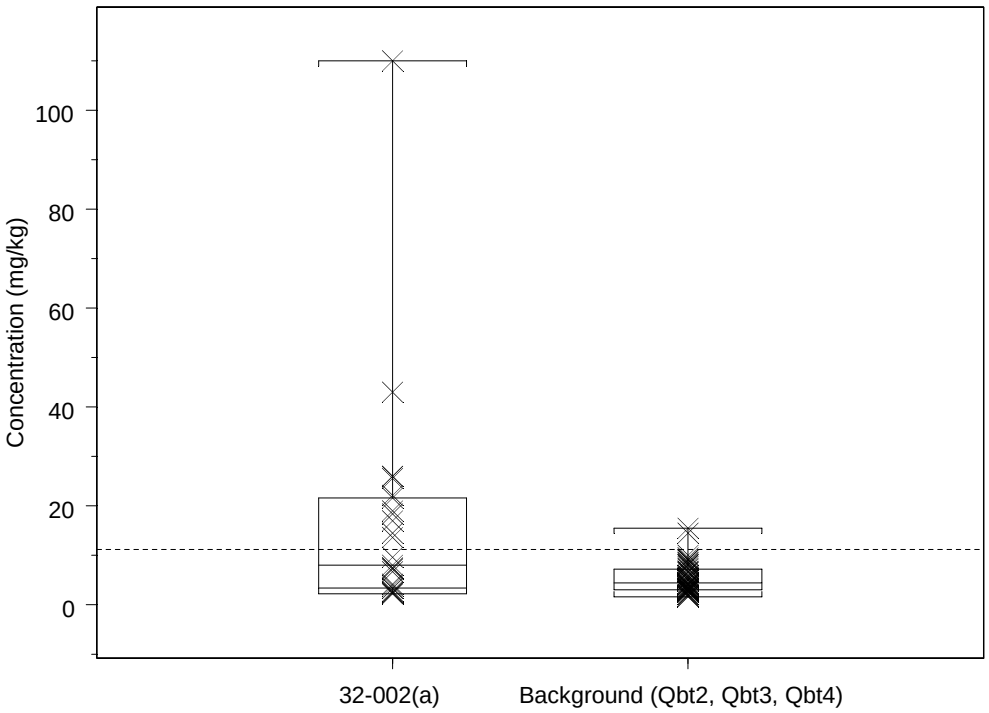


Figure F-5.2-19 Site concentrations of lead in tuff at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

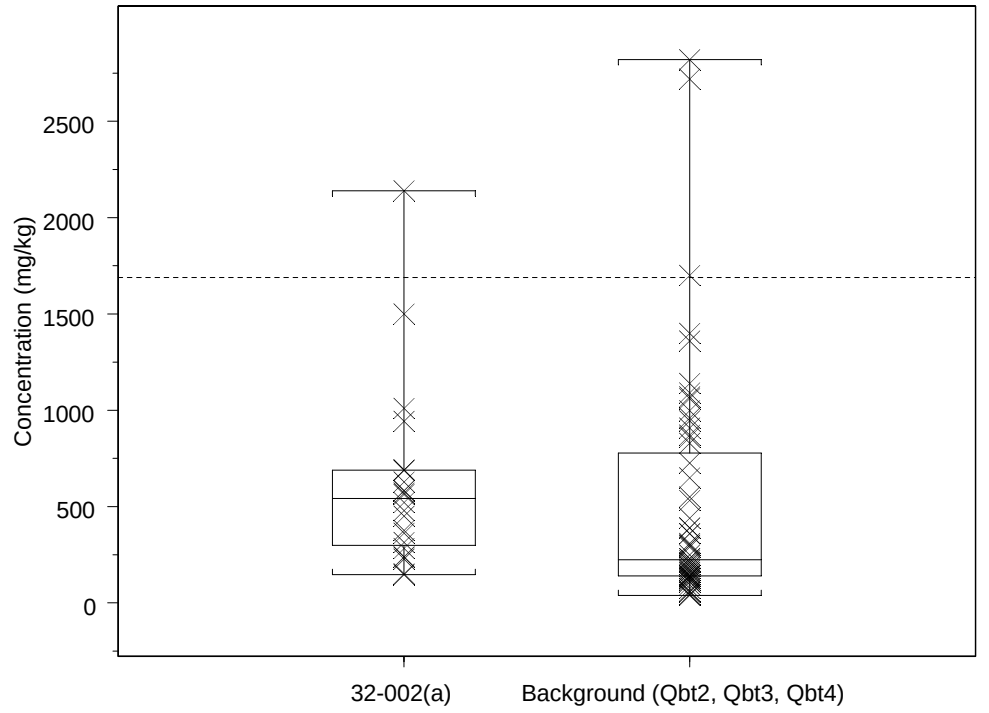


Figure F-5.2-20 Site concentrations of magnesium in tuff at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

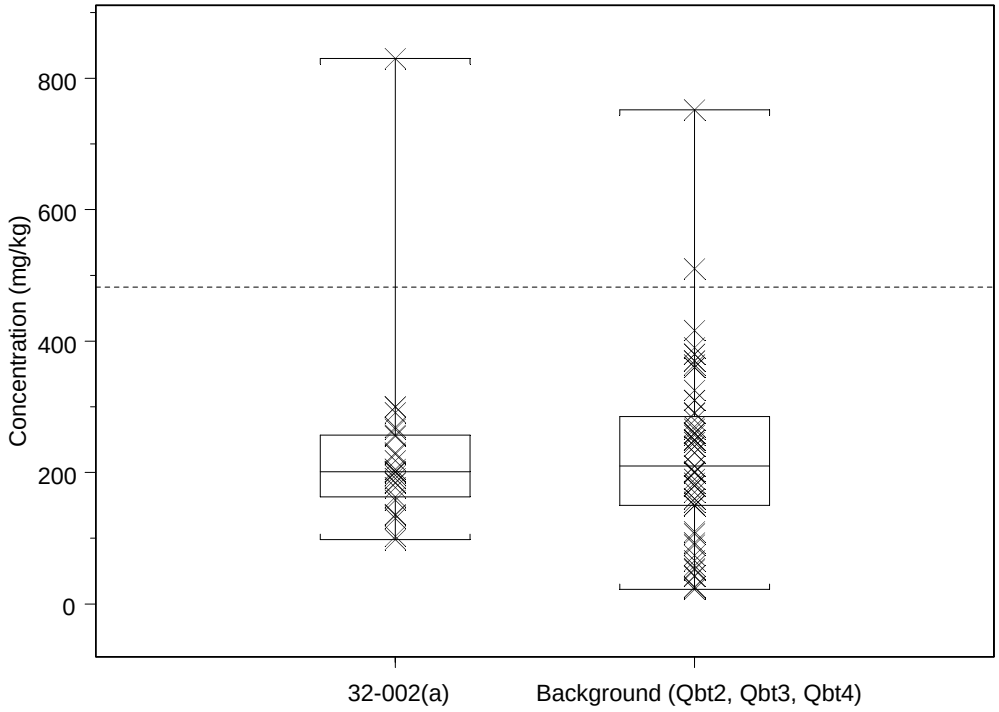


Figure F-5.2-21 Site concentrations of manganese in tuff at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

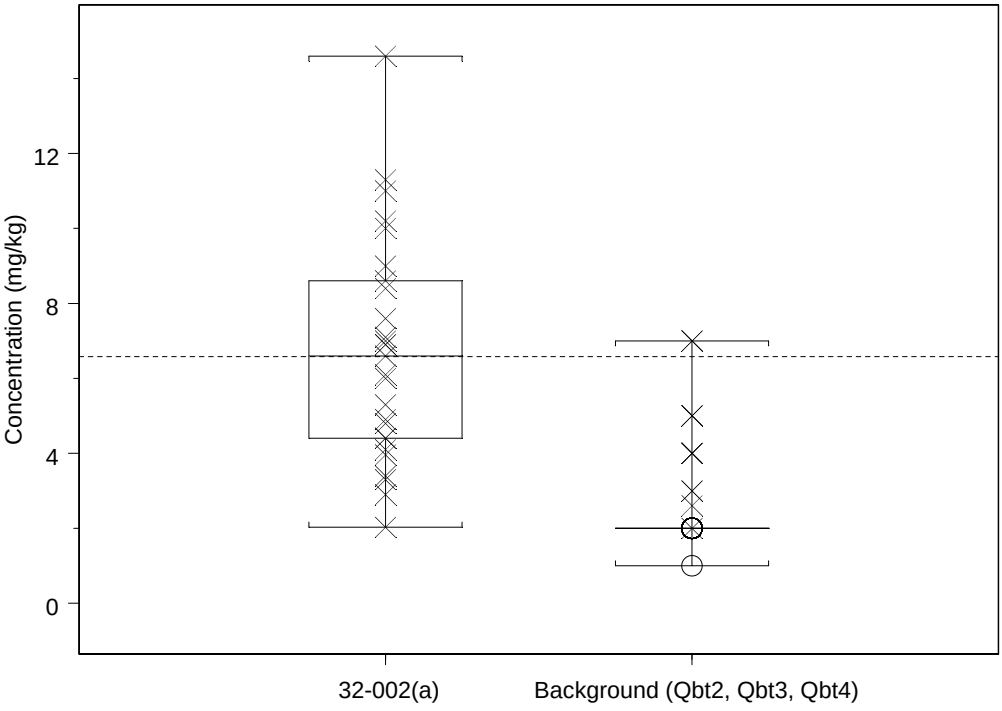


Figure F-5.2-22 Site concentrations of nickel in tuff at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

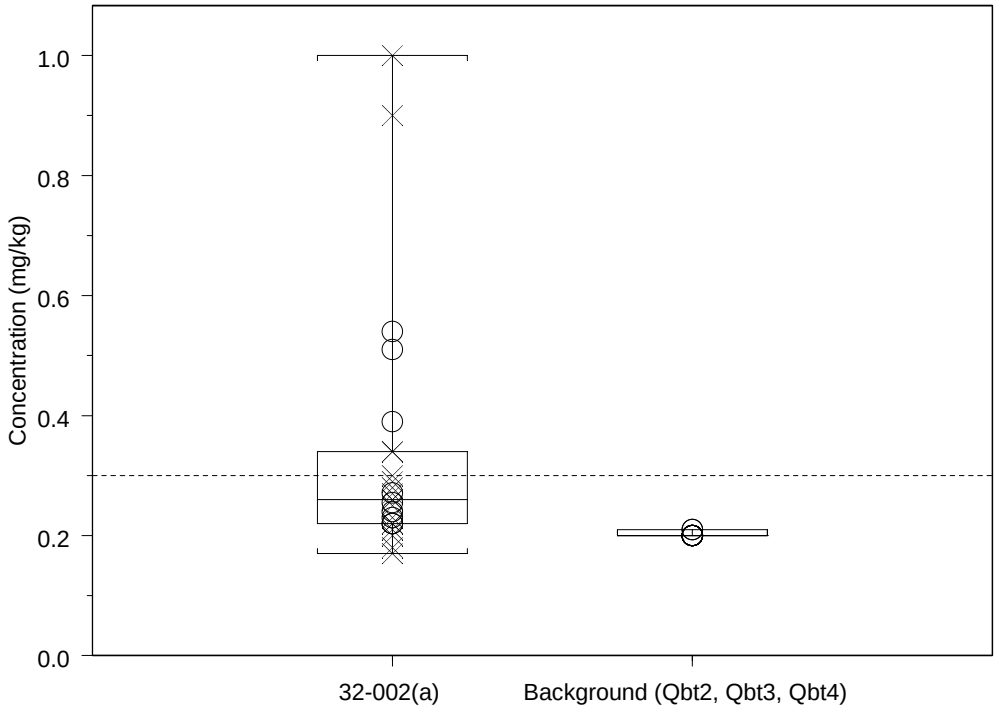


Figure F-5.2-23 Site concentrations of selenium in tuff at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

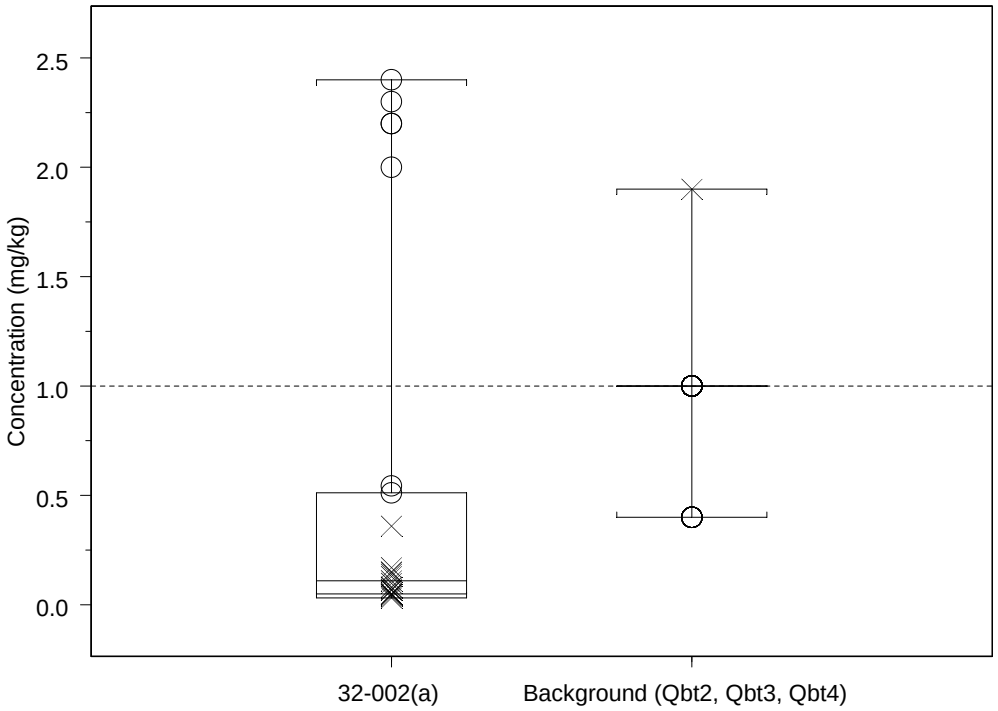


Figure F-5.2-24 Site concentrations of silver in tuff at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

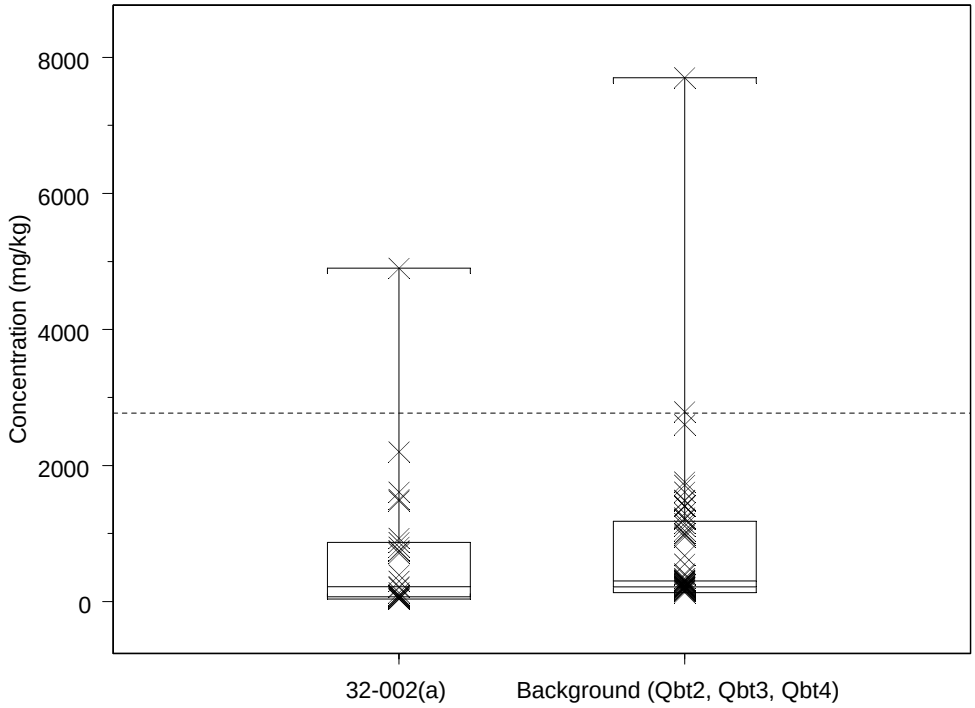


Figure F-5.2-25 Site concentrations of sodium in tuff at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

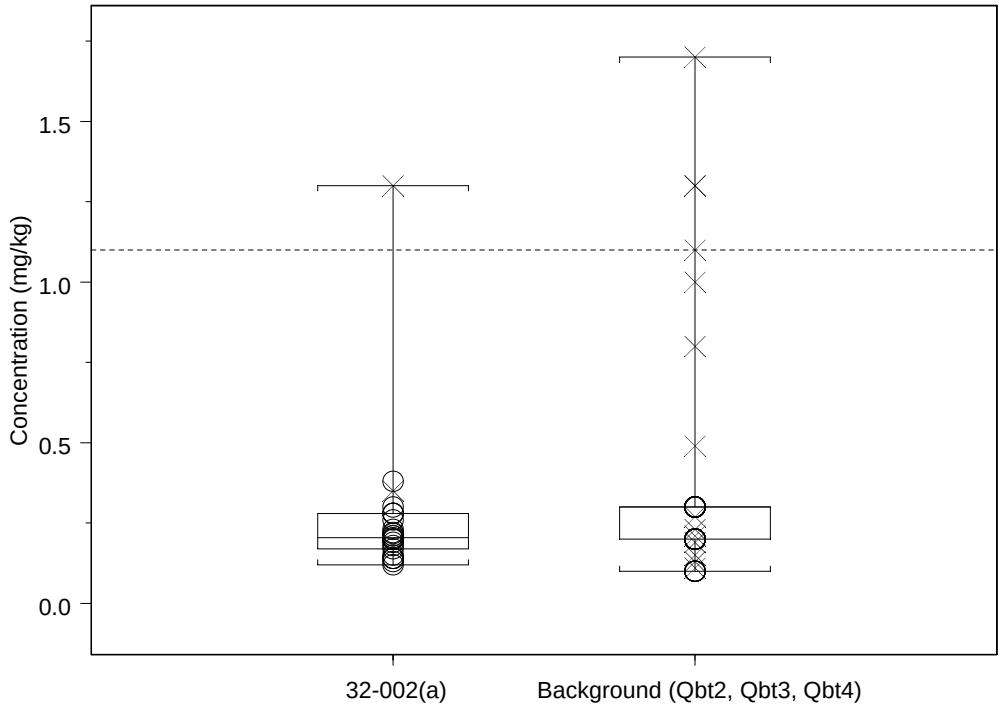


Figure F-5.2-26 Site concentrations of thallium in tuff at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

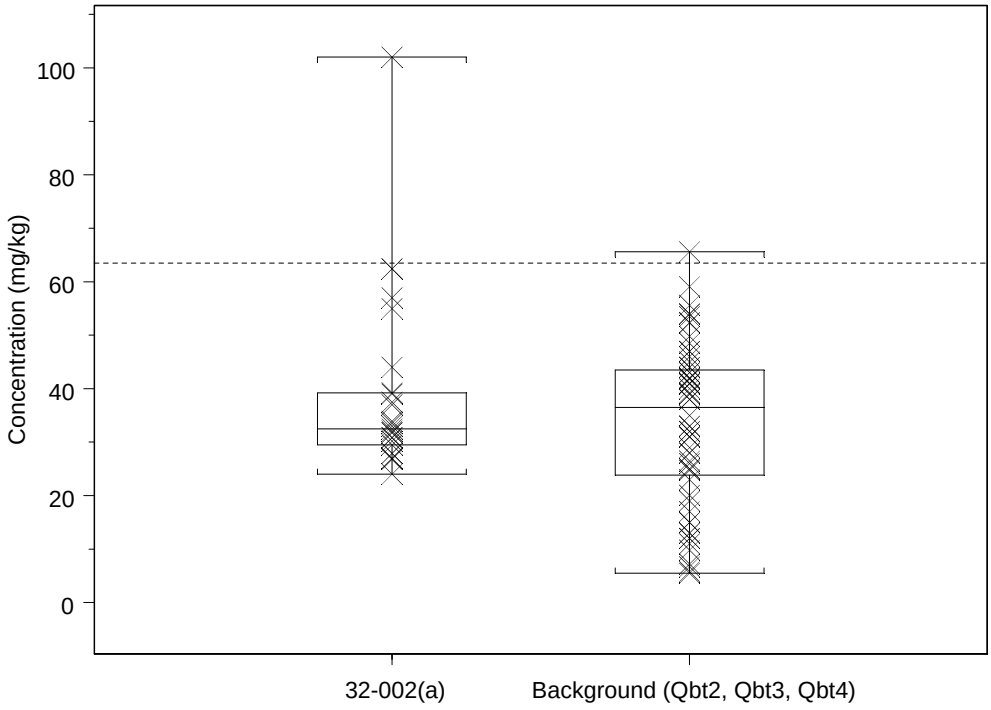


Figure F-5.2-27 Site concentrations of zinc in tuff at SWMU 32-002(a) compared to background
(× = detect, ○ = nondetect)

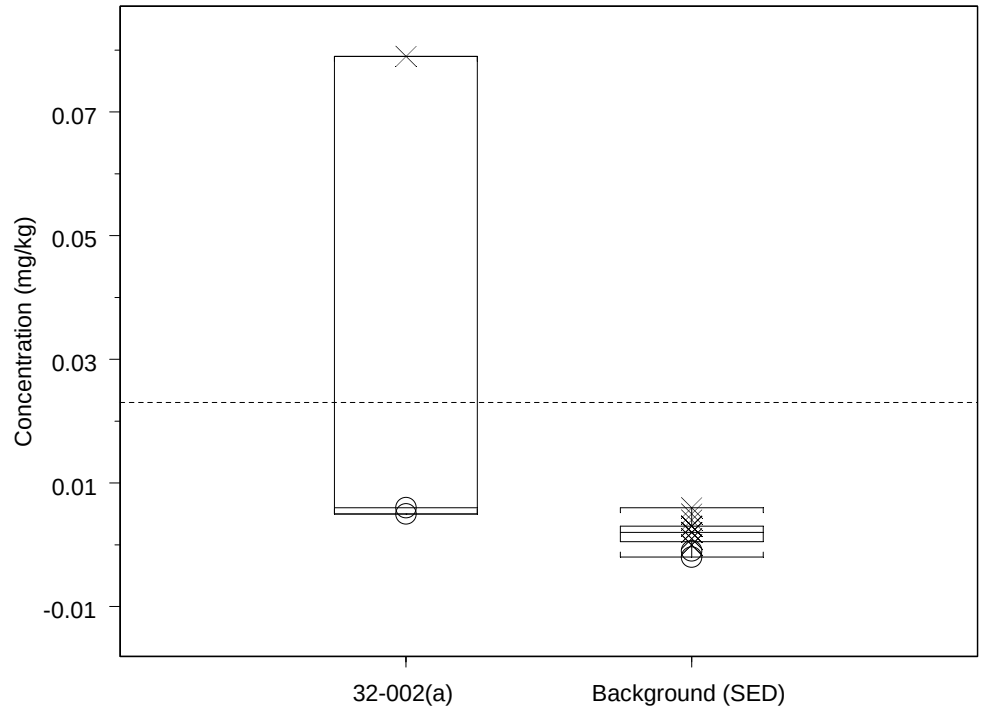


Figure F-5.2-28 Site concentrations of plutonium-238 in tuff at SWMU 32-002(a) compared to background
(× = detect, ○ = nondetect)

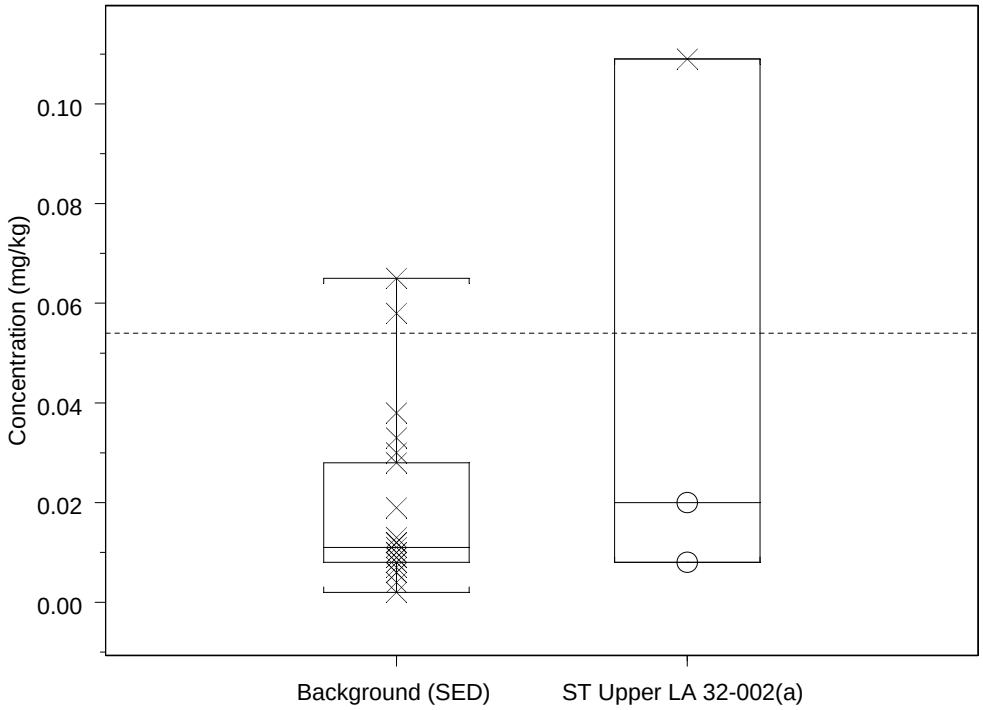


Figure F-5.2-29 Site concentrations of plutonium-239/240 in tuff at SWMU 32-002(a) compared to background

(× = detect, ○ = nondetect)

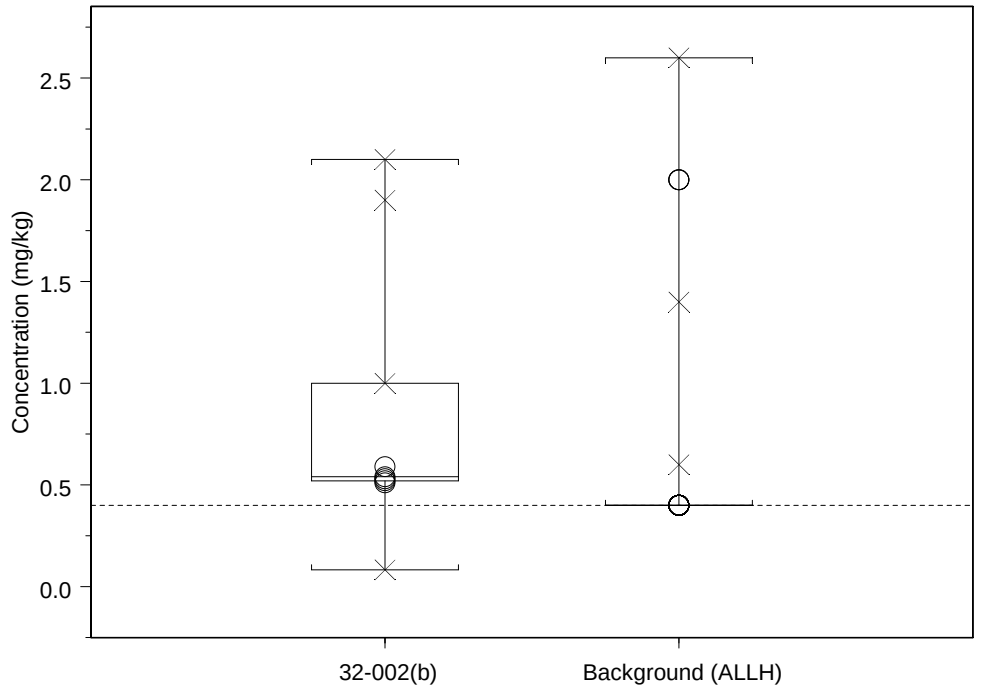


Figure F-5.3-1 Site concentrations of cadmium in soil at SWMU 32-002(b) compared to background

(× = detect, ○ = nondetect)

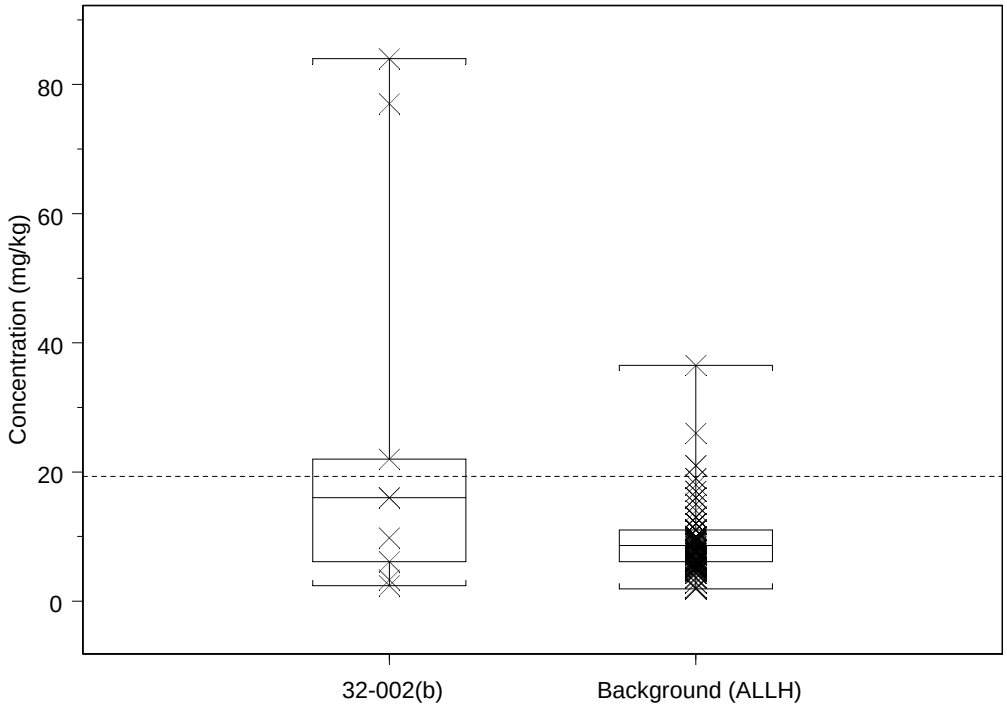


Figure F-5.3-2 Site concentrations of chromium in soil at SWMU 32-002(b) compared to background

(× = detect, ○ = nondetect)

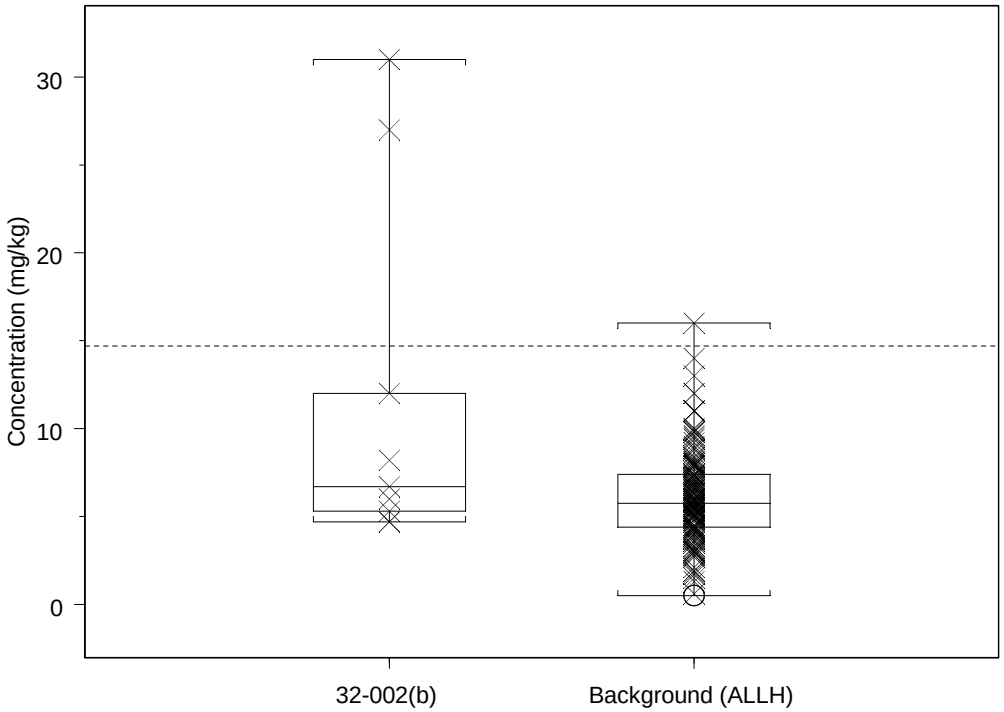


Figure F-5.3-3 Site concentrations of copper in soil at SWMU 32-002(b) compared to background

(× = detect, ○ = nondetect)

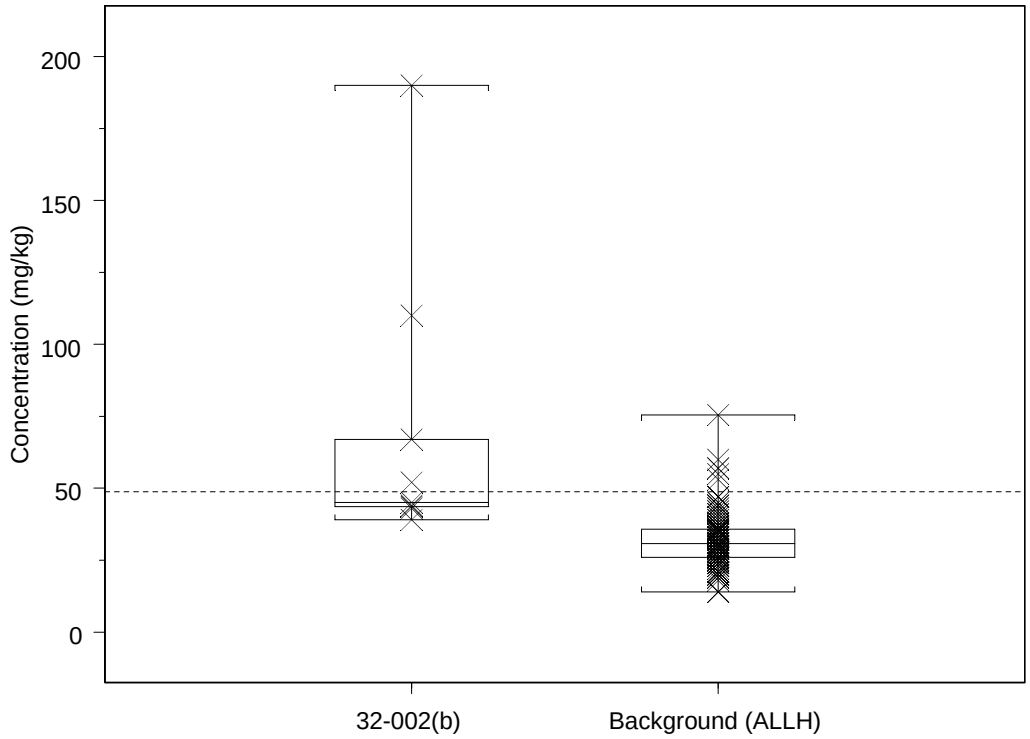


Figure F-5.3-4 Site concentrations of zinc in soil at SWMU 32-002(b) compared to background

(× = detect, ○ = nondetect)

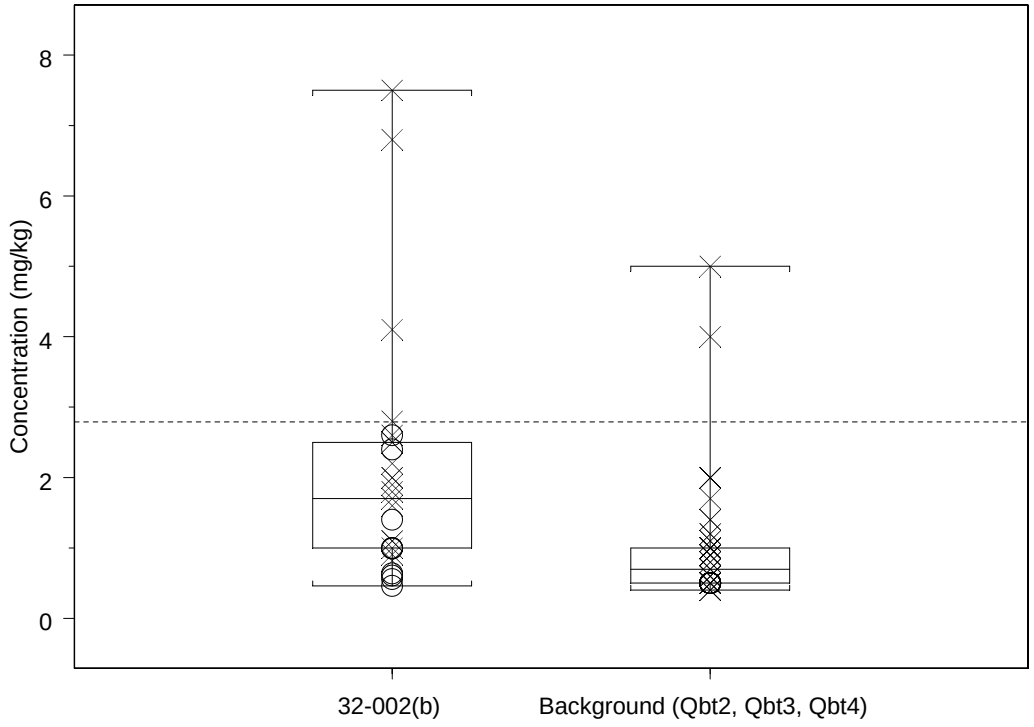


Figure F-5.3-5 Site concentrations of arsenic in tuff at SWMU 32-002(b) compared to background

(× = detect, ○ = nondetect)

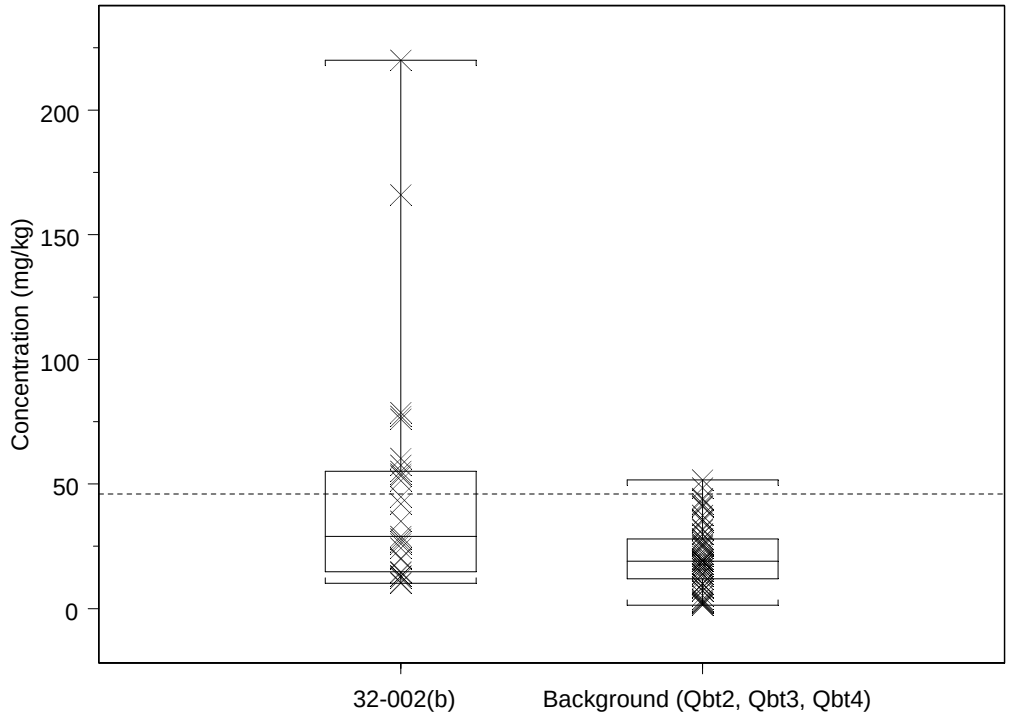


Figure F-5.3-6 Site concentrations of barium in tuff at SWMU 32-002(b) compared to background
(× = detect, ○ = nondetect)

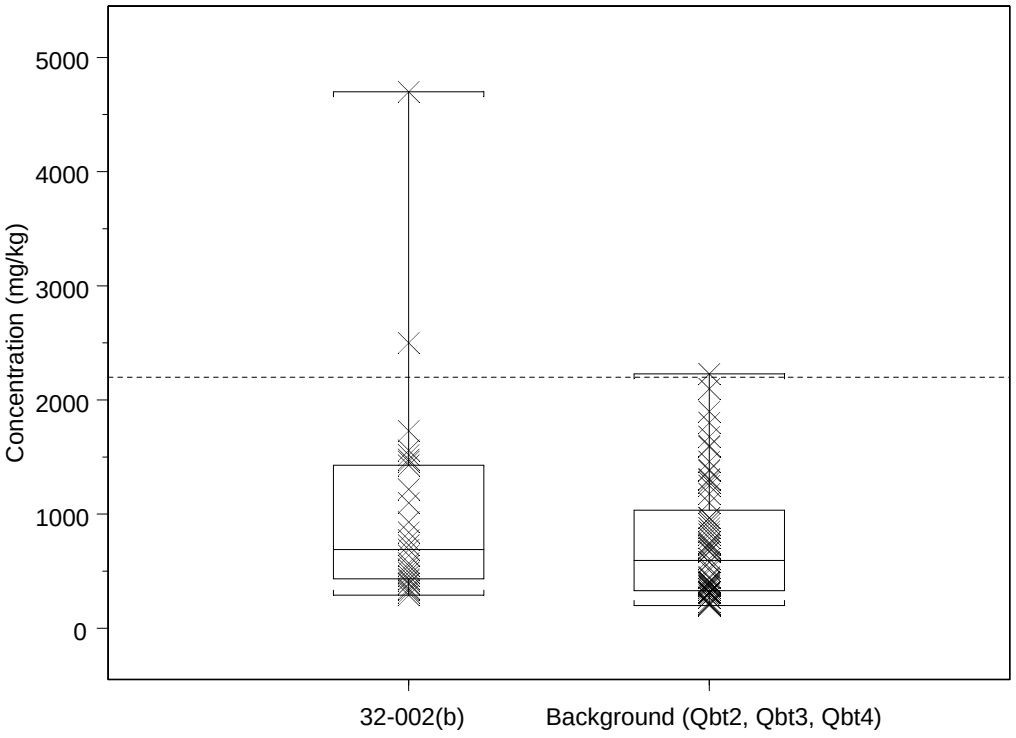


Figure F-5.3-7 Site concentrations of calcium in tuff at SWMU 32-002(b) compared to background
(× = detect, ○ = nondetect)

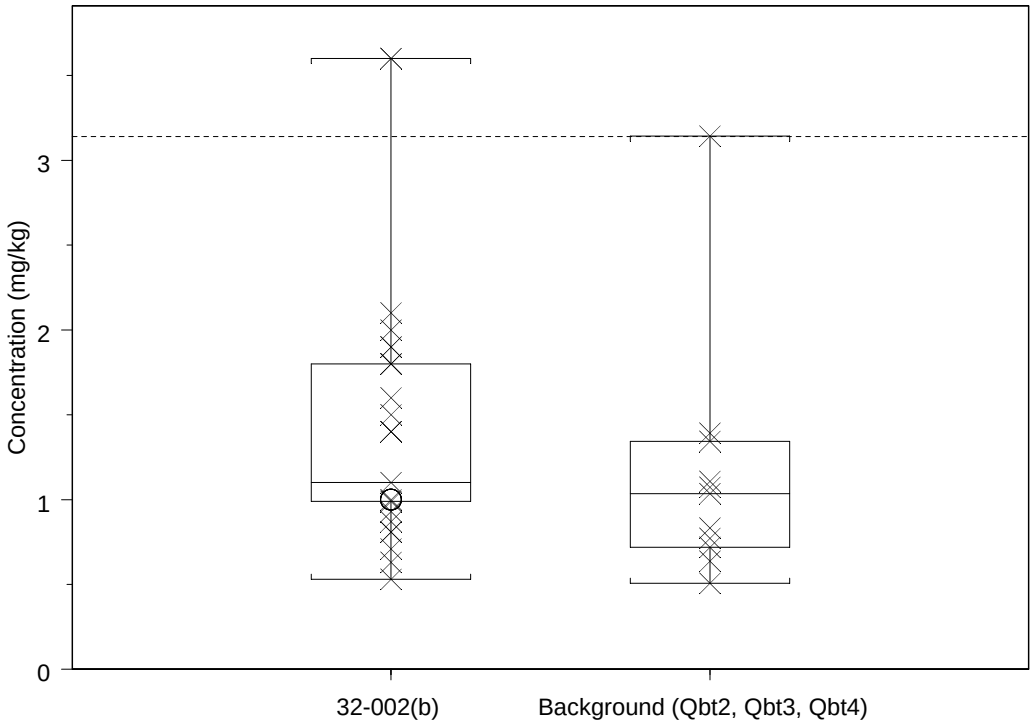


Figure F-5.3-8 Site concentrations of cobalt in tuff at SWMU 32-002(b) compared to background
(× = detect, ○ = nondetect)

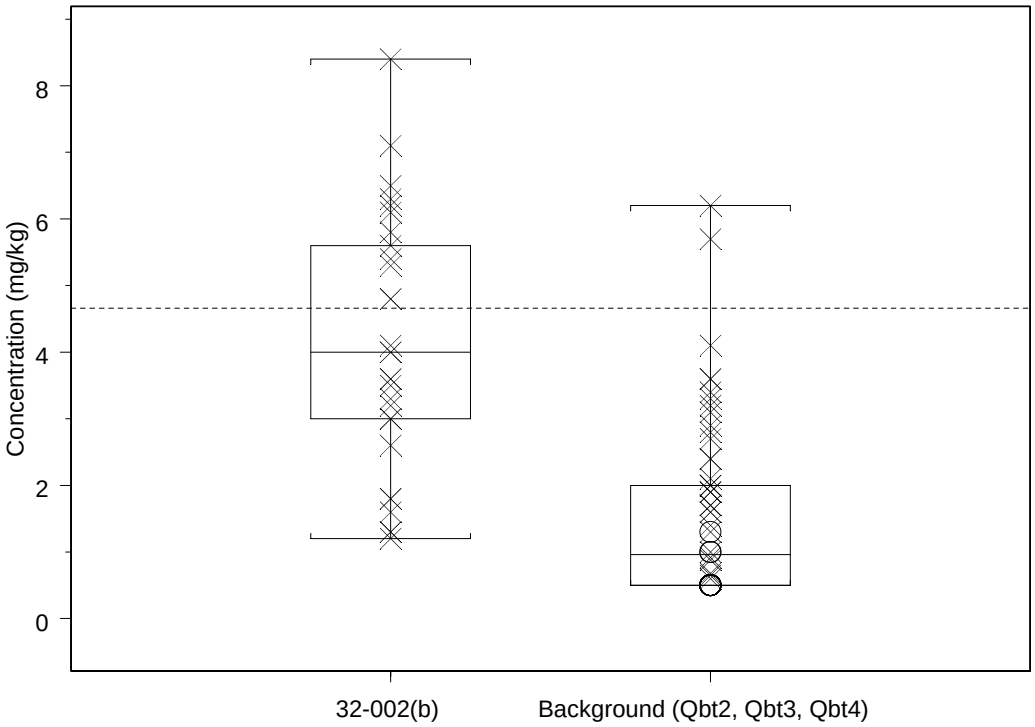


Figure F-5.3-9 Site concentrations of copper in tuff at SWMU 32-002(b) compared to background
(× = detect, ○ = nondetect)

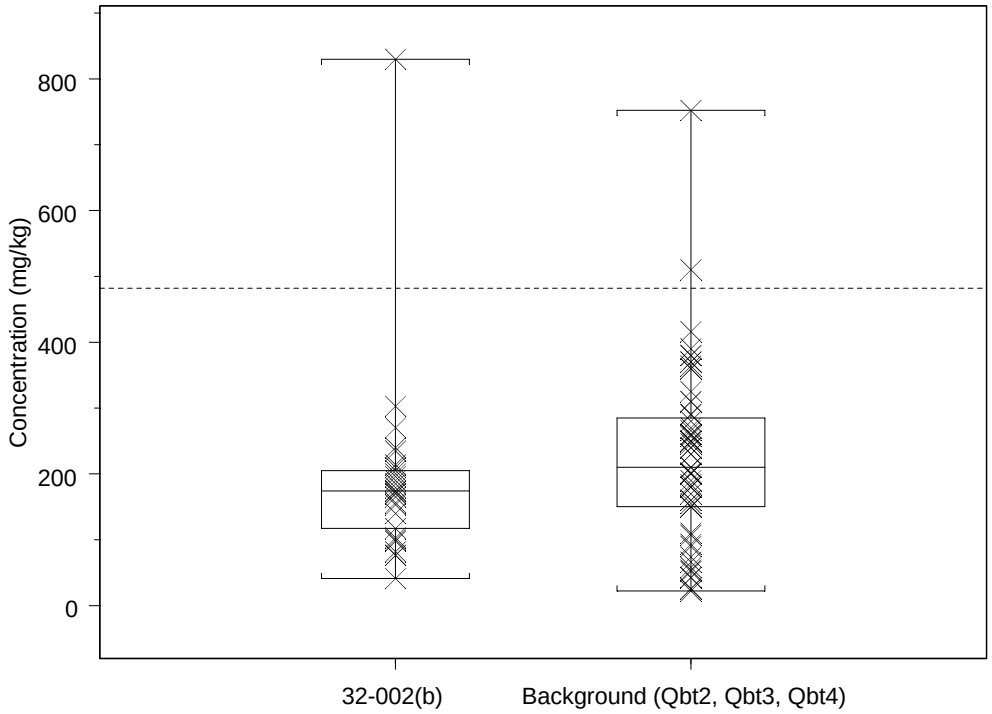


Figure F-5.3-10 Site concentrations of manganese in tuff at SWMU 32-002(b) compared to background

(× = detect, ○ = nondetect)

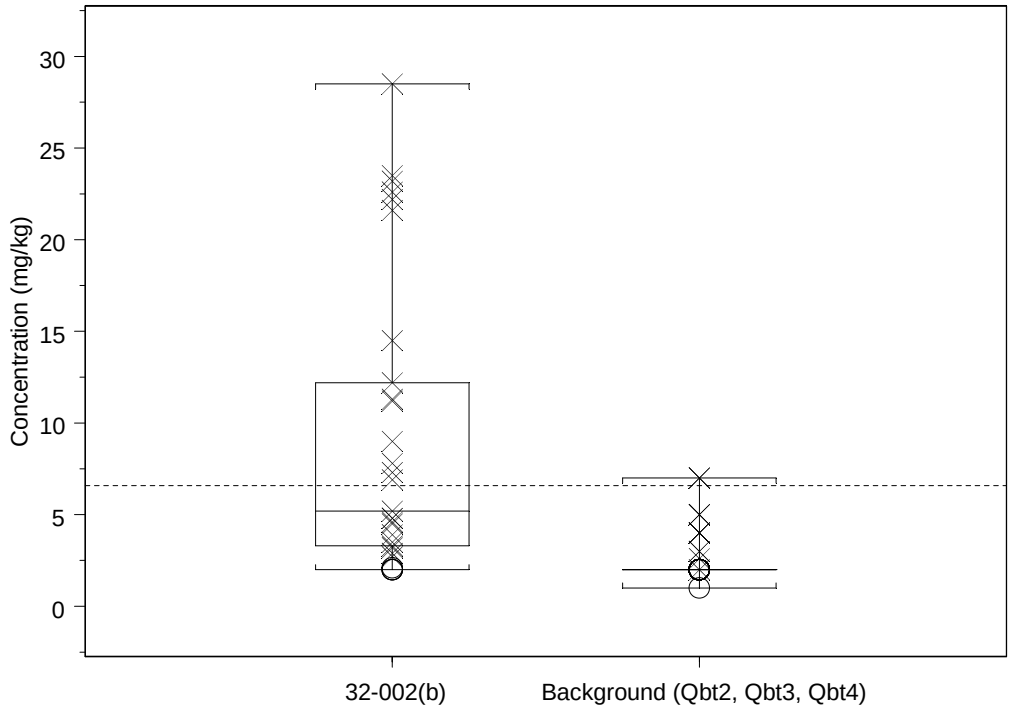


Figure F-5.3-11 Site concentrations of nickel in tuff at SWMU 32-002(b) compared to background

(× = detect, ○ = nondetect)

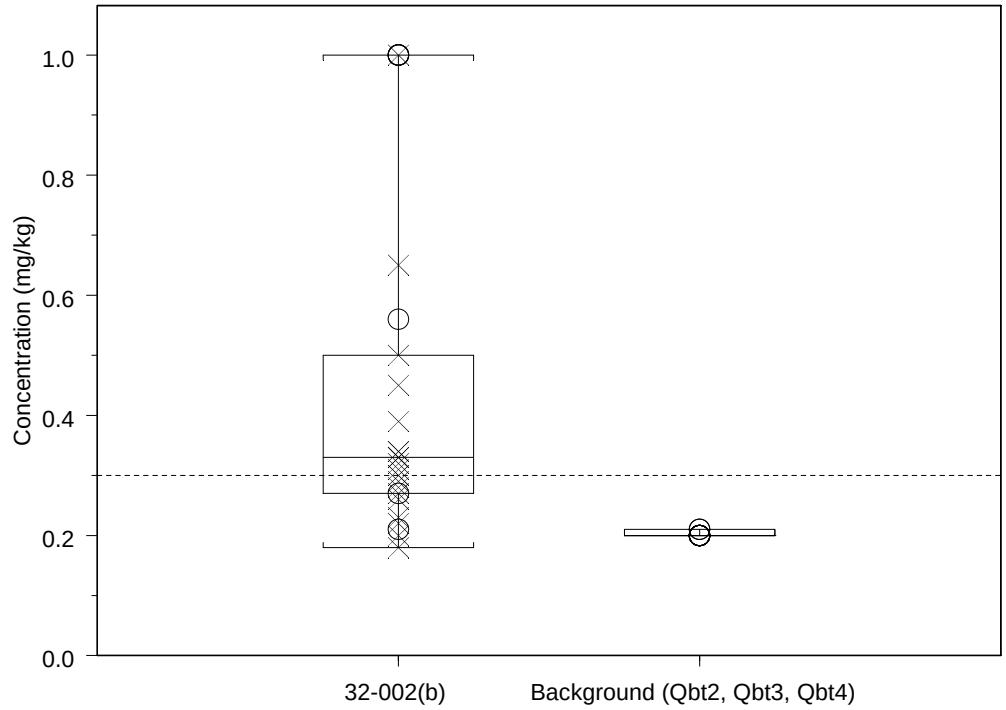


Figure F-5.3-12 Site concentrations of selenium in tuff at SWMU 32-002(b) compared to background

(× = detect, ○ = nondetect)

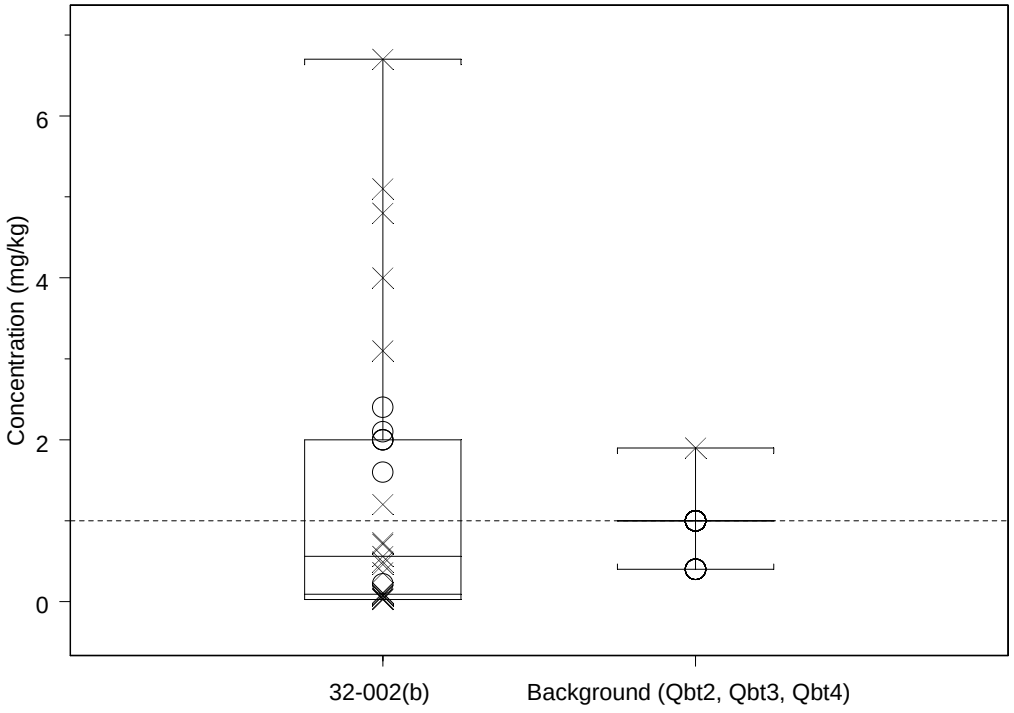


Figure F-5.3-13 Site concentrations of silver in tuff at SWMU 32-002(b) compared to background

(× = detect, ○ = nondetect)

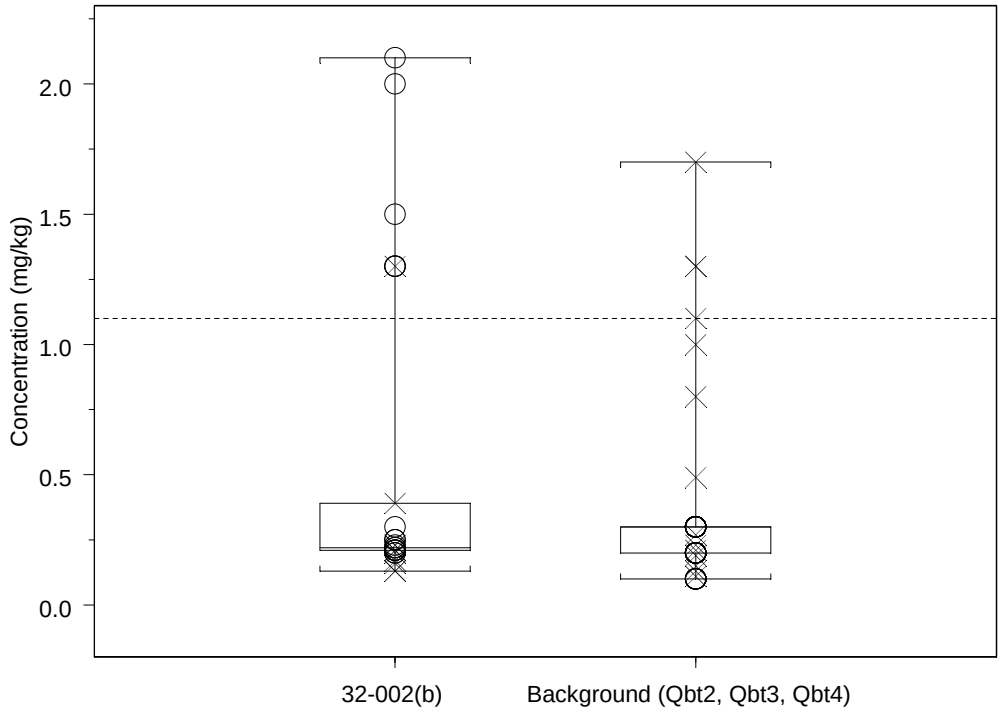


Figure F-5.3-14 Site concentrations of thallium in tuff at SWMU 32-002(b) compared to background

(× = detect, ○ = nondetect)

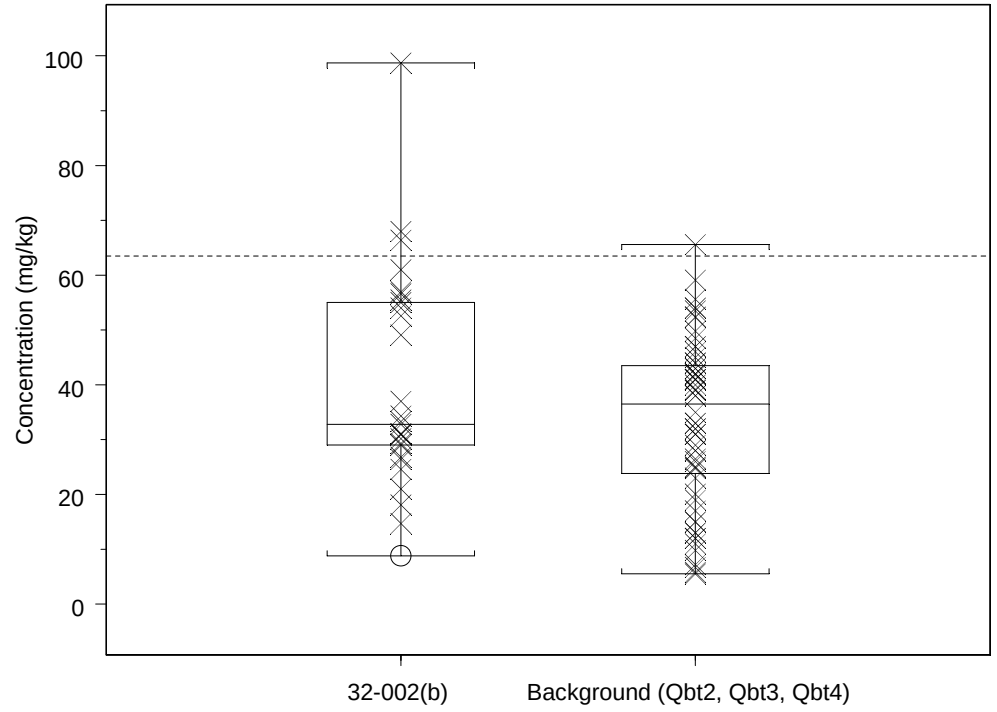


Figure F-5.3-15 Site concentrations of zinc in tuff at SWMU 32-002(b) compared to background

(× = detect, ○ = nondetect)

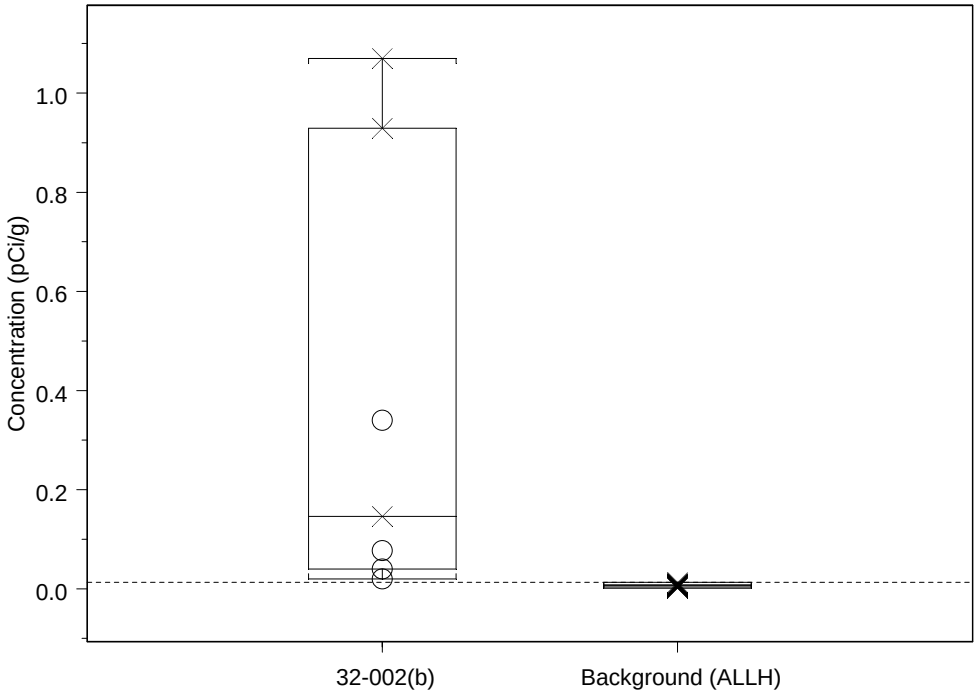


Figure F-5.3-16 Site concentrations of americium-241 in soil at SWMU 32-002(b) compared to background

(× = detect, ○ = nondetect)

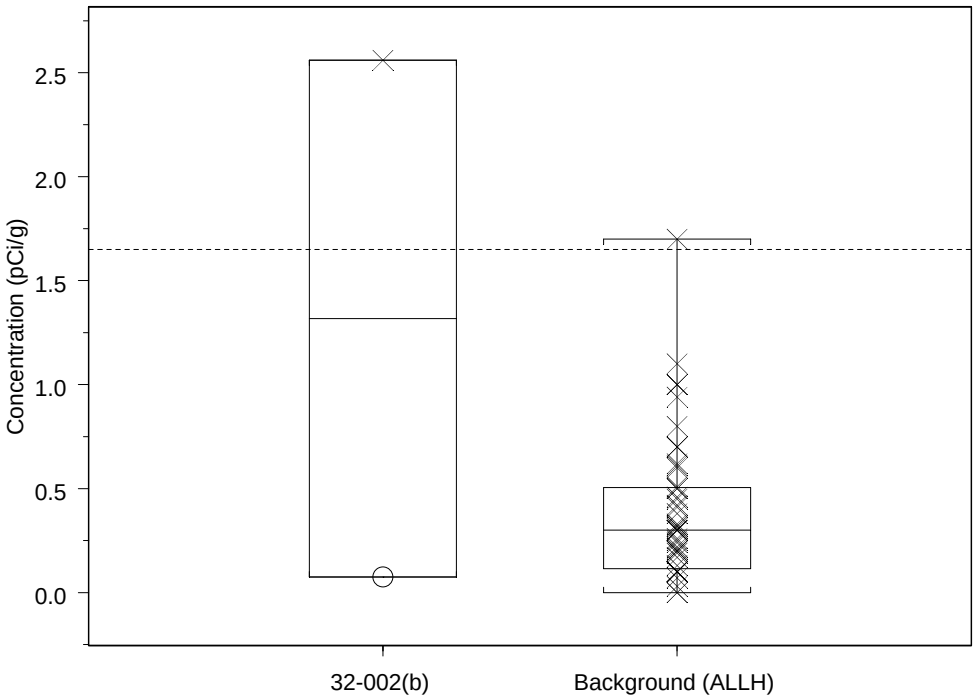


Figure F-5.3-17 Site concentrations of cesium-137 in soil at SWMU 32-002(b) compared to background

(× = detect, ○ = nondetect)

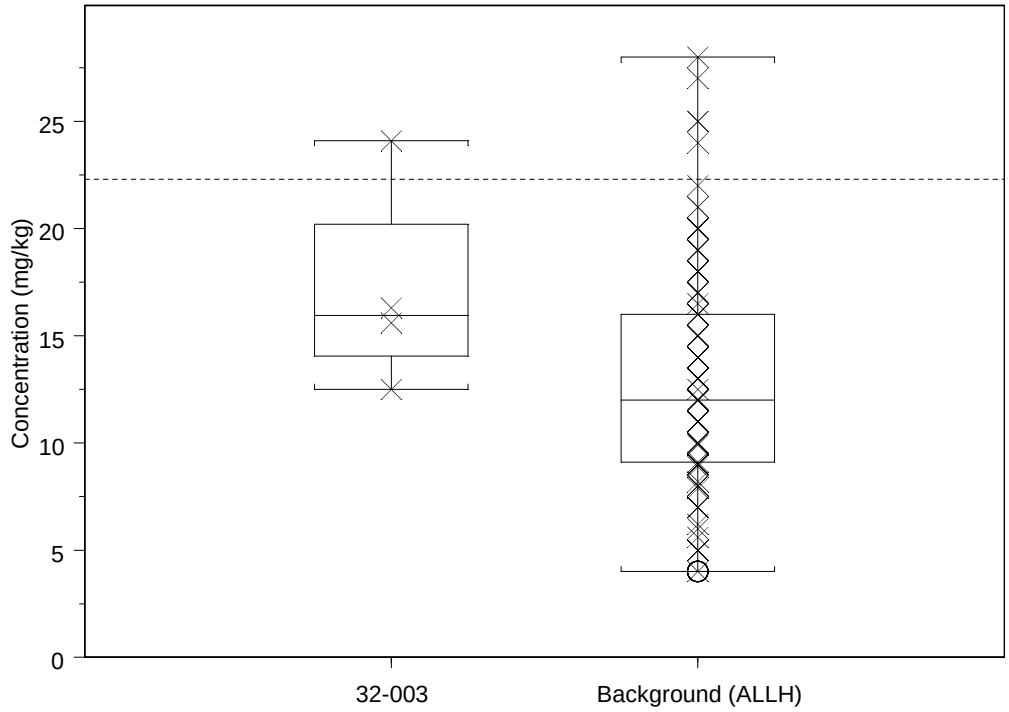


Figure F-5.4-1 Site concentrations of lead in soil at AOC 32-003 compared to background
(× = detect, ○ = nondetect)

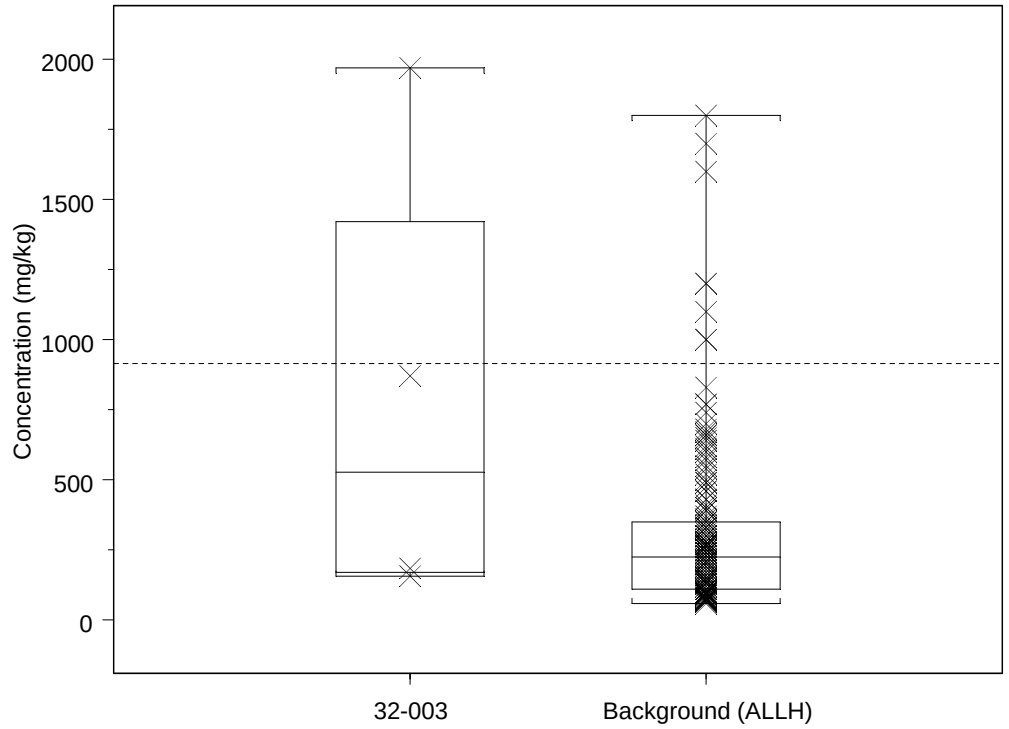


Figure F-5.4-2 Site concentrations of sodium in soil at AOC 32-003 compared to background
(× = detect, ○ = nondetect)

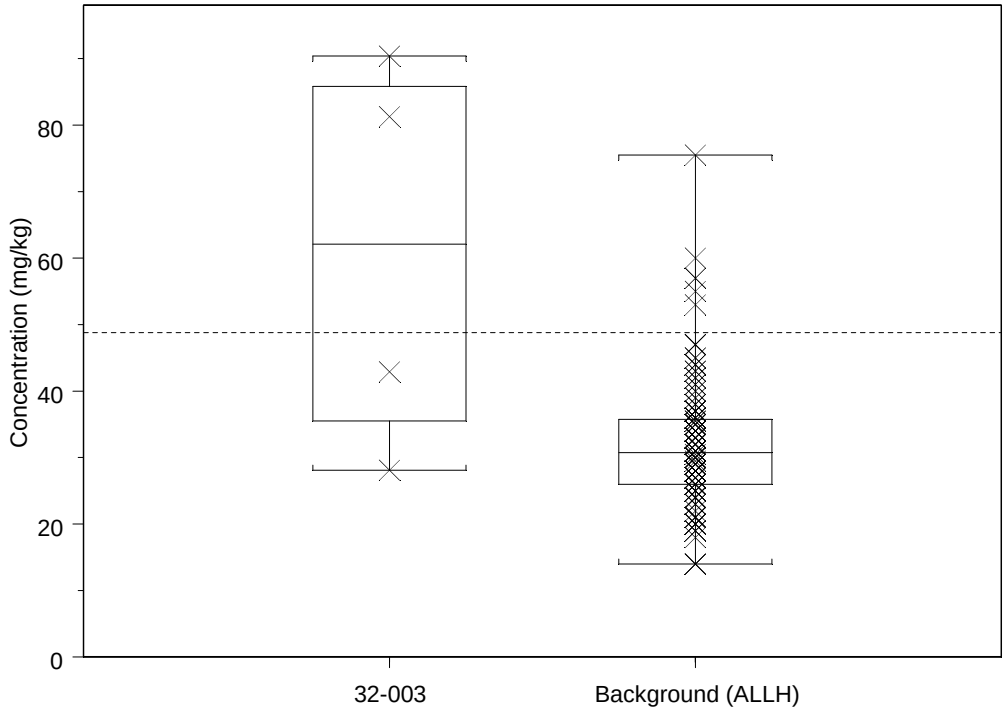


Figure F-5.4-3 Site concentrations of zinc in soil at AOC 32-003 compared to background
(× = detect, ○ = nondetect)

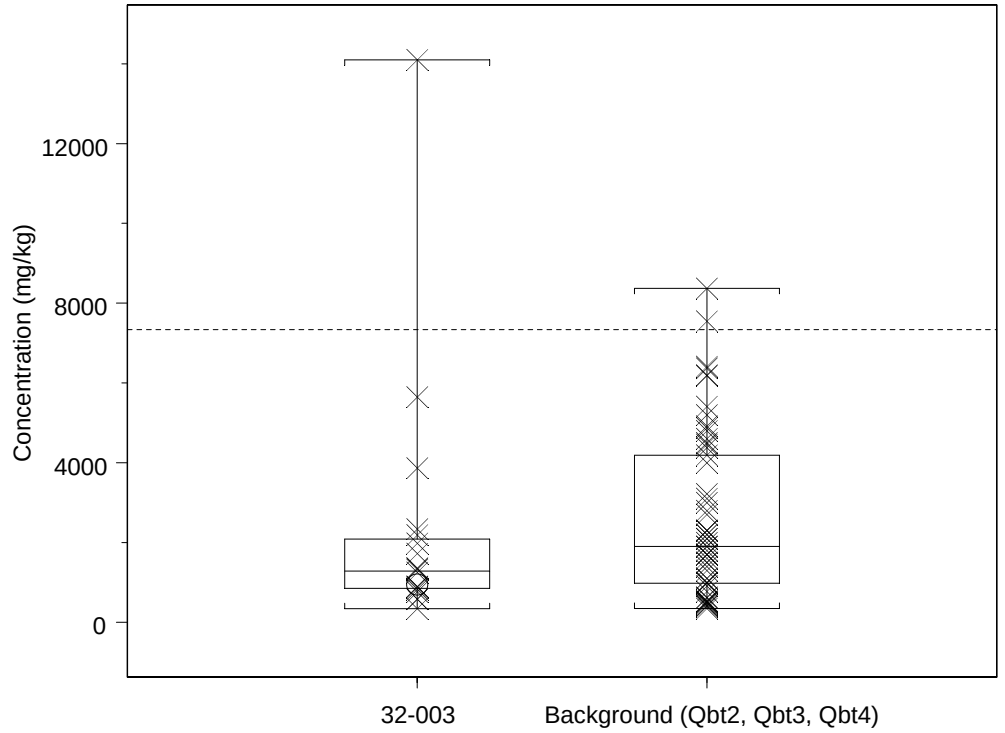


Figure F-5.4-4 Site concentrations of aluminum in tuff at AOC 32-003 compared to background
(× = detect, ○ = nondetect)

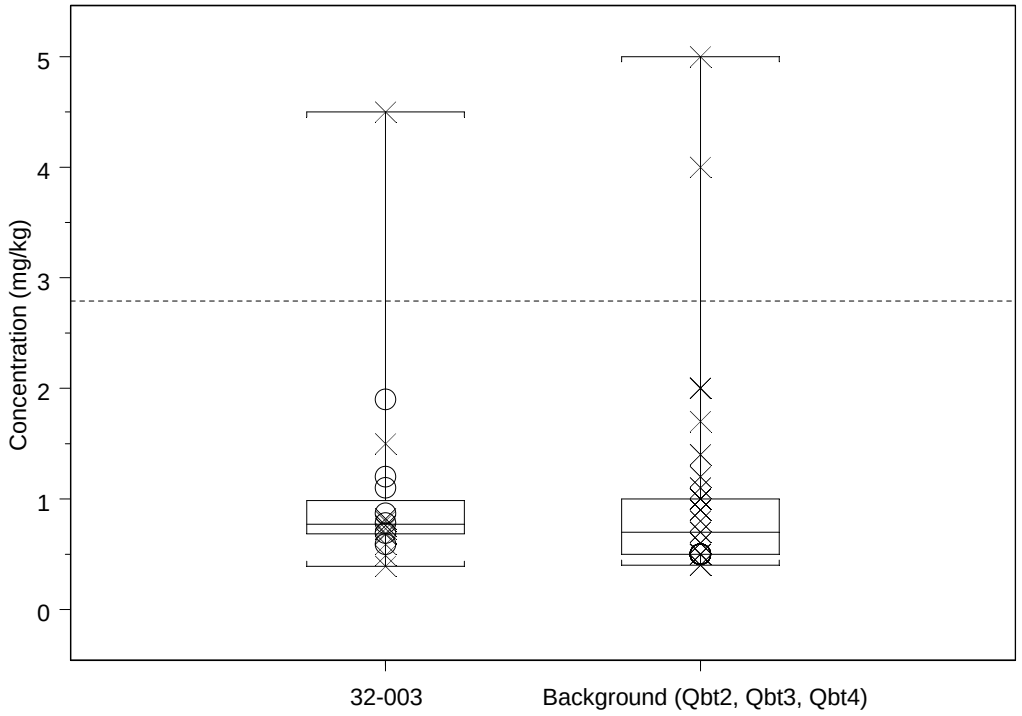


Figure F-5.4-5 Site concentrations of arsenic in tuff at AOC 32-003 compared to background
(× = detect, ○ = nondetect)

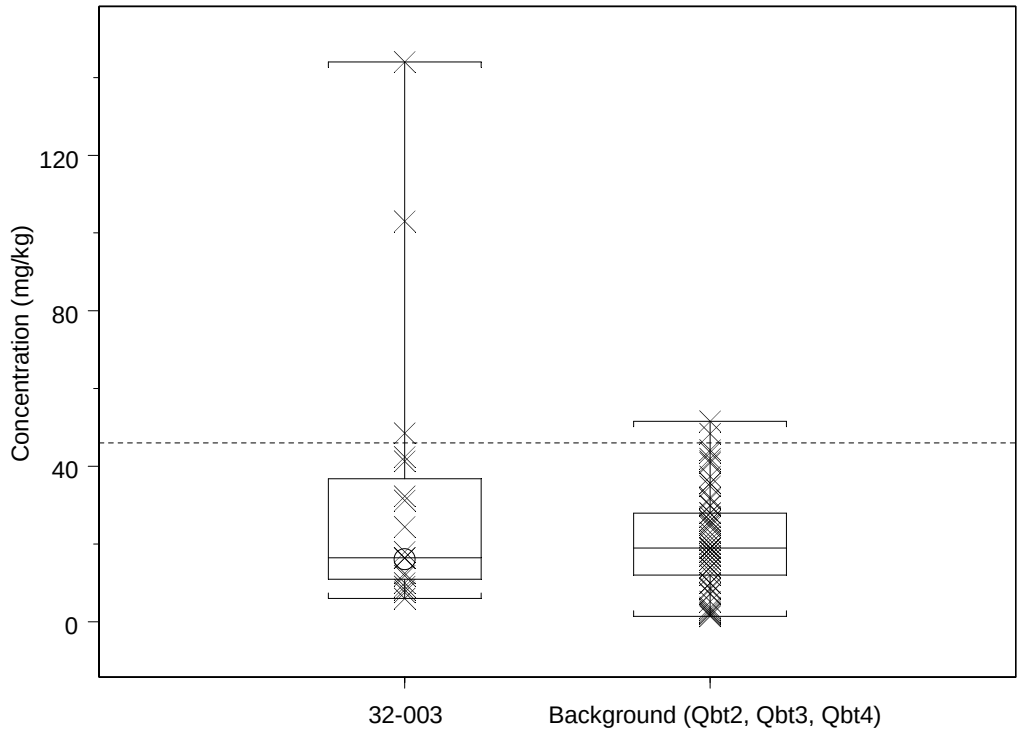


Figure F-5.4-6 Site concentrations of barium in tuff at AOC 32-003 compared to background
(× = detect, ○ = nondetect)

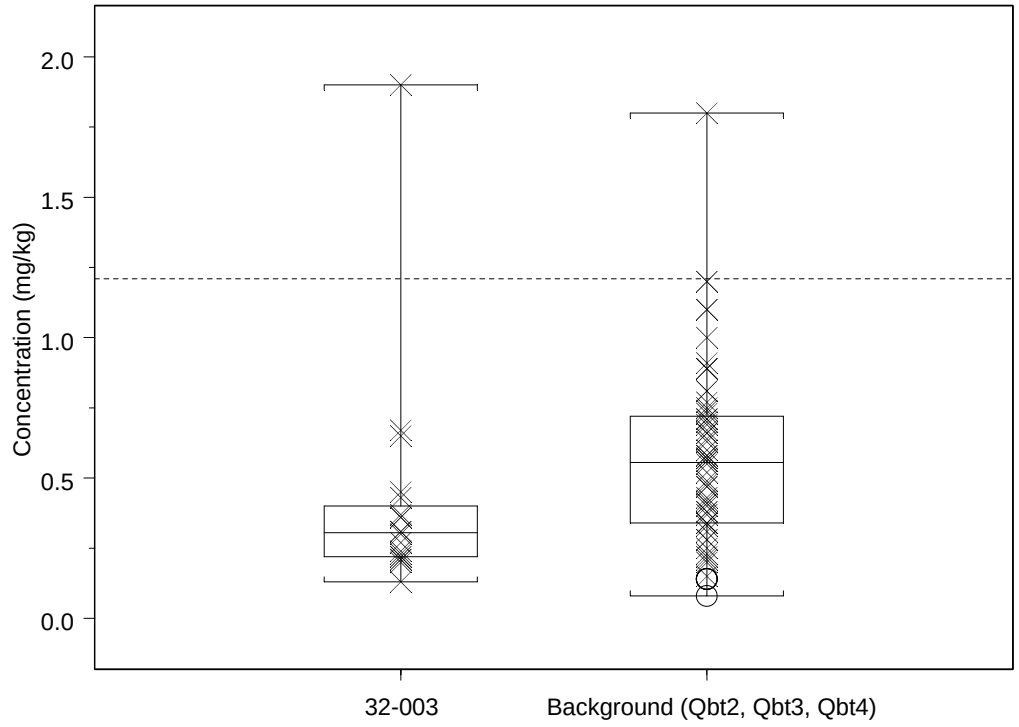


Figure F-5.4-7 Site concentrations of beryllium in tuff at AOC 32-003 compared to background
(× = detect, ○ = nondetect)

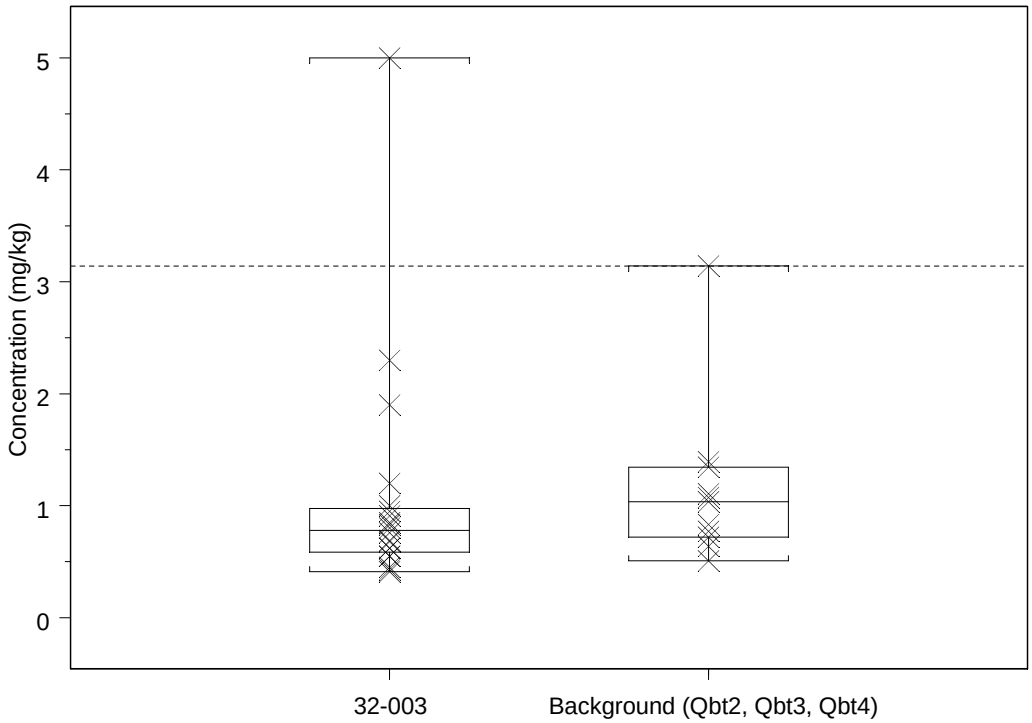


Figure F-5.4-8 Site concentrations of cobalt in tuff at AOC 32-003 compared to background
(× = detect, ○ = nondetect)

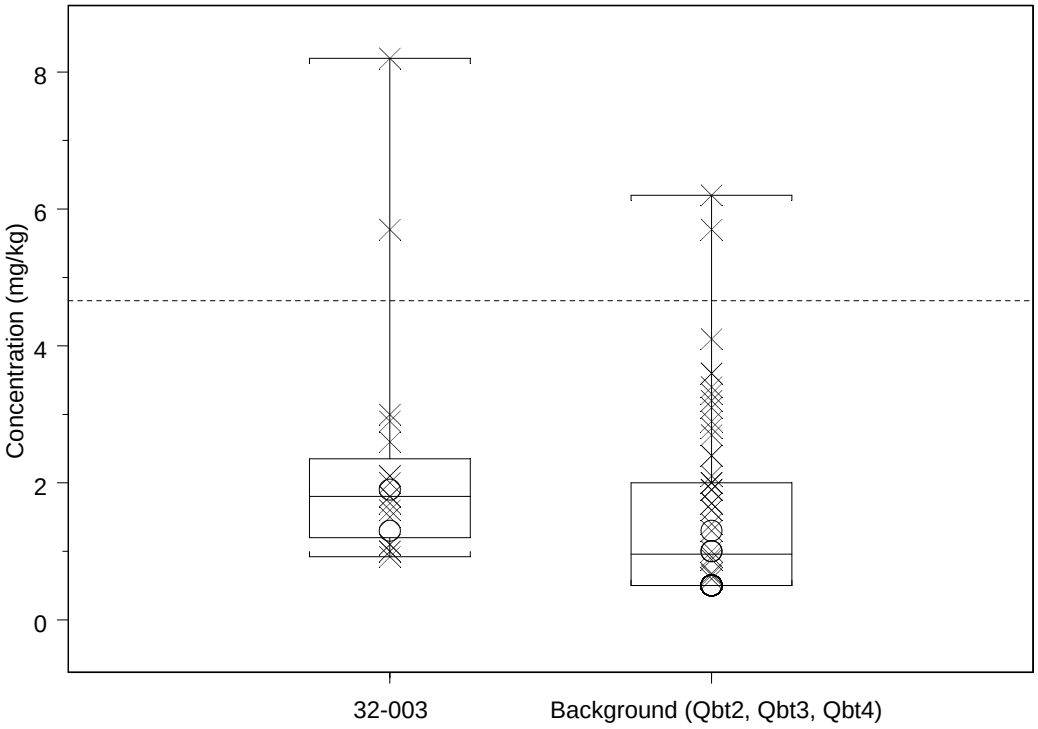


Figure F-5.4-9 Site concentrations of copper in tuff at AOC 32-003 compared to background
(× = detect, ○ = nondetect)

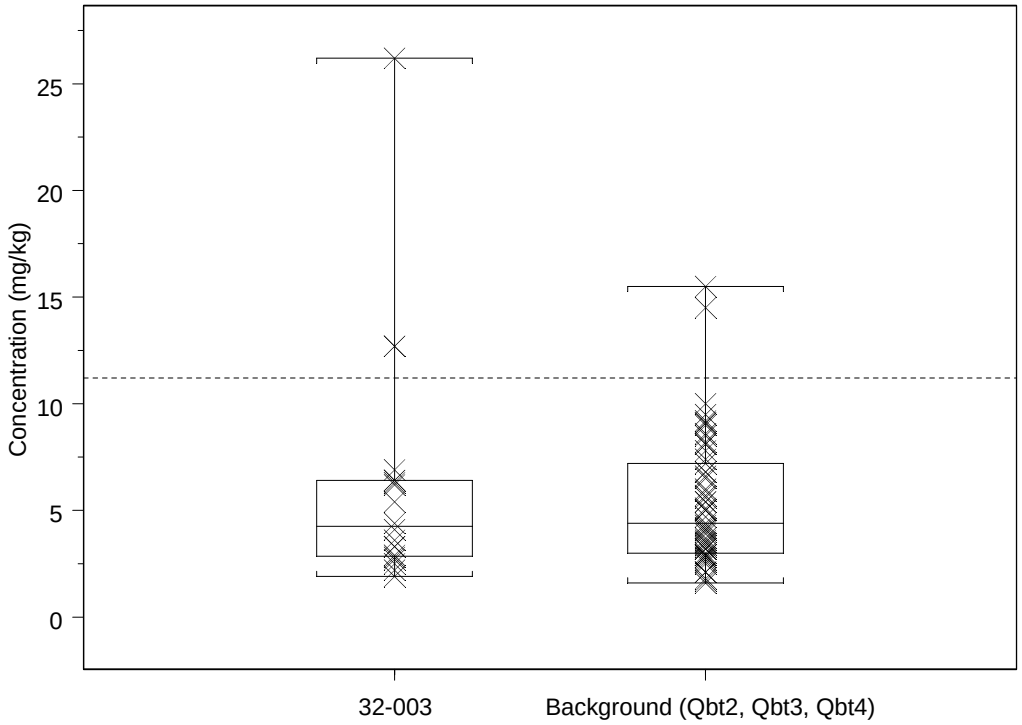


Figure F-5.4-10 Site concentrations of lead in tuff at AOC 32-003 compared to background
(× = detect, ○ = nondetect)

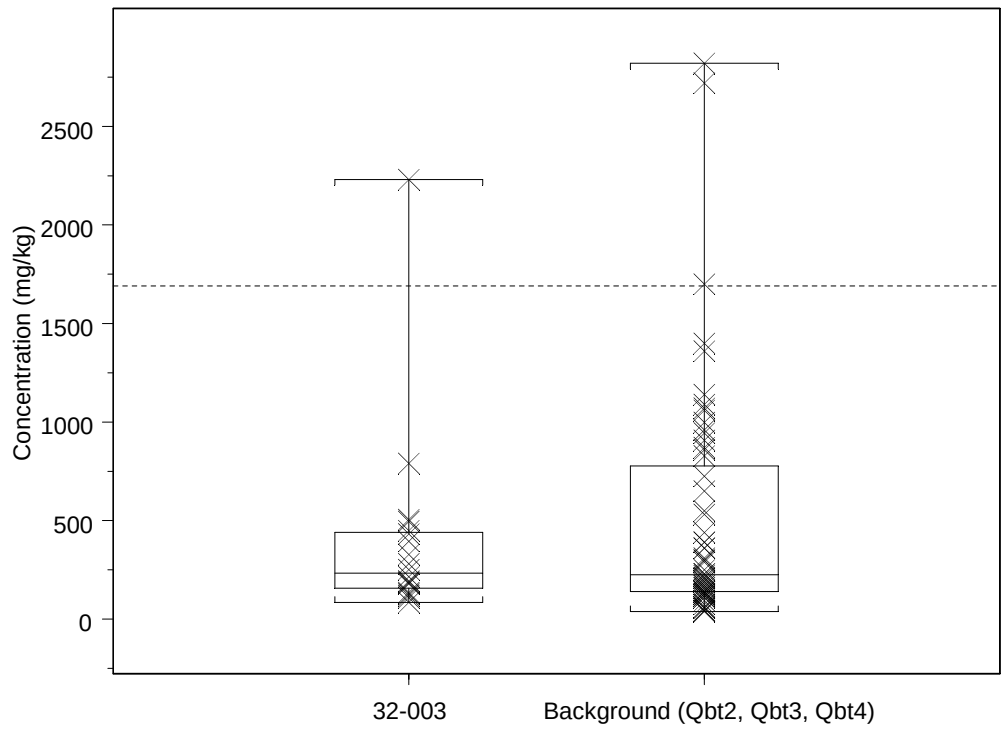


Figure F-5.4-11 Site concentrations of magnesium in tuff at AOC 32-003 compared to background
(× = detect, ○ = nondetect)

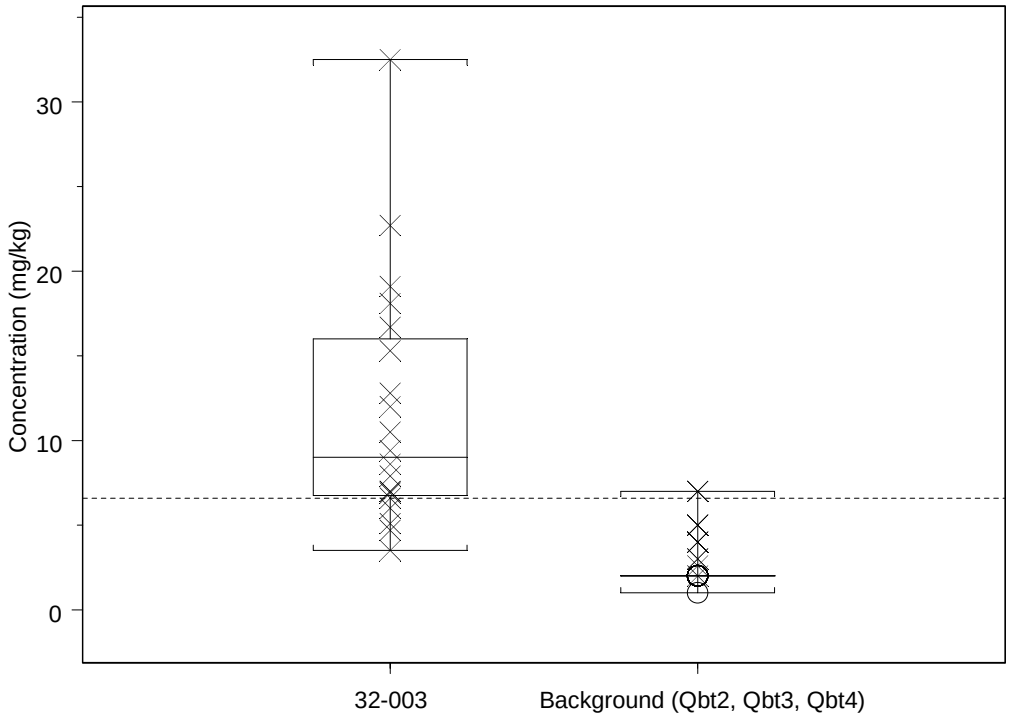


Figure F-5.4-12 Site concentrations of nickel in tuff at AOC 32-003 compared to background
(× = detect, ○ = nondetect)

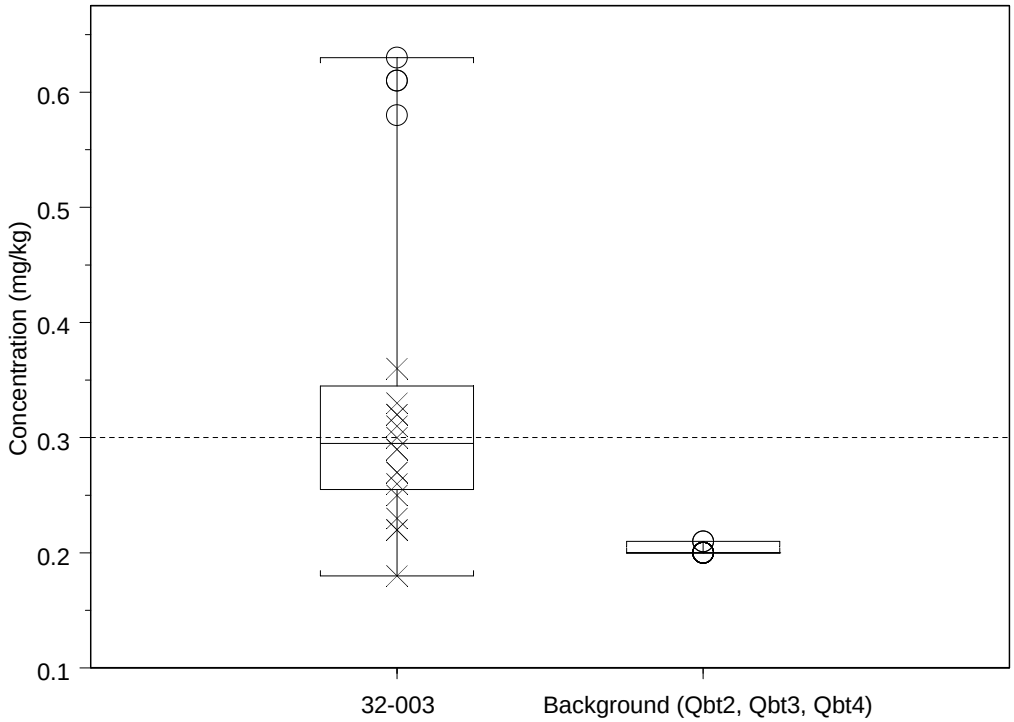


Figure F-5.4-13 Site concentrations of selenium in tuff at AOC 32-003 compared to background
(× = detect, ○ = nondetect)

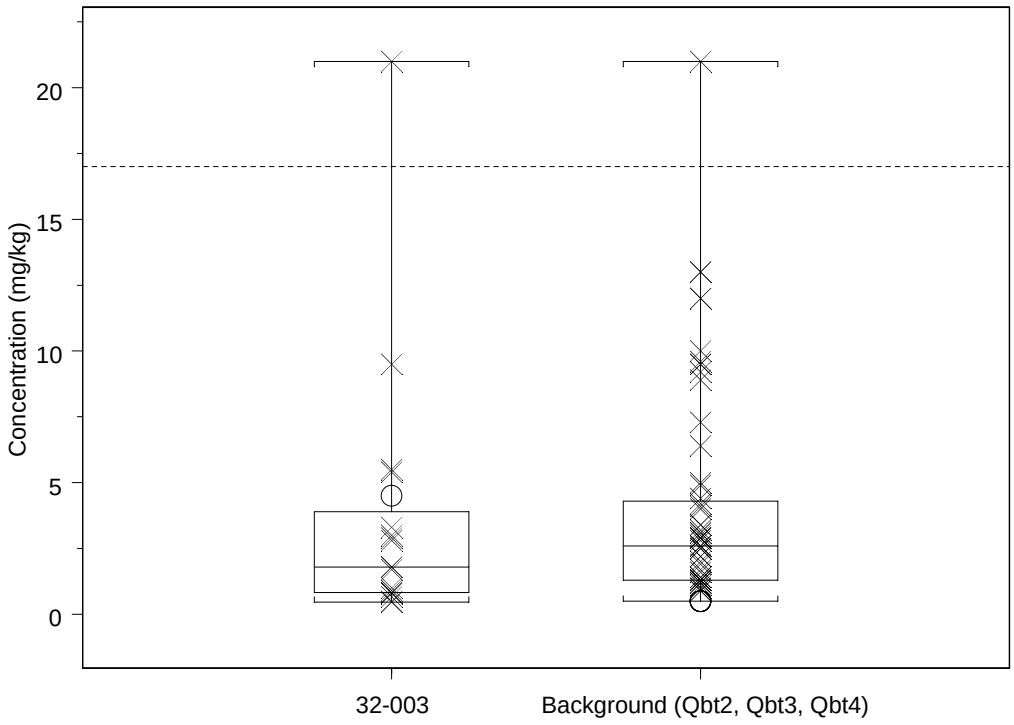


Figure F-5.4-14 Site concentrations of vanadium in tuff at AOC 32-003 compared to background
(× = detect, ○ = nondetect)

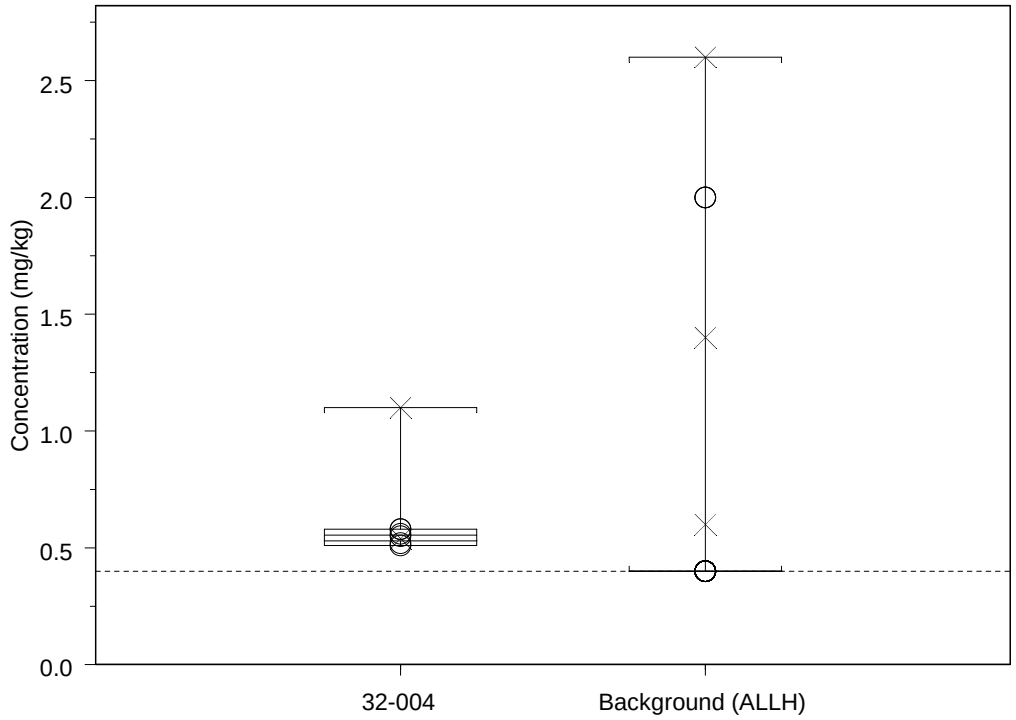


Figure F-5.5-1 Site concentrations of cadmium in soil at AOC 32-004 compared to background
(× = detect, ○ = nondetect)

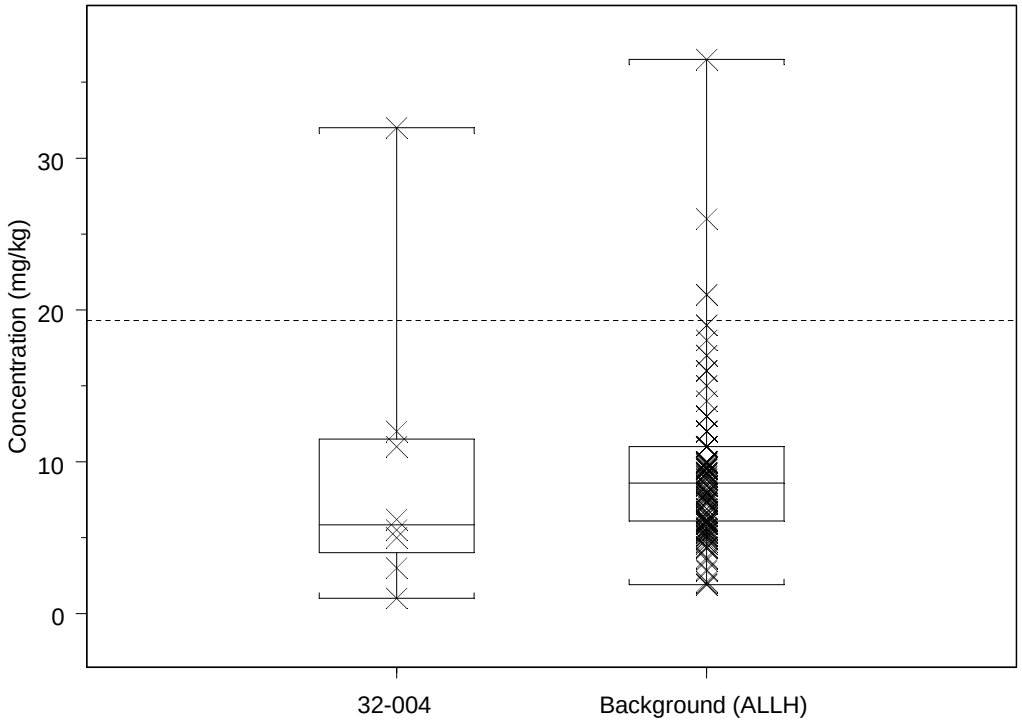


Figure F-5.5-2 Site concentrations of chromium in soil at AOC 32-004 compared to background
(× = detect, ○ = nondetect)

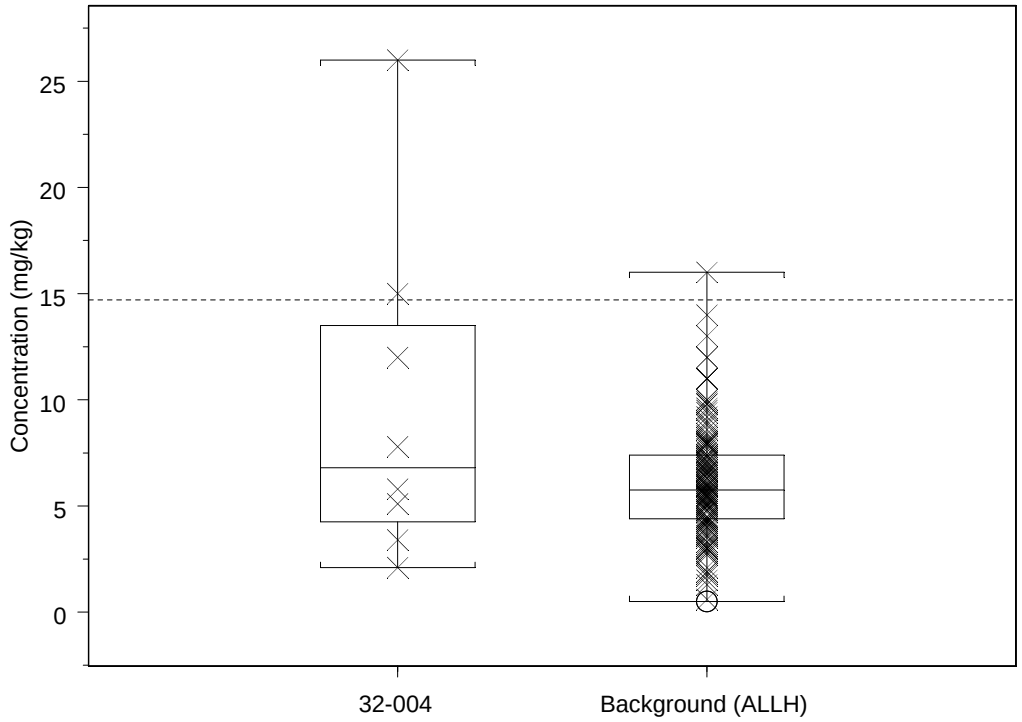


Figure F-5.5-3 Site concentrations of copper in soil at AOC 32-004 compared to background
(× = detect, ○ = nondetect)

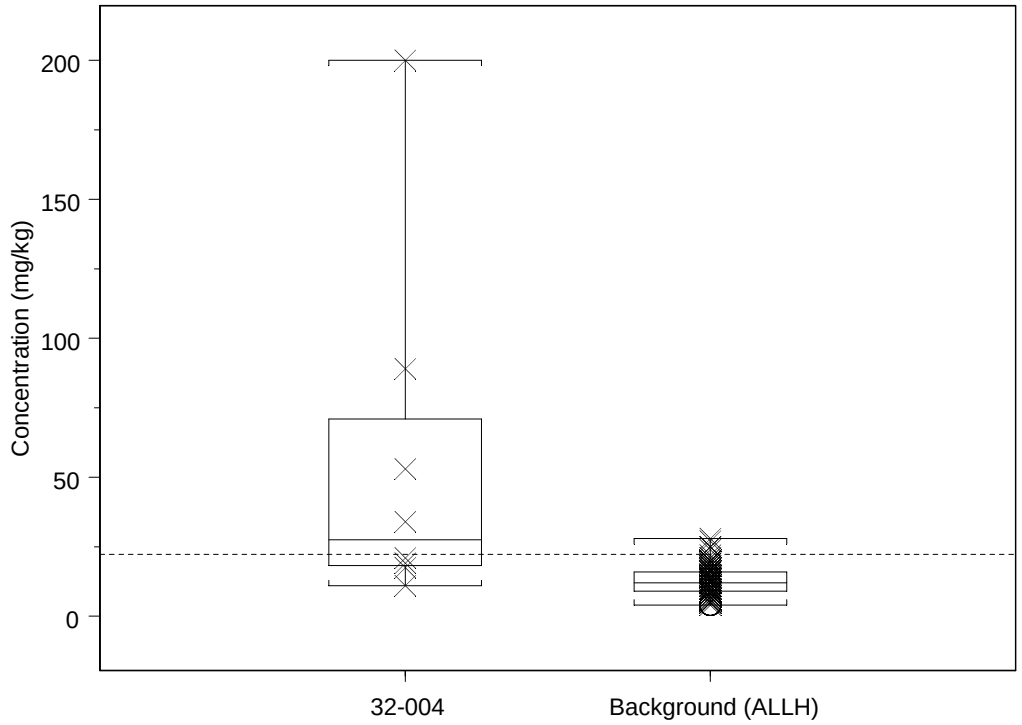


Figure F-5.5-4 Site concentrations of lead in soil at AOC 32-004 compared to background
(× = detect, ○ = nondetect)

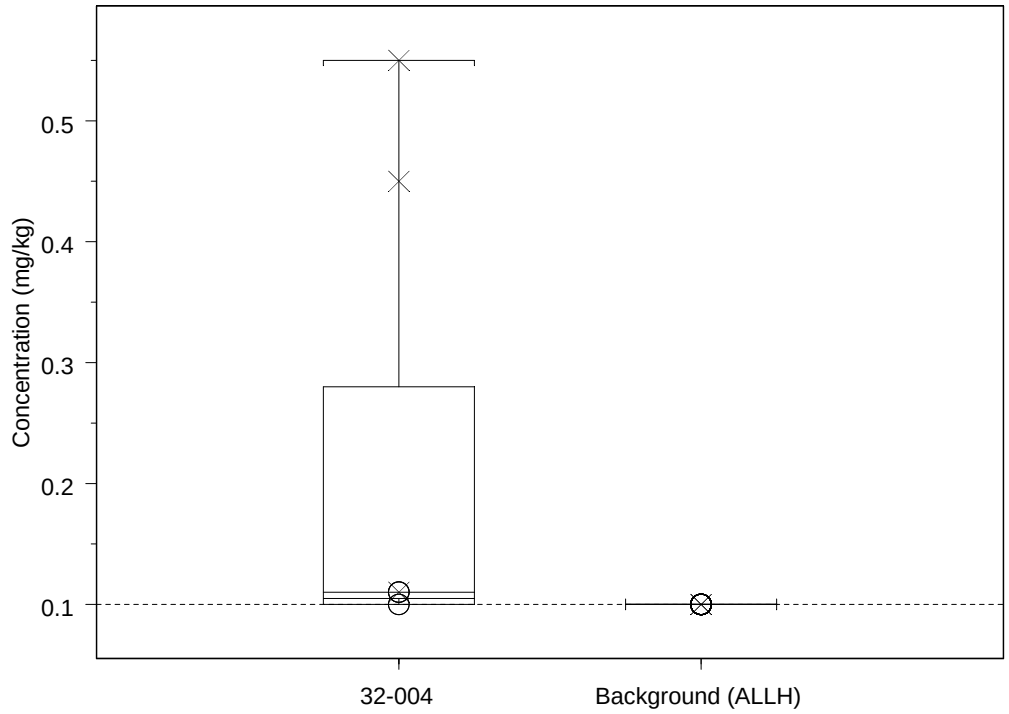


Figure F-5.5-5 Site concentrations of mercury in soil at AOC 32-004 compared to background
(× = detect, ○ = nondetect)

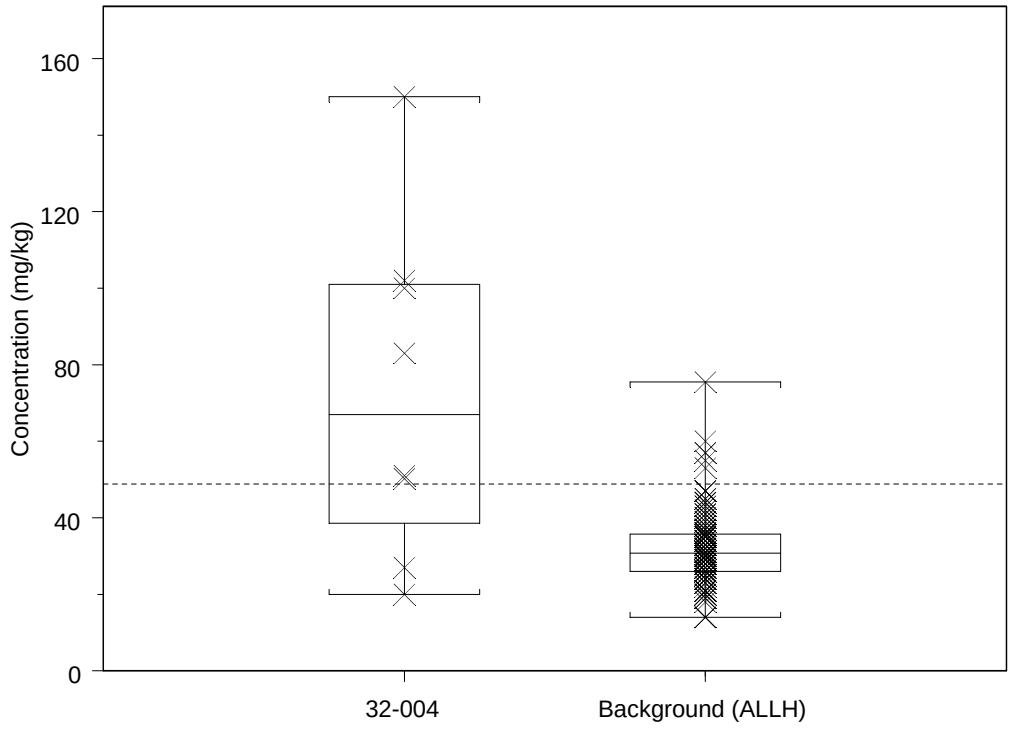


Figure F-5.5-6 Site concentrations of zinc in soil at AOC 32-004 compared to background
(× = detect, ○ = nondetect)

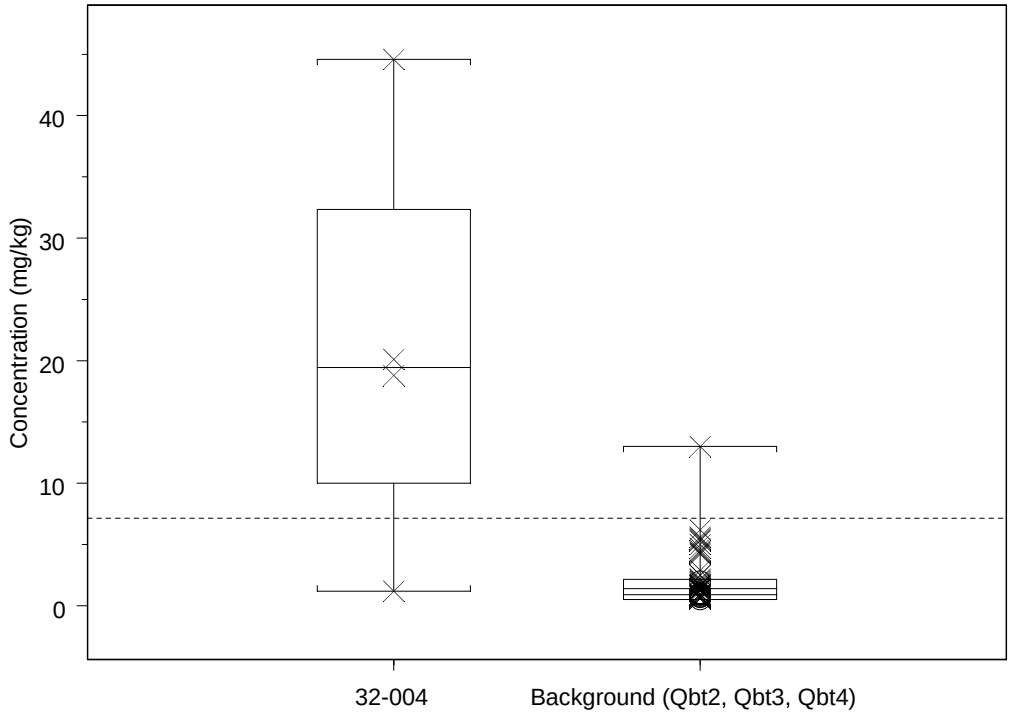


Figure F-5.5-7 Site concentrations of chromium in tuff at AOC 32-004 compared to background
(× = detect, ○ = nondetect)

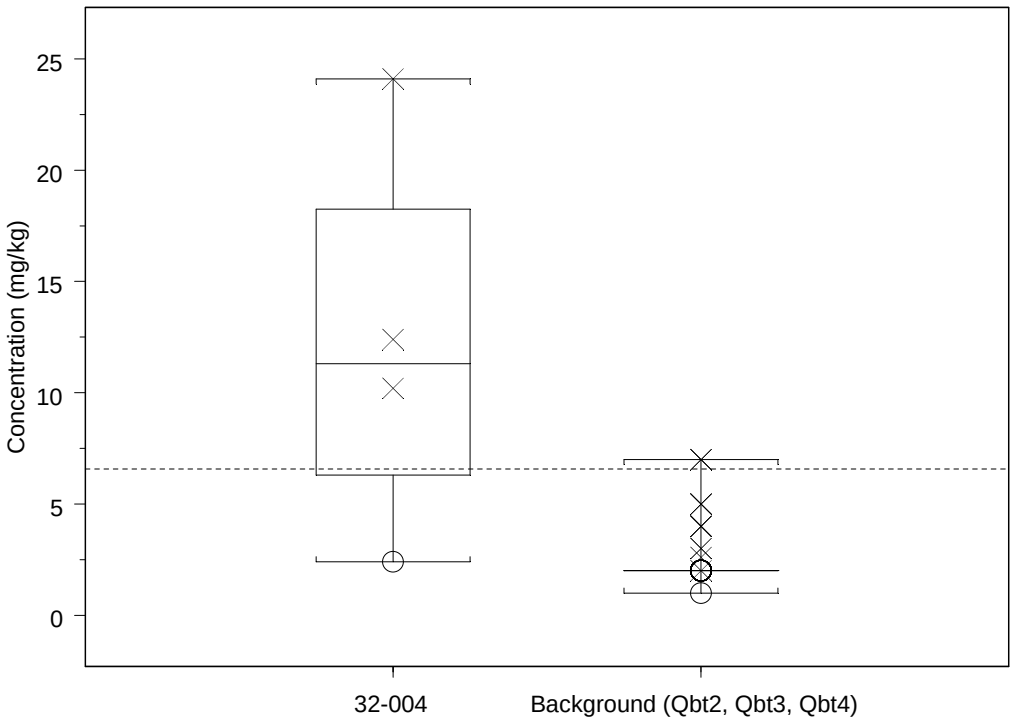


Figure F-5.5-8 Site concentrations of nickel in tuff at AOC 32-004 compared to background
(× = detect, ○ = nondetect)



Figure F-5.5-9 Site concentrations of selenium in tuff at AOC 32-004 compared to background
(× = detect, ○ = nondetect)

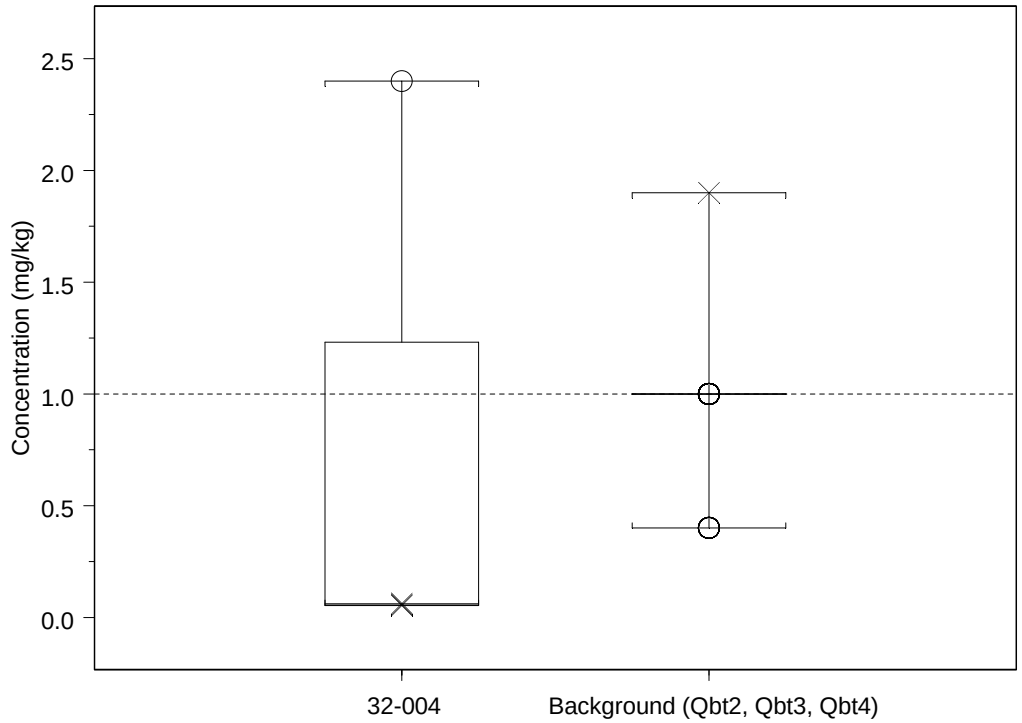


Figure F-5.5-10 Site concentrations of silver in tuff at AOC 32-004 compared to background
(× = detect, ○ = nondetect)

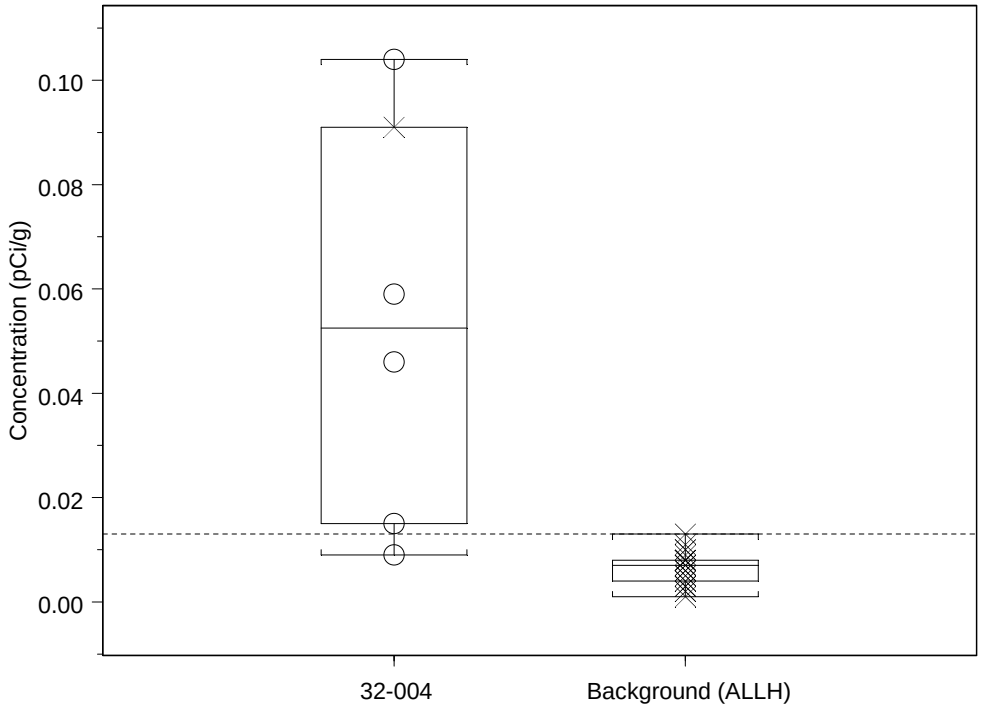


Figure F-5.5-11 Site concentrations of americium-241 in soil at AOC 32-004 compared to background

(× = detect, ○ = nondetect)

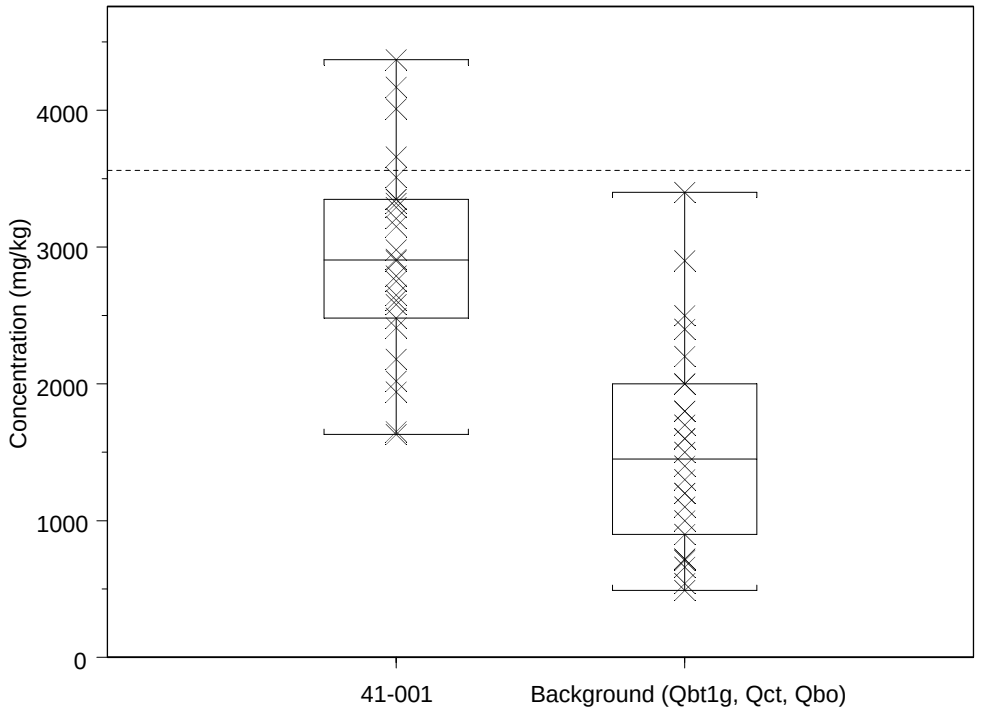


Figure F-6.1-1 Site concentrations of aluminum in tuff at SWMU 41-001 compared to background

(× = detect, ○ = nondetect)

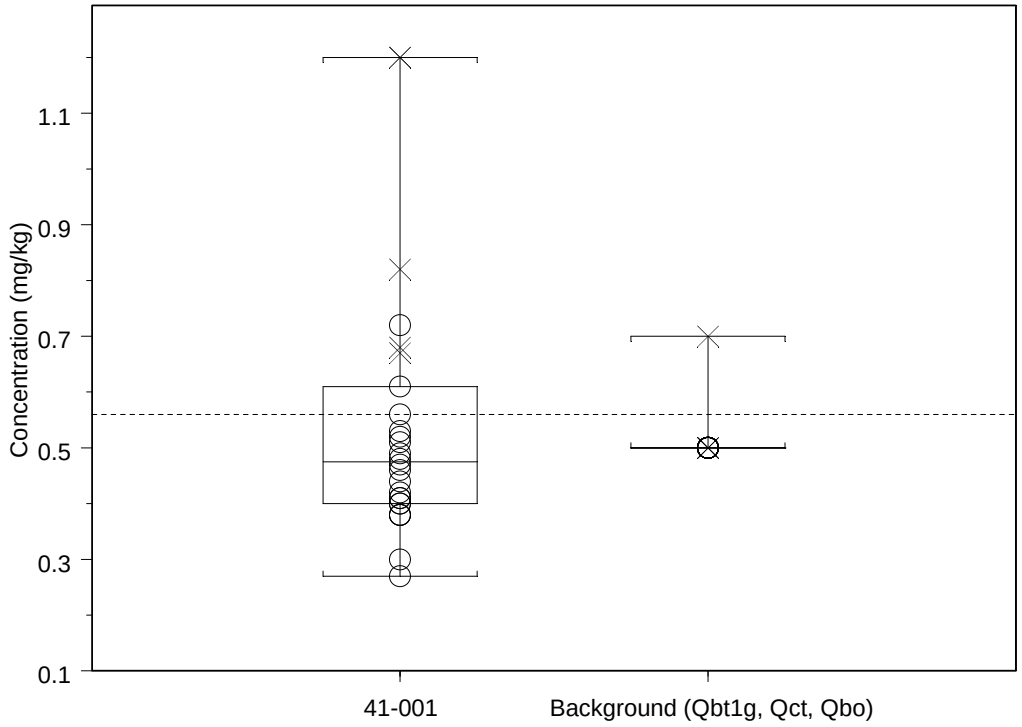


Figure F-6.1-2 Site concentrations of aluminum in tuff at SWMU 41-001 compared to background
(× = detect, ○ = nondetect)

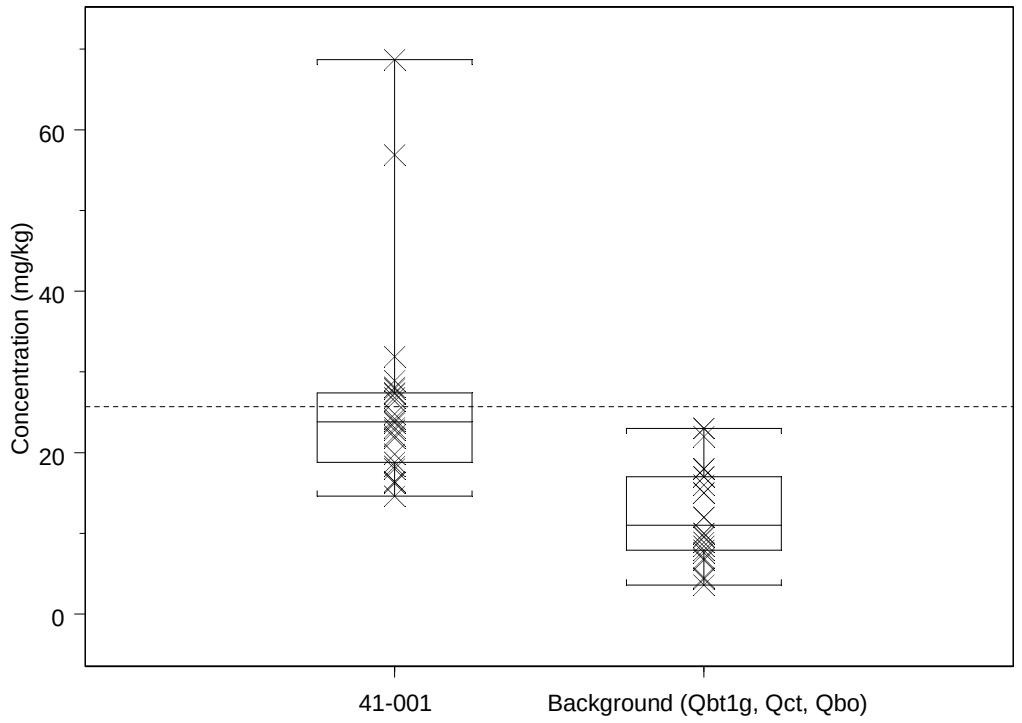


Figure F-6.1-3 Site concentrations of barium in tuff at SWMU 41-001 compared to background
(× = detect, ○ = nondetect)

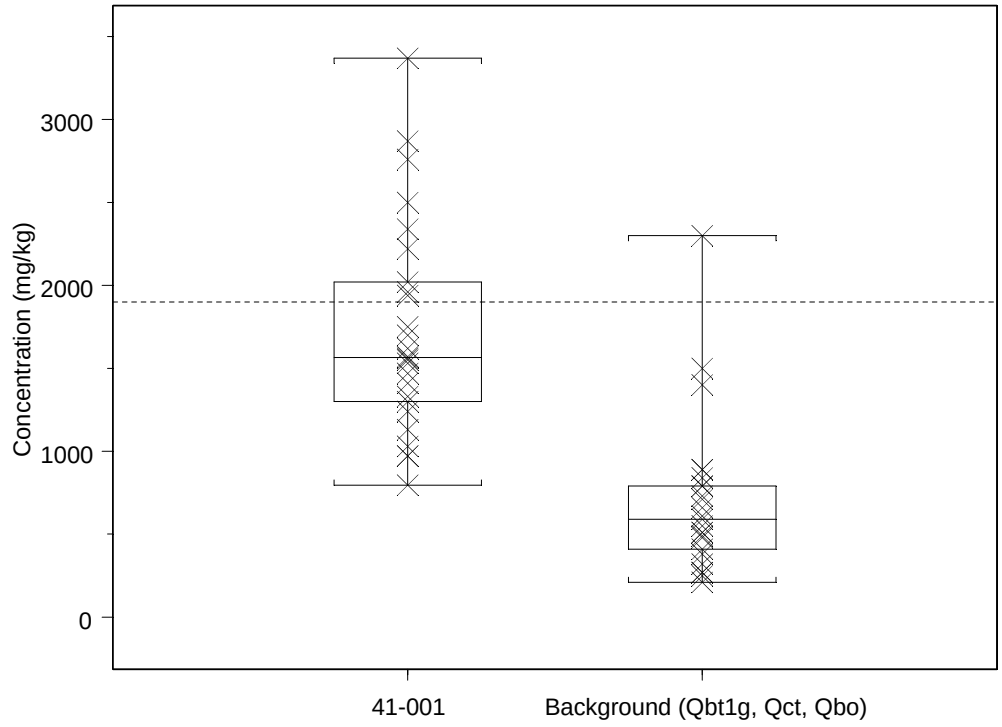


Figure F-6.1-4 Site concentrations of calcium in tuff at SWMU 41-001 compared to background

(× = detect, ○ = nondetect)

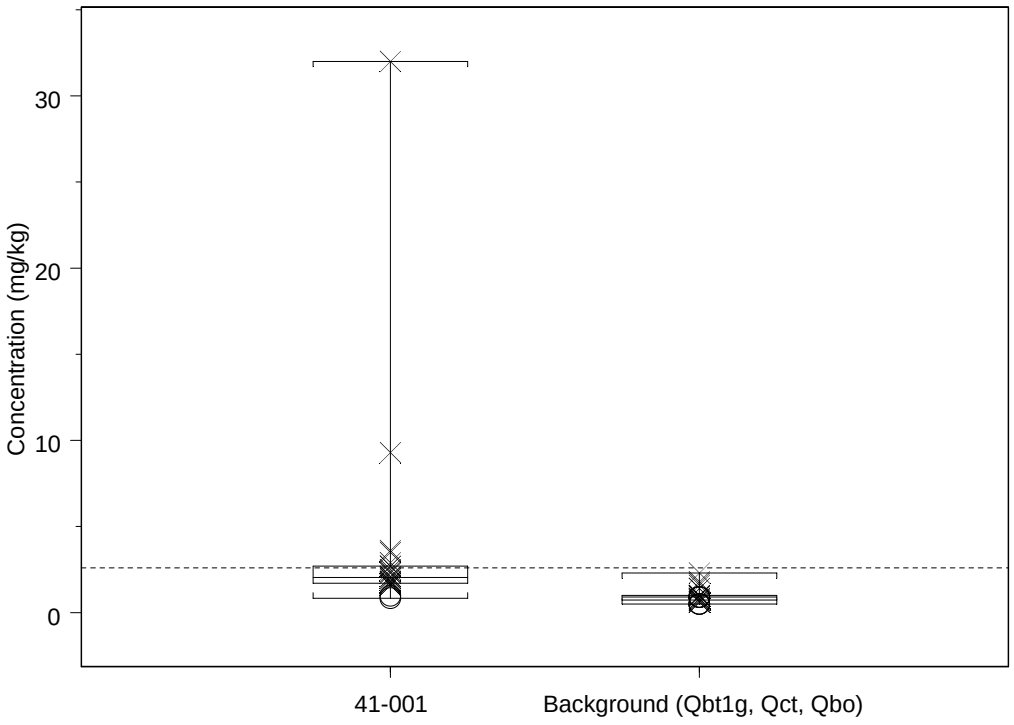


Figure F-6.1-5 Site concentrations of chromium in tuff at SWMU 41-001 compared to background

(× = detect, ○ = nondetect)

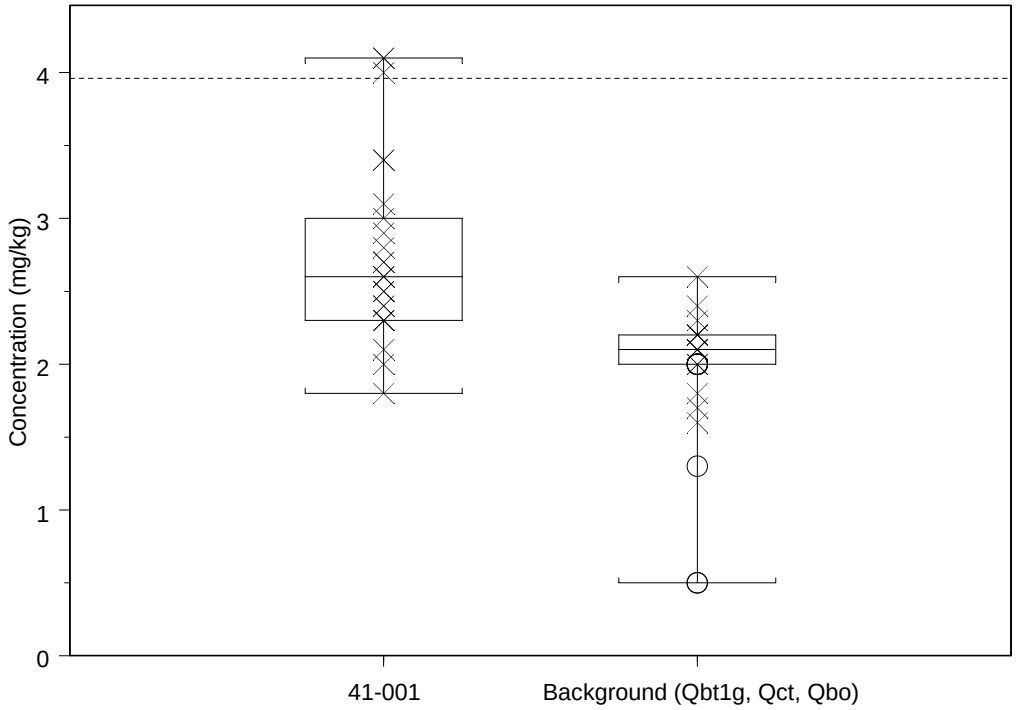


Figure F-6.1-6 Site concentrations of copper in tuff at SWMU 41-001 compared to background
(× = detect, ○ = nondetect)

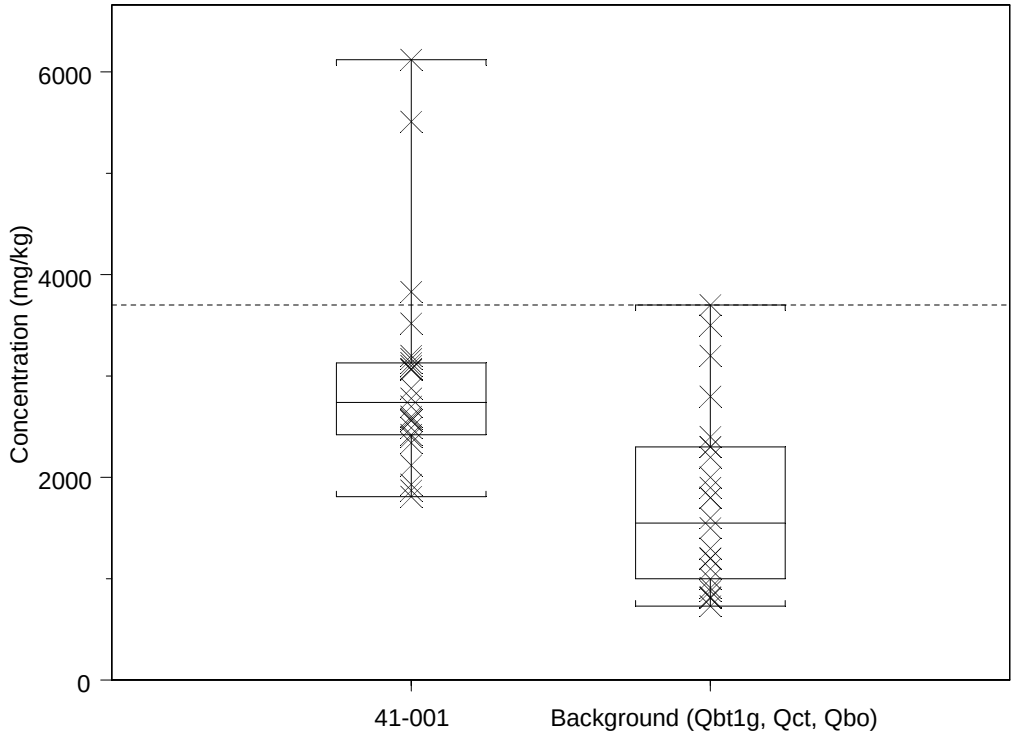


Figure F-6.1-7 Site concentrations of iron in tuff at SWMU 41-001 compared to background
(× = detect, ○ = nondetect)

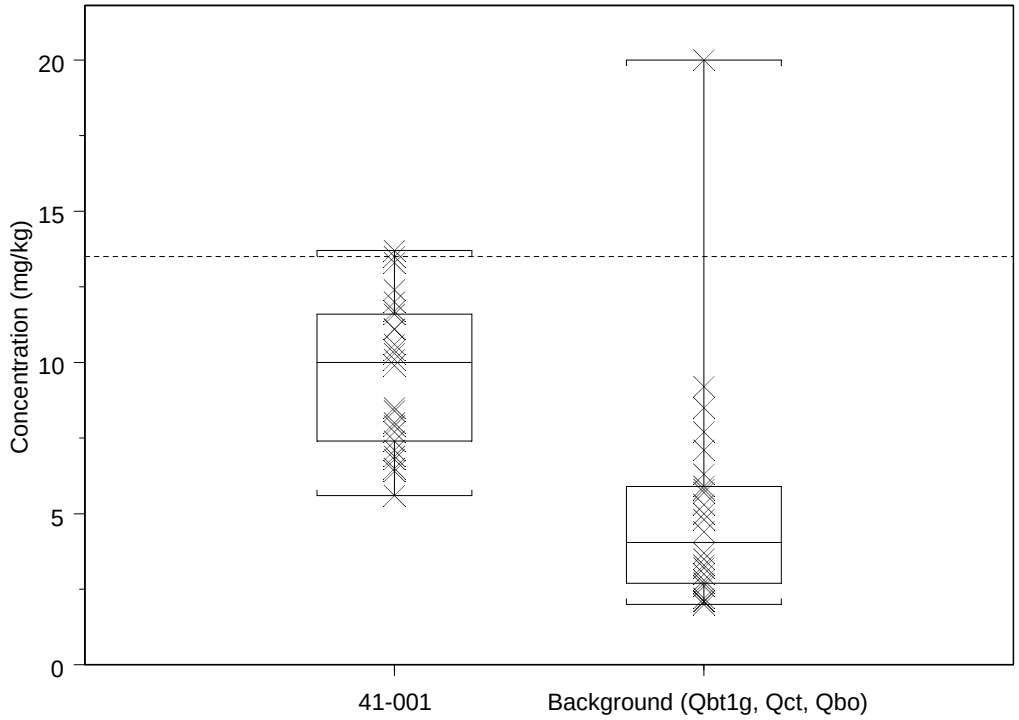


Figure F-6.1-8 Site concentrations of lead in tuff at SWMU 41-001 compared to background
(× = detect, ○ = nondetect)

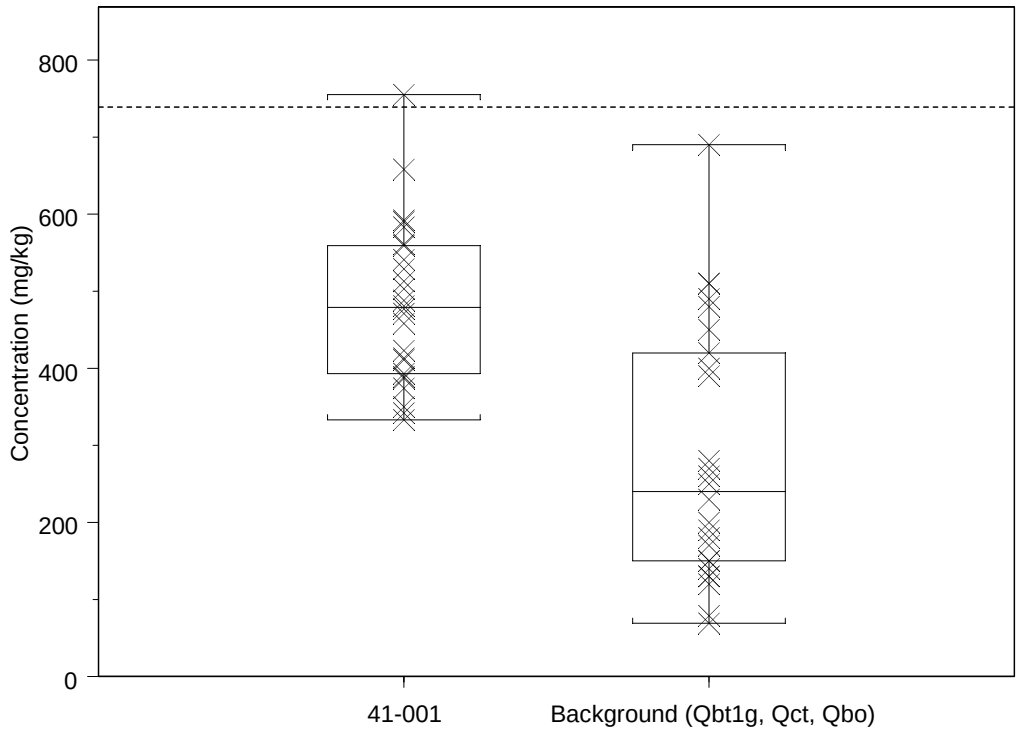


Figure F-6.1-9 Site concentrations of magnesium in tuff at SWMU 41-001 compared to background
(× = detect, ○ = nondetect)

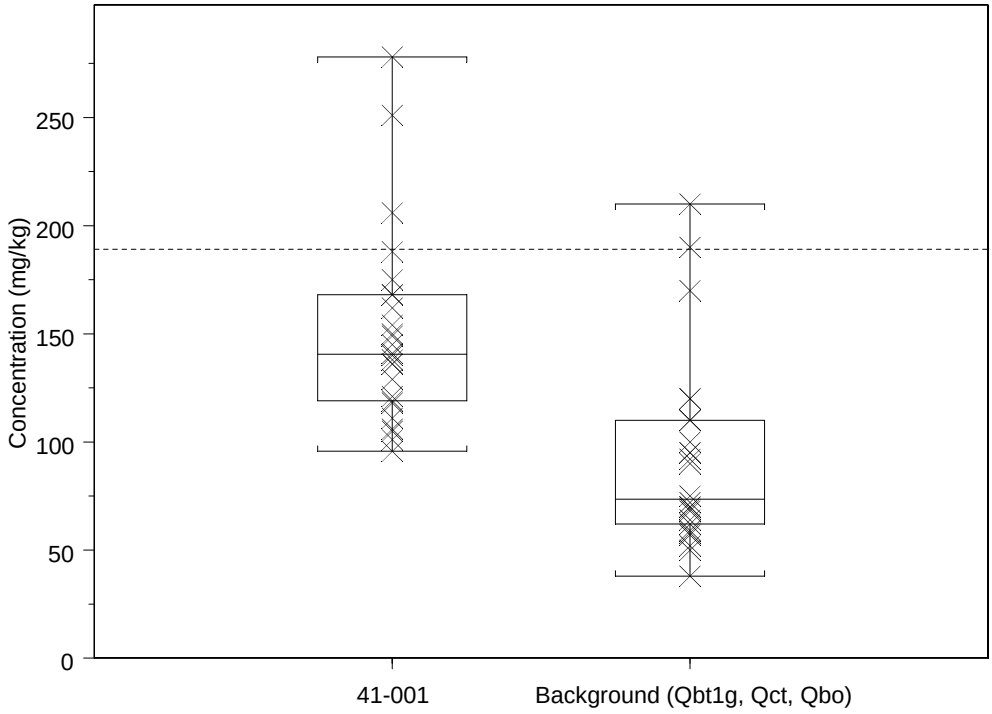


Figure F-6.1-10 Site concentrations of manganese in tuff at SWMU 41-001 compared to background

(× = detect, ○ = nondetect)

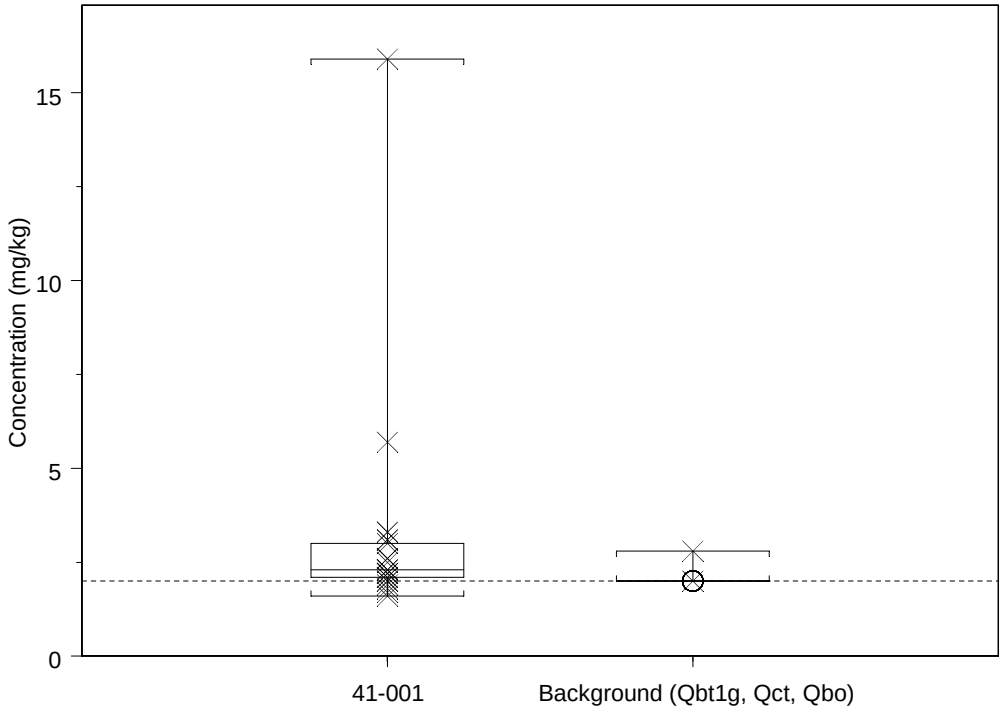


Figure F-6.1-11 Site concentrations of nickel in tuff at SWMU 41-001 compared to background

(× = detect, ○ = nondetect)

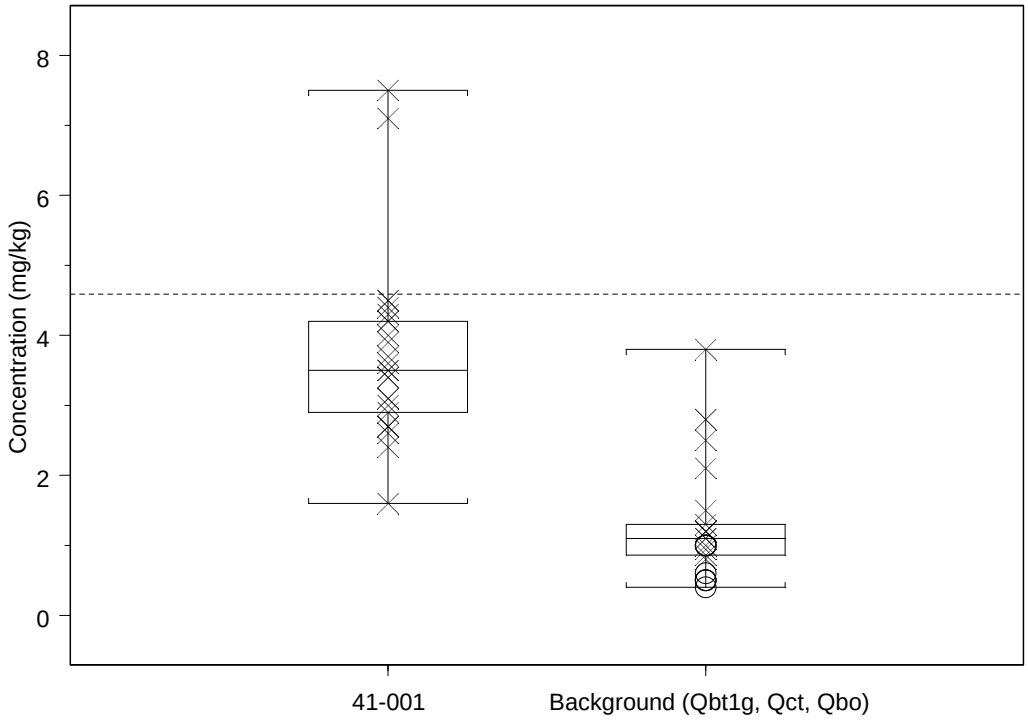


Figure F-6.1-12 Site concentrations of vanadium in tuff at SWMU 41-001 compared to background
(× = detect, ○ = nondetect)

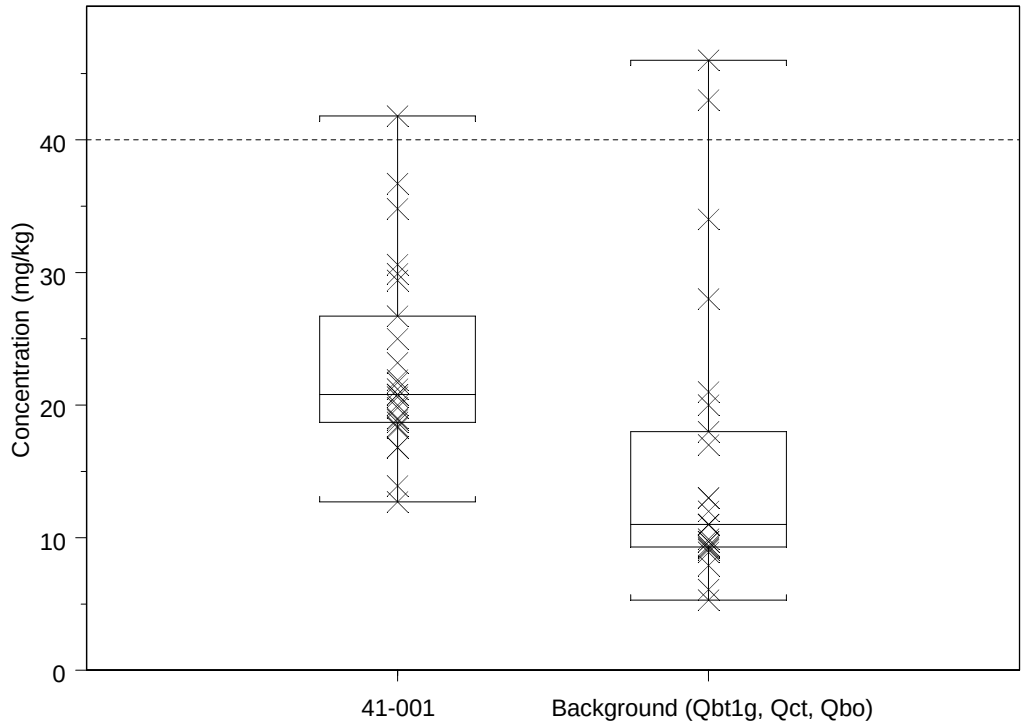


Figure F-6.1-13 Site concentrations of zinc in tuff at SWMU 41-001 compared to background
(× = detect, ○ = nondetect)

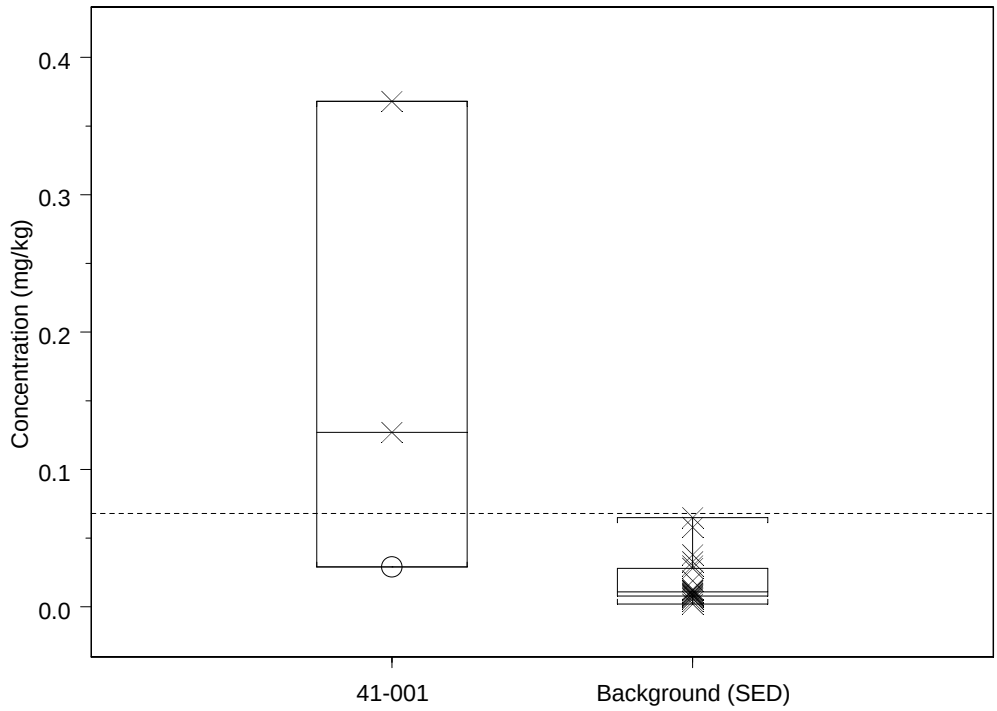


Figure F-6.1-14 Site concentrations of plutonium-239/240 in sediment at SWMU 41-001 compared to background

(× = detect, ○ = nondetect)

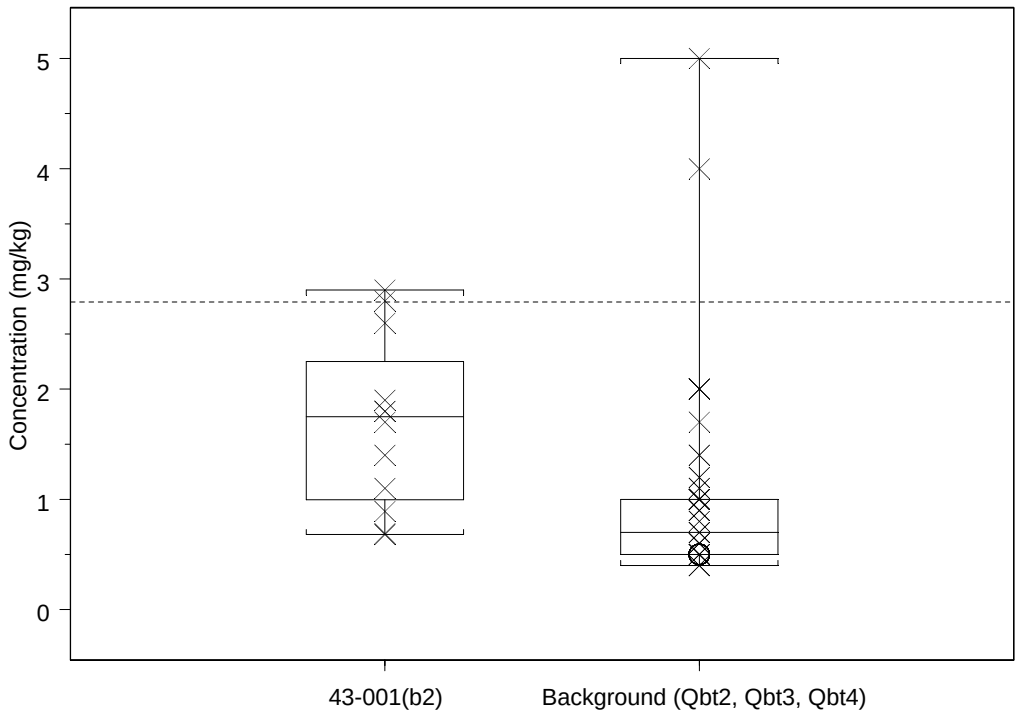


Figure F-7.1-1 Site concentrations of arsenic in tuff at AOC 43-001(b2) compared to background

(× = detect, ○ = nondetect)

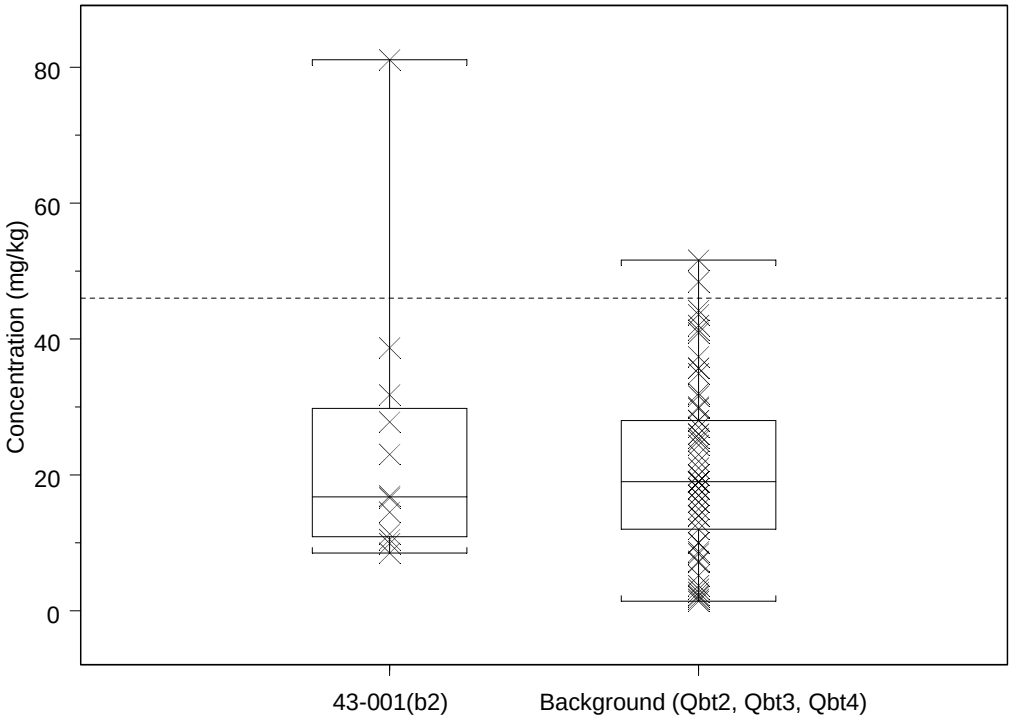


Figure F-7.1-2 Site concentrations of barium in tuff at AOC 43-001(b2) compared to background
(× = detect, ○ = nondetect)

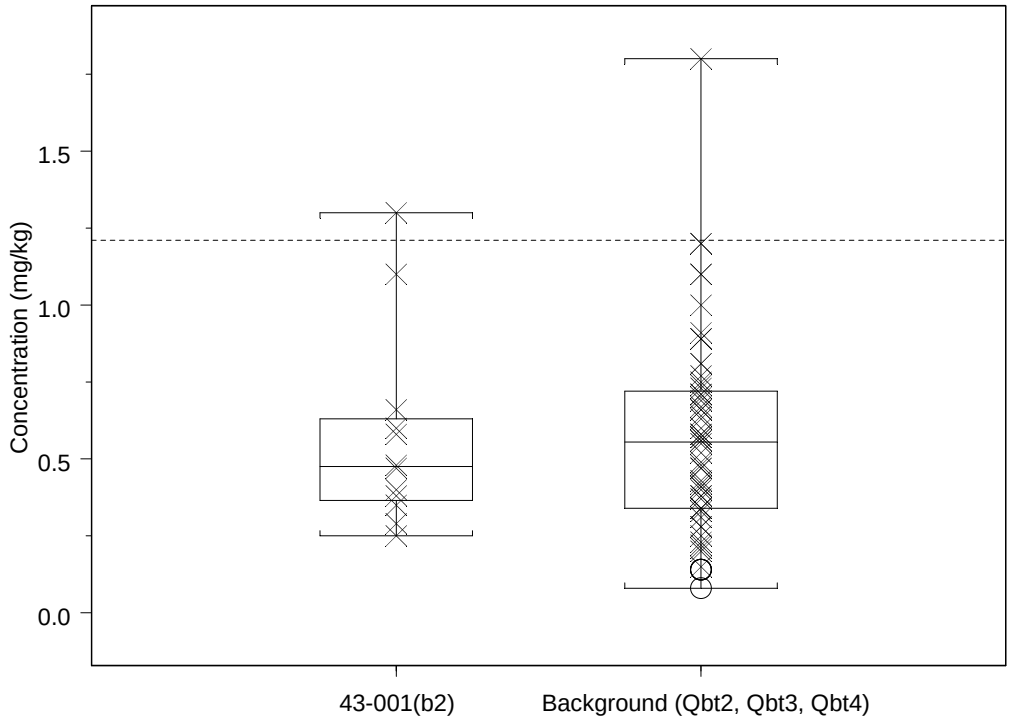


Figure F-7.1-3 Site concentrations of beryllium in tuff at AOC 43-001(b2) compared to background
(× = detect, ○ = nondetect)

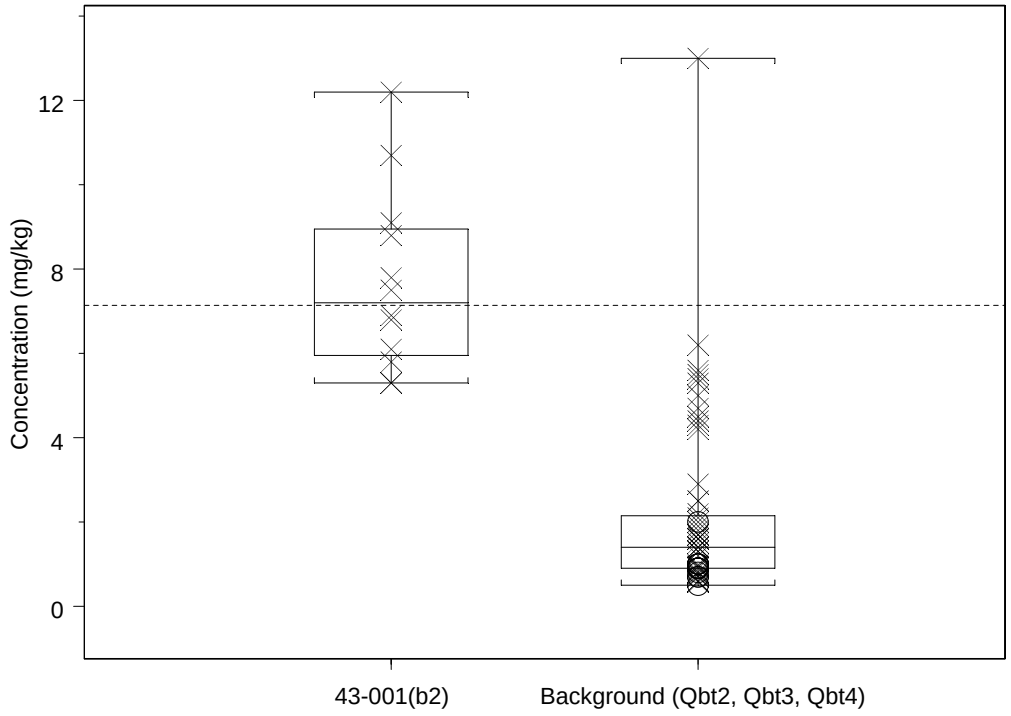


Figure F-7.1-4 Site concentrations of chromium in tuff at AOC 43-001(b2) compared to background

(× = detect, ○ = nondetect)

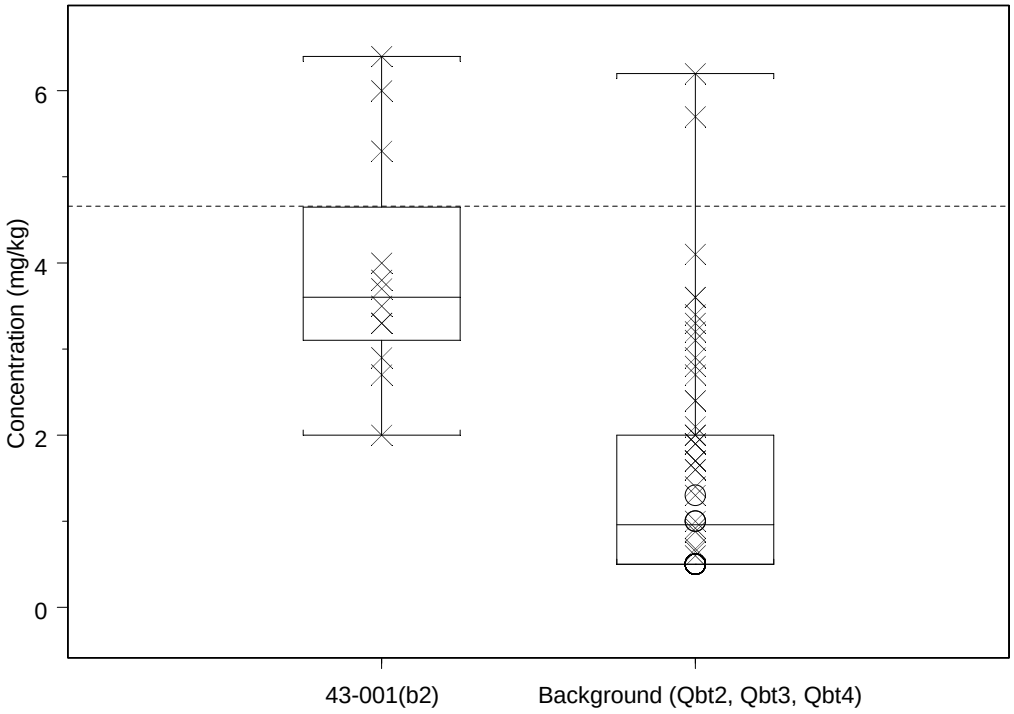


Figure F-7.1-5 Site concentrations of copper in tuff at AOC 43-001(b2) compared to background

(× = detect, ○ = nondetect)

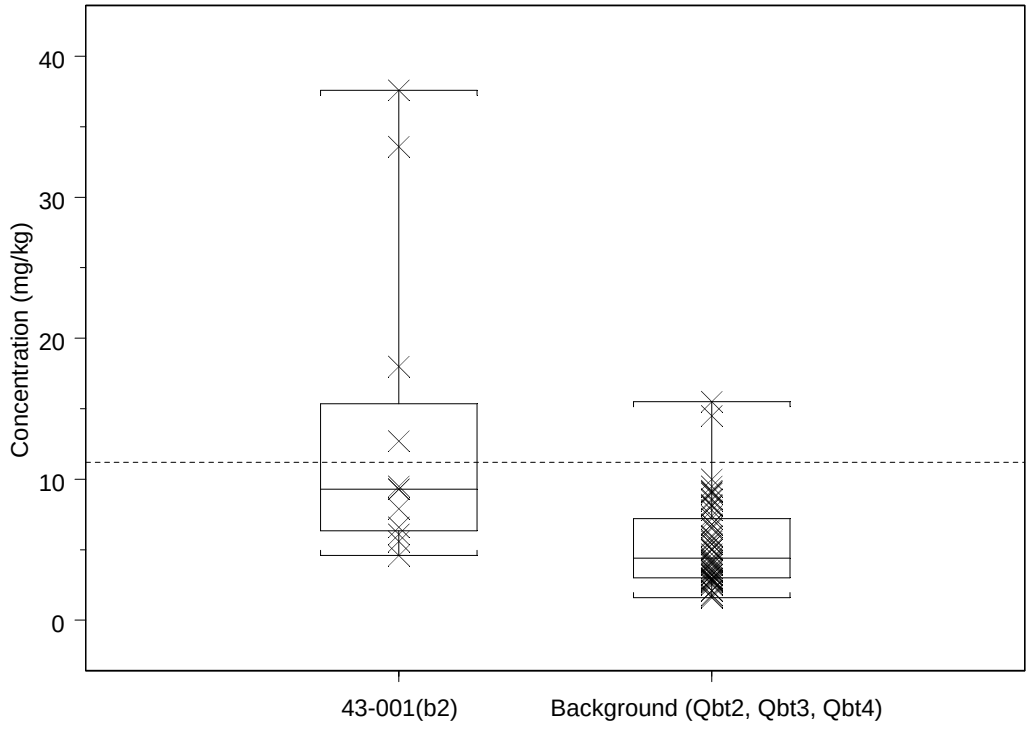


Figure F-7.1-6 Site concentrations of lead in tuff at AOC 43-001(b2) compared to background
(× = detect, ○ = nondetect)

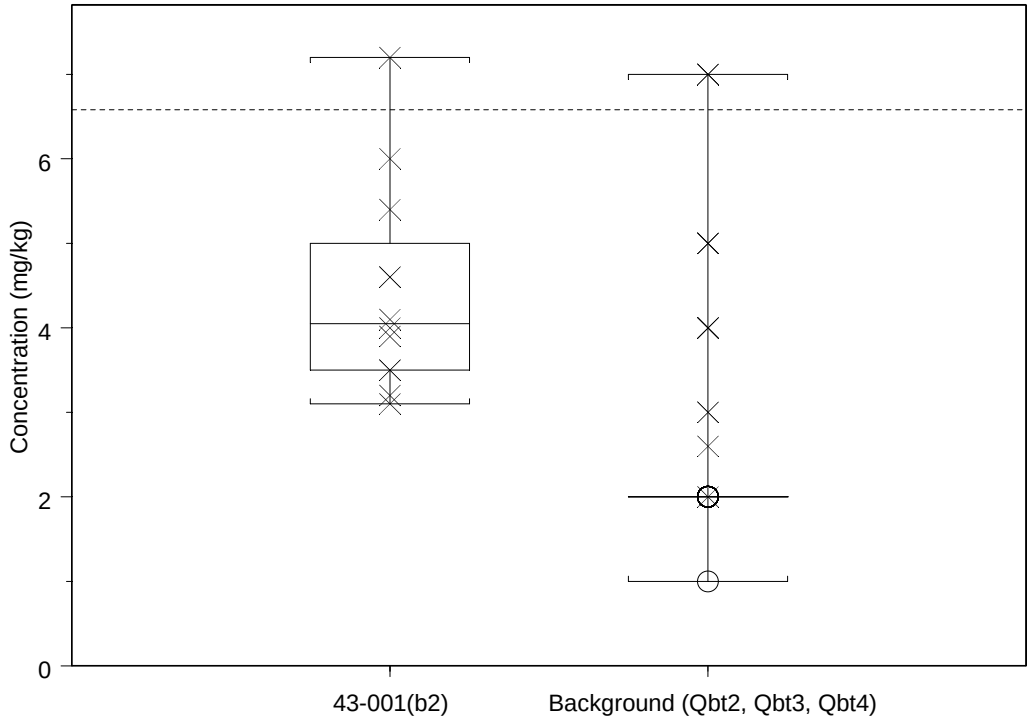


Figure F-7.1-7 Site concentrations of nickel in tuff at AOC 43-001(b2) compared to background
(× = detect, ○ = nondetect)

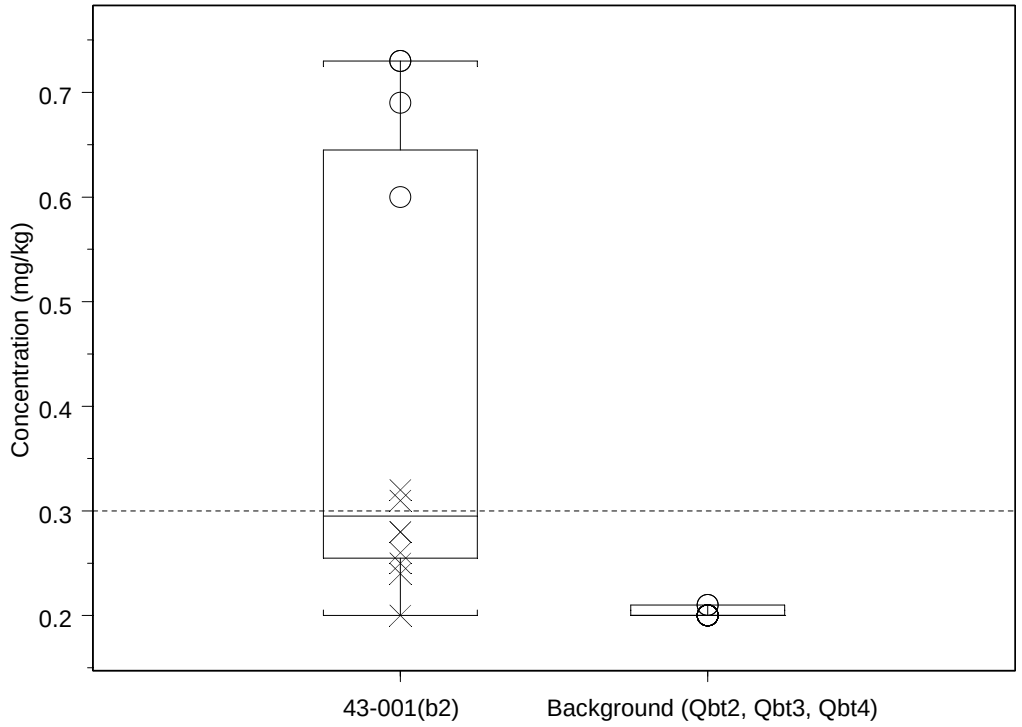


Figure F-7.1-8 Site concentrations of selenium in tuff at AOC 43-001(b2) compared to background

(× = detect, ○ = nondetect)

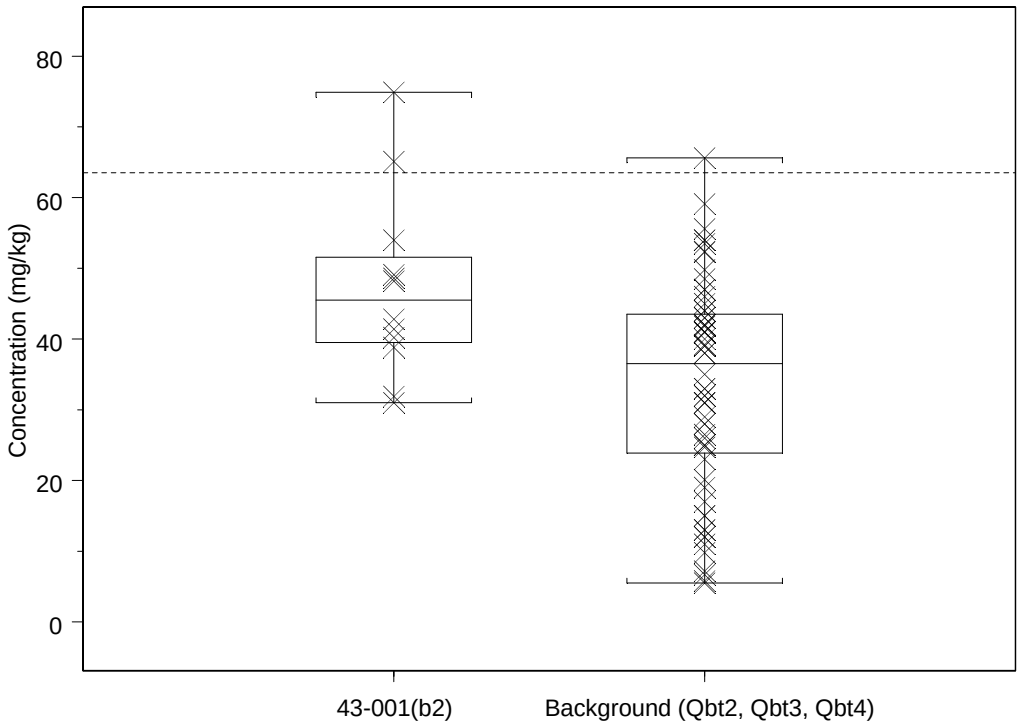


Figure F-7.1-9 Site concentrations of zinc in tuff at AOC 43-001(b2) compared to background

(× = detect, ○ = nondetect)

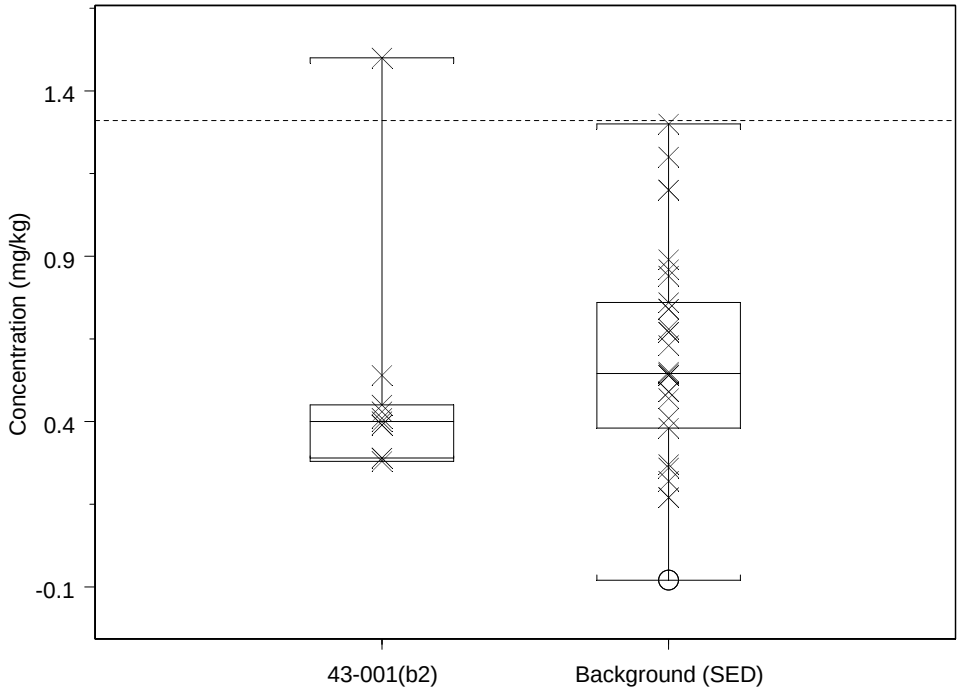


Figure F-7.1-10 Site concentrations of beryllium in sediment at AOC 43-001(b2) compared to background

(× = detect, ○ = nondetect)

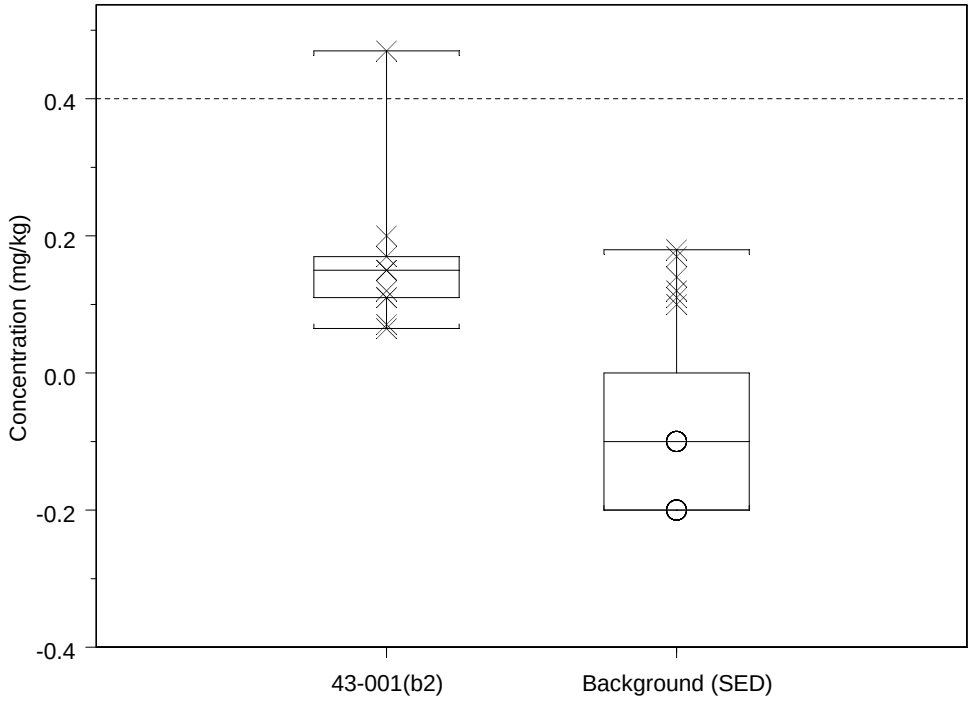


Figure F-7.1-11 Site concentrations of cadmium in sediment at AOC 43-001(b2) compared to background

(× = detect, ○ = nondetect)

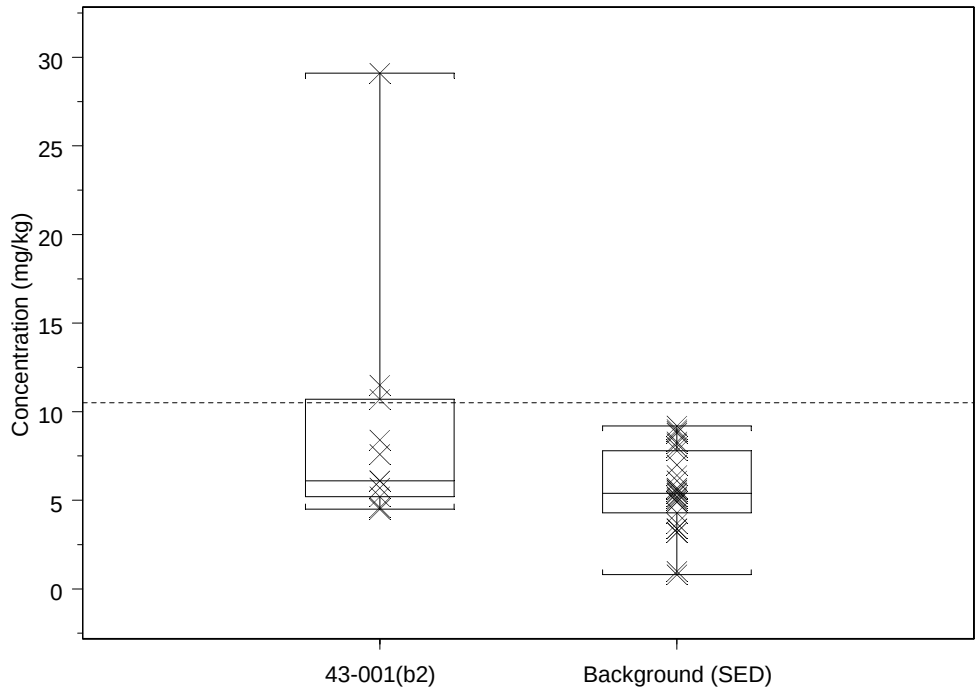


Figure F-7.1-12 Site concentrations of chromium in sediment at AOC 43-001(b2) compared to background

(× = detect, ○ = nondetect)

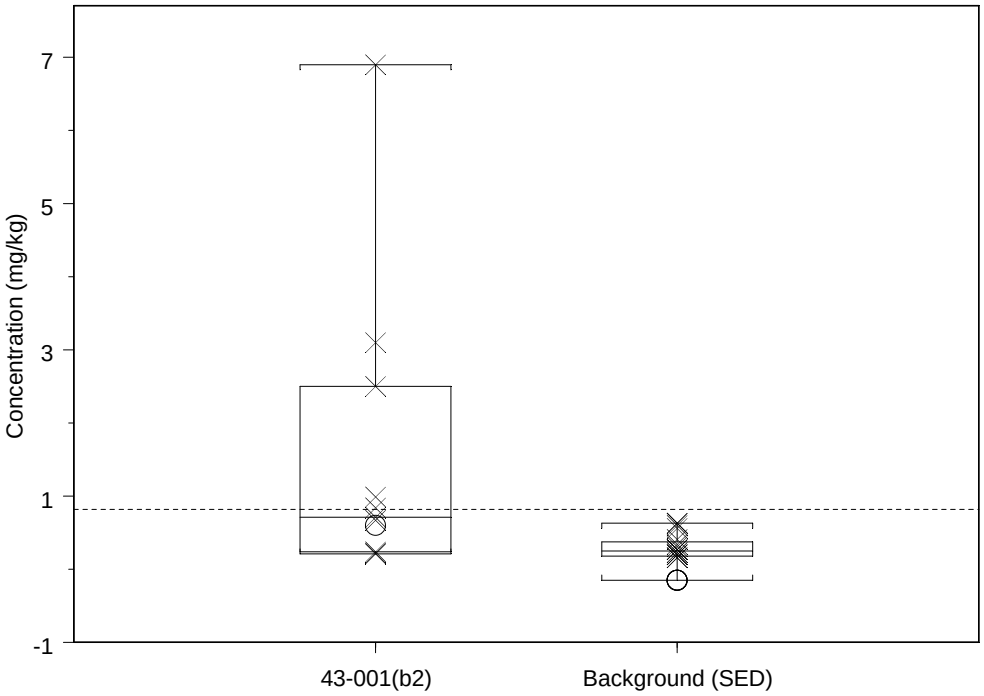


Figure F-7.1-13 Site concentrations of total cyanide in sediment at AOC 43-001(b2) compared to background

(× = detect, ○ = nondetect)

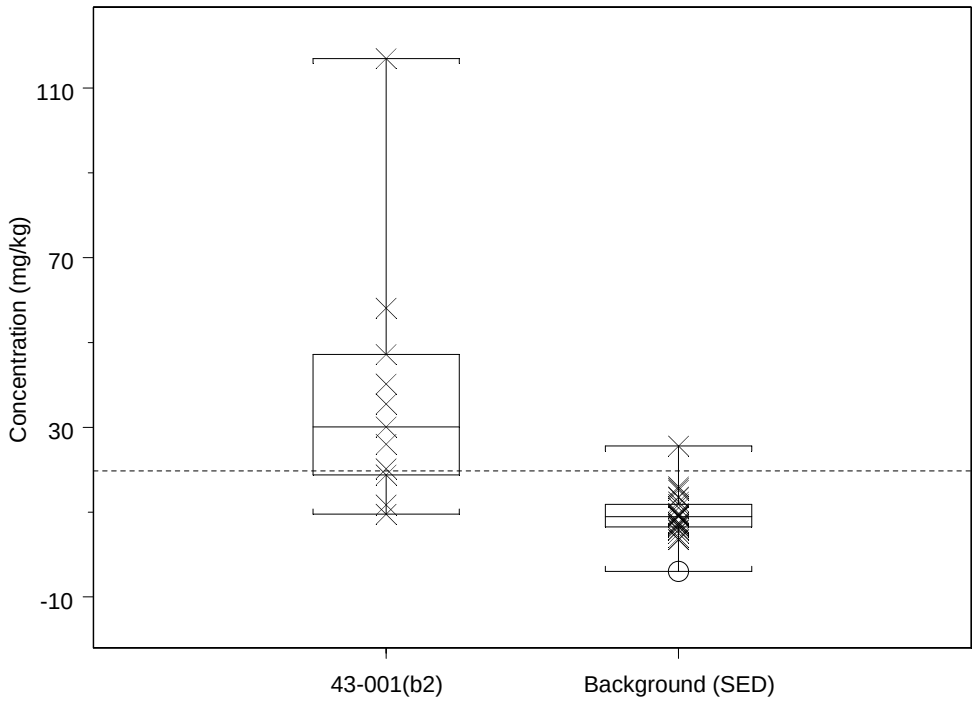


Figure F-7.1-14 Site concentrations of lead in sediment at AOC 43-001(b2) compared to background

(× = detect, ○ = nondetect)

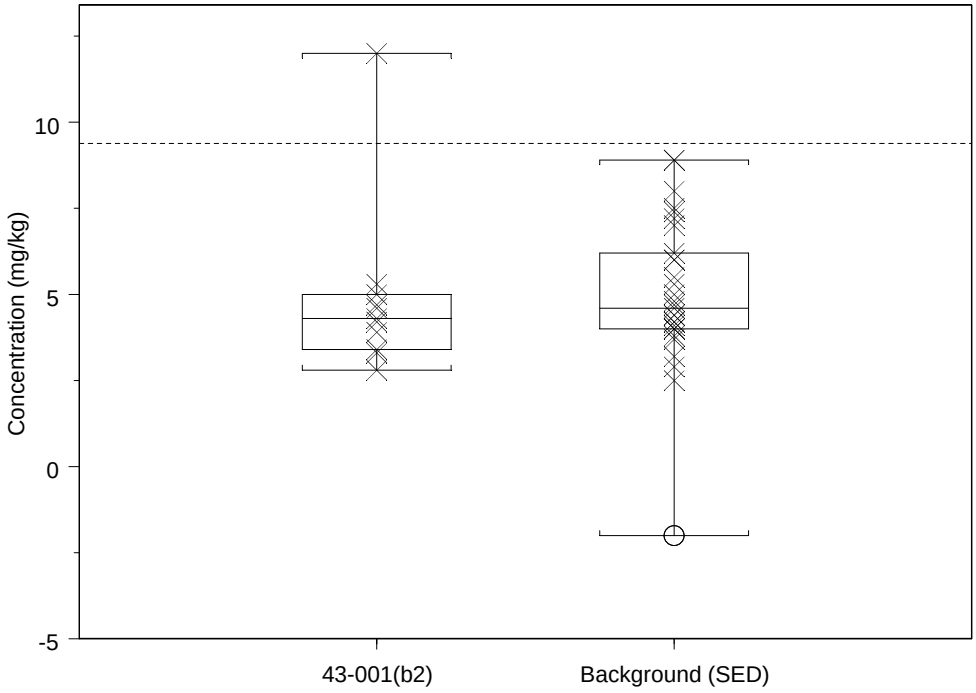


Figure F-7.1-15 Site concentrations of nickel in sediment at AOC 43-001(b2) compared to background

(× = detect, ○ = nondetect)

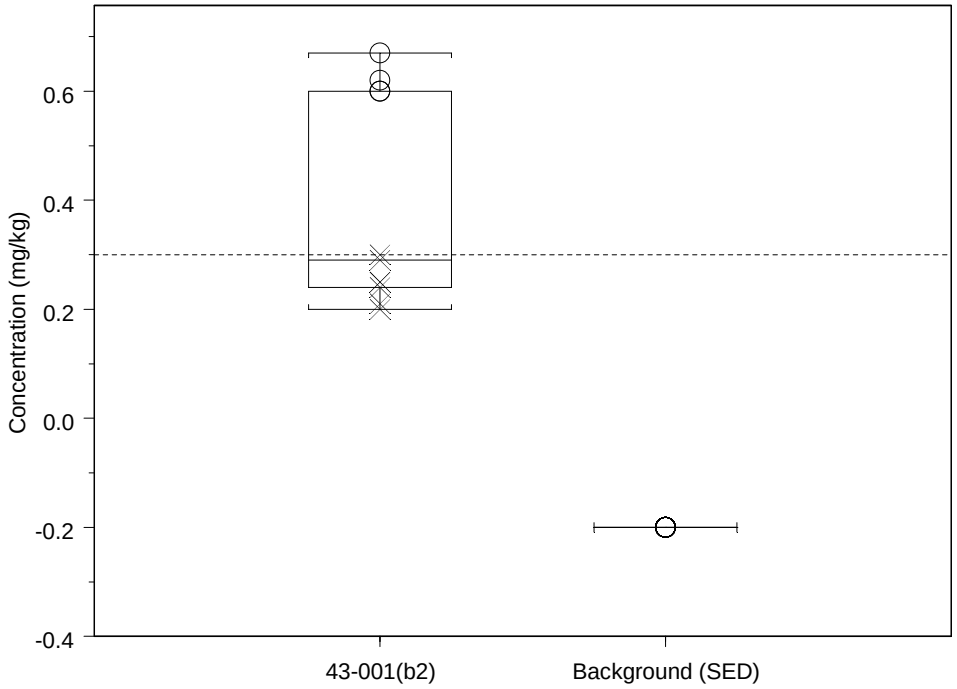


Figure F-7.1-16 Site concentrations of selenium in sediment at AOC 43-001(b2) compared to background

(× = detect, ○ = nondetect)

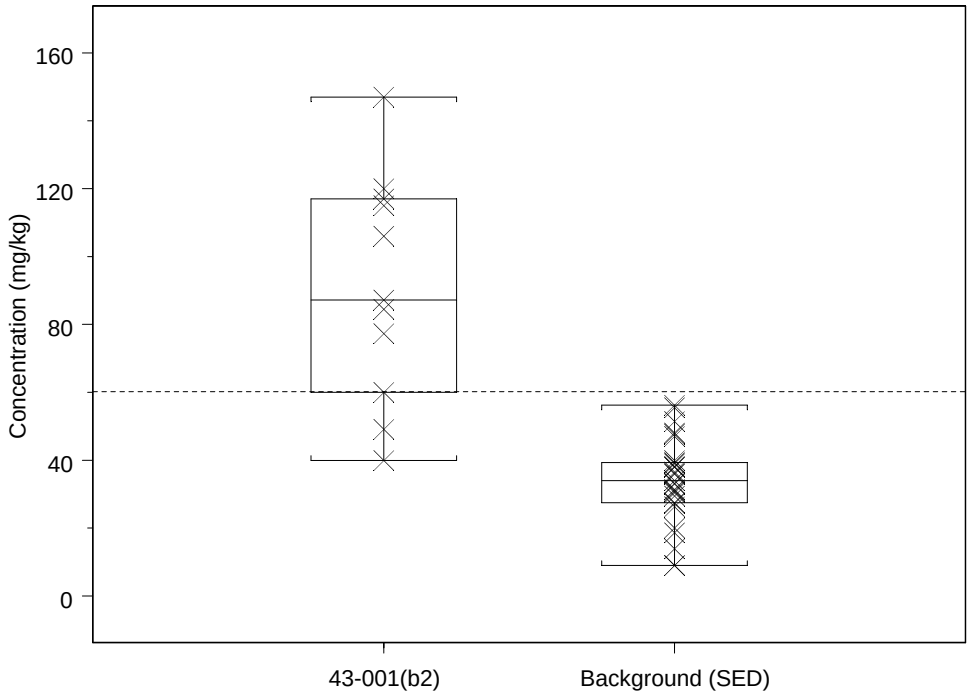


Figure F-7.1-17 Site concentrations of zinc in sediment at AOC 43-001(b2) compared to background

(× = detect, ○ = nondetect)

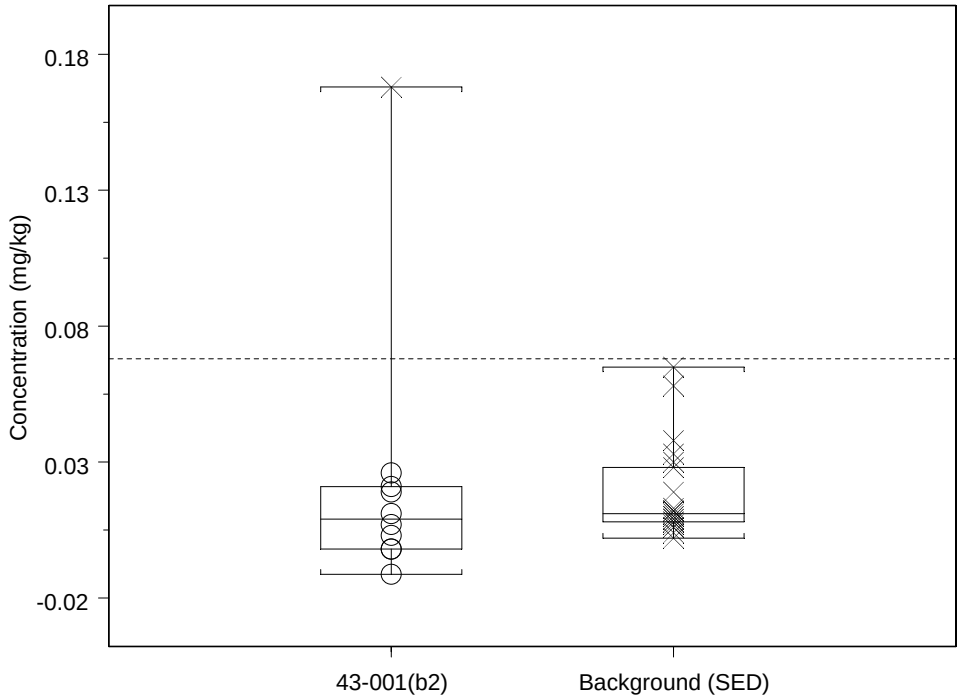


Figure F-7.1-18 Site concentrations of plutonium-239/240 in sediment at AOC 43-001(b2) compared to background

(× = detect, ○ = nondetect)

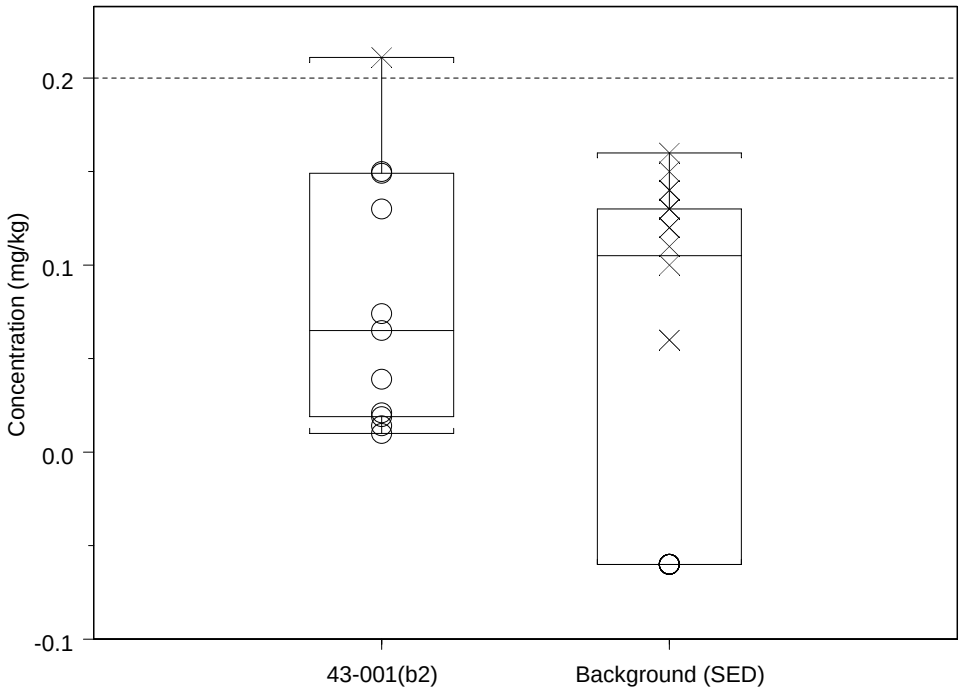


Figure F-7.1-19 Site concentrations of uranium-235/236 in sediment at AOC 43-001(b2) compared to background

(× = detect, ○ = nondetect)

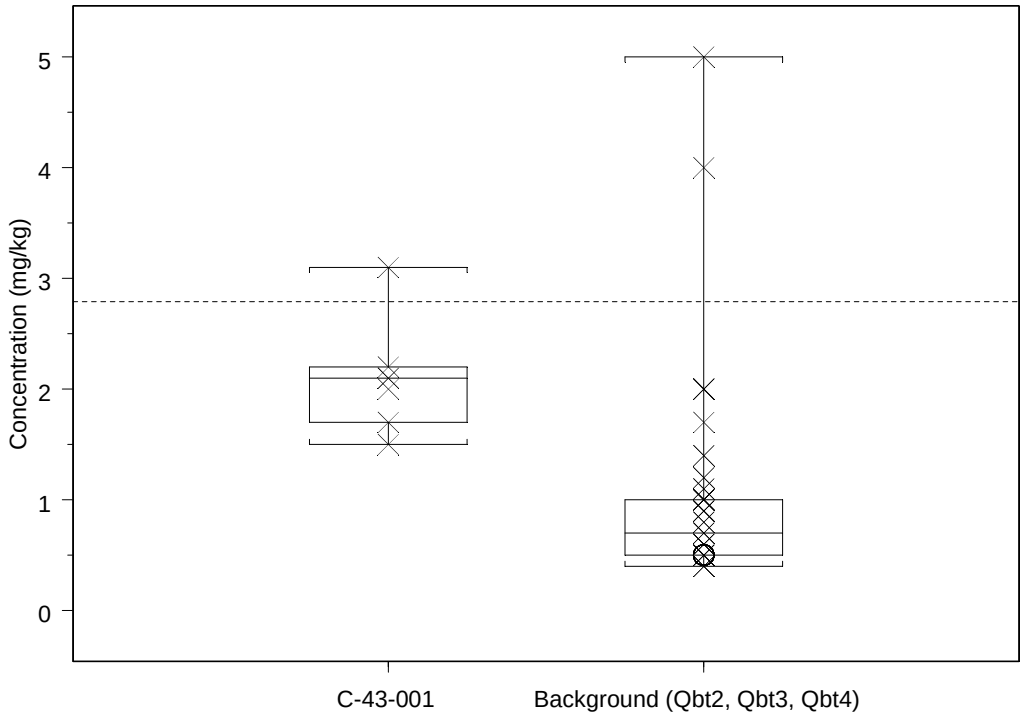


Figure F-7.2-1 Site concentrations of arsenic in tuff at AOC C-43-001 compared to background
(× = detect, ○ = nondetect)

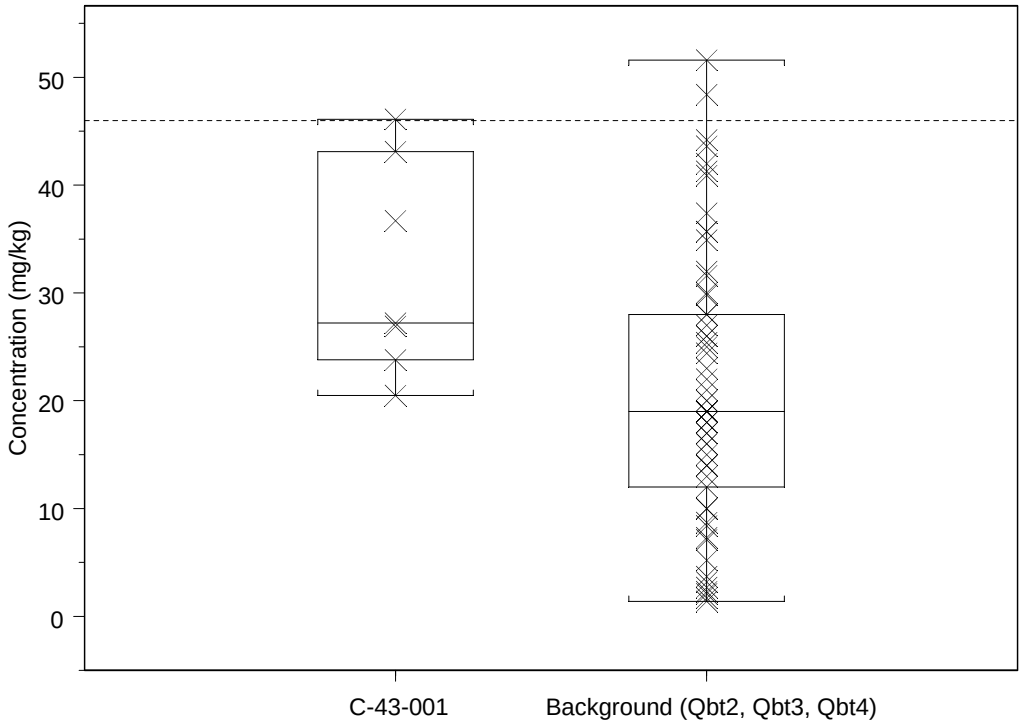


Figure F-7.2-2 Site concentrations of barium in tuff at AOC C-43-001 compared to background
(× = detect, ○ = nondetect)

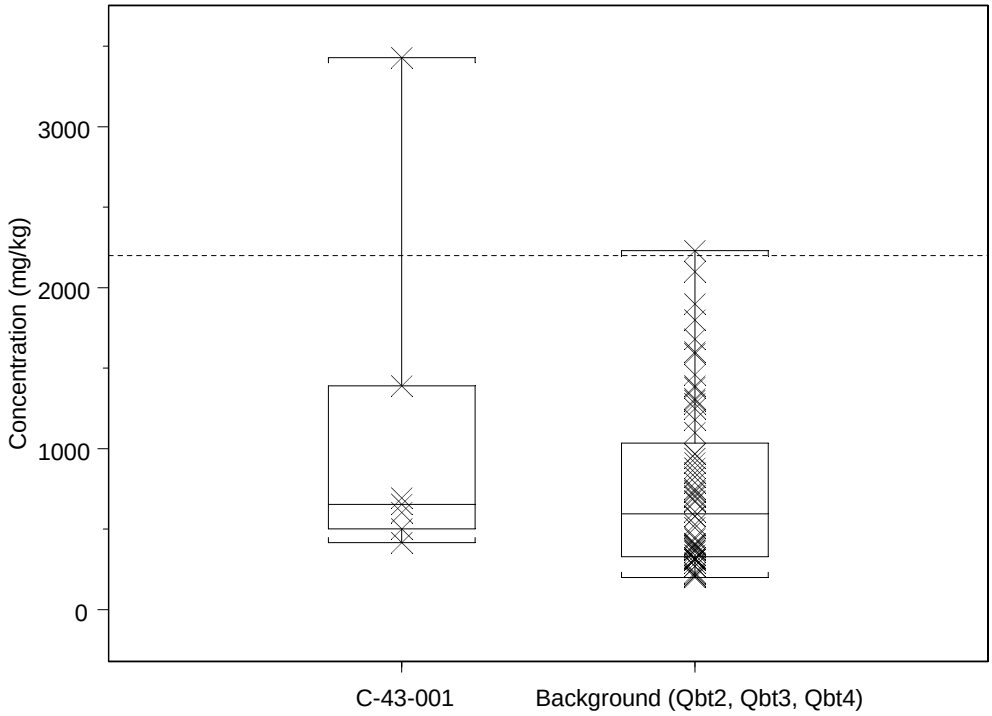


Figure F-7.2-3 Site concentrations of calcium in tuff at AOC C-43-001 compared to background
(× = detect, ○ = nondetect)

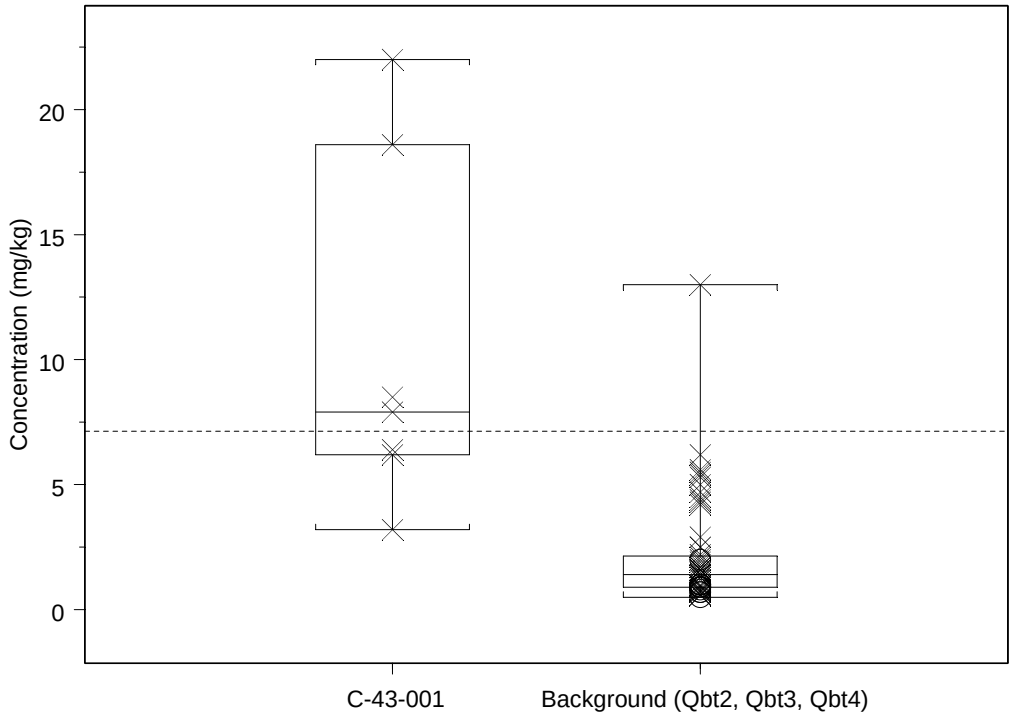


Figure F-7.2-4 Site concentrations of chromium in tuff at AOC C-43-001 compared to background
(× = detect, ○ = nondetect)

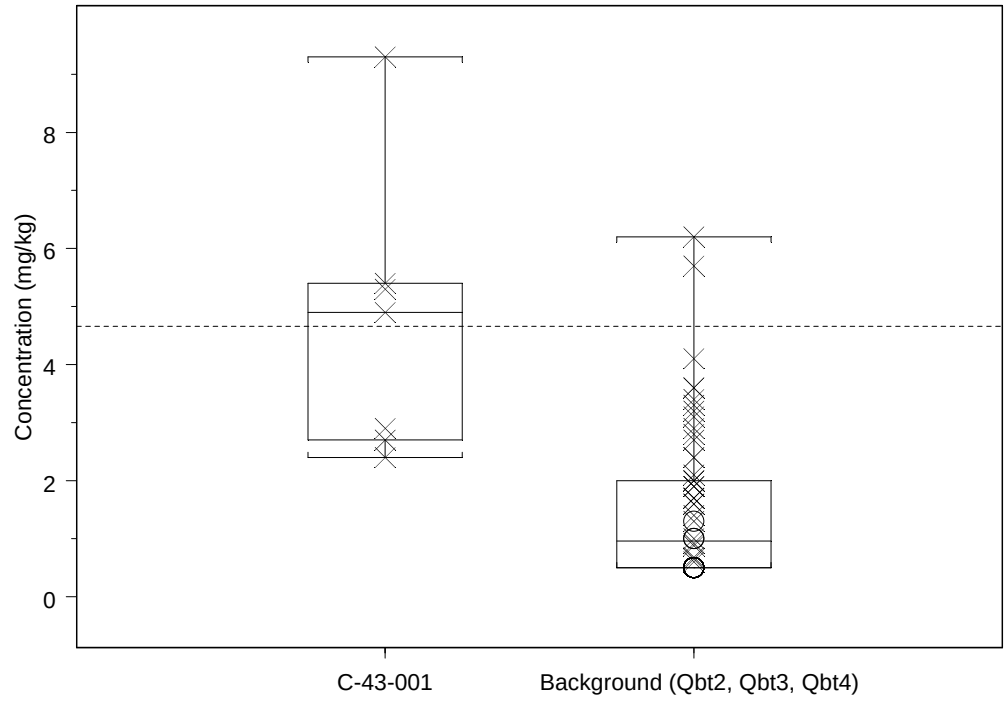


Figure F-7.2-5 Site concentrations of copper in tuff at AOC C-43-001 compared to background
(× = detect, ○ = nondetect)

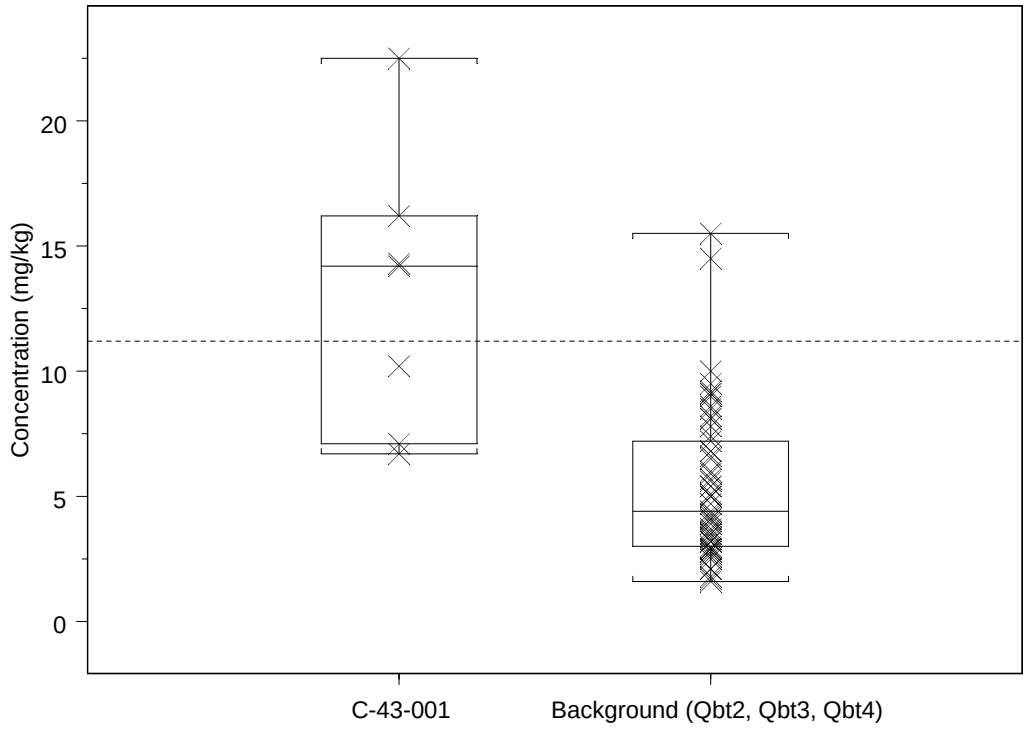


Figure F-7.2-6 Site concentrations of lead in tuff at AOC C-43-001 compared to background
(× = detect, ○ = nondetect)

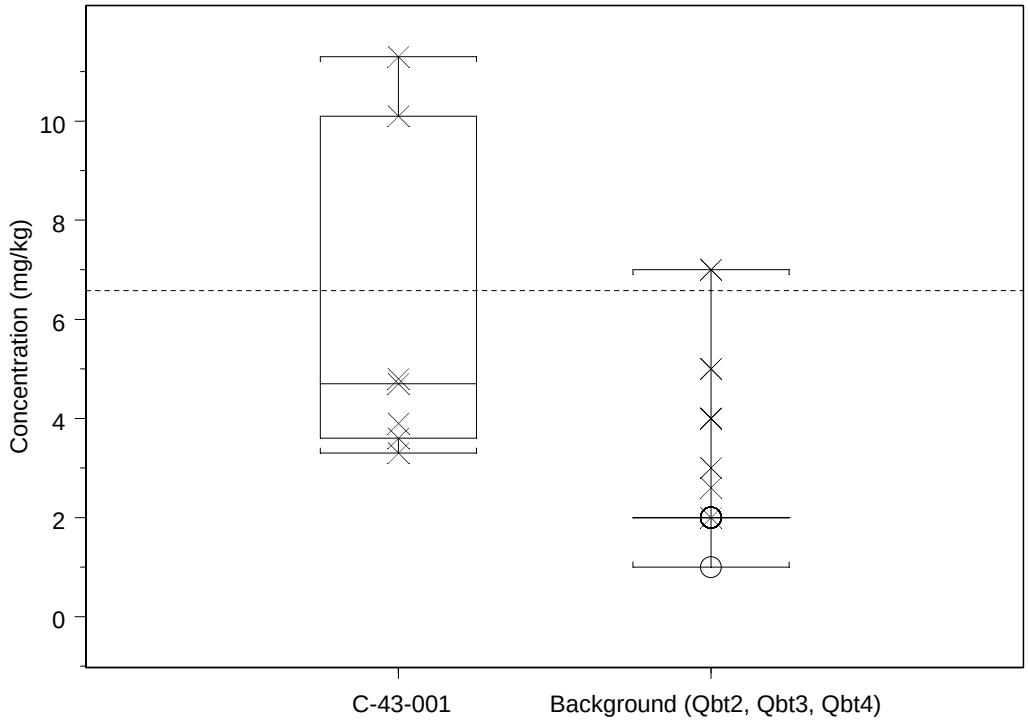


Figure F-7.2-7 Site concentrations of nickel in tuff at AOC C-43-001 compared to background
(× = detect, ○ = nondetect)

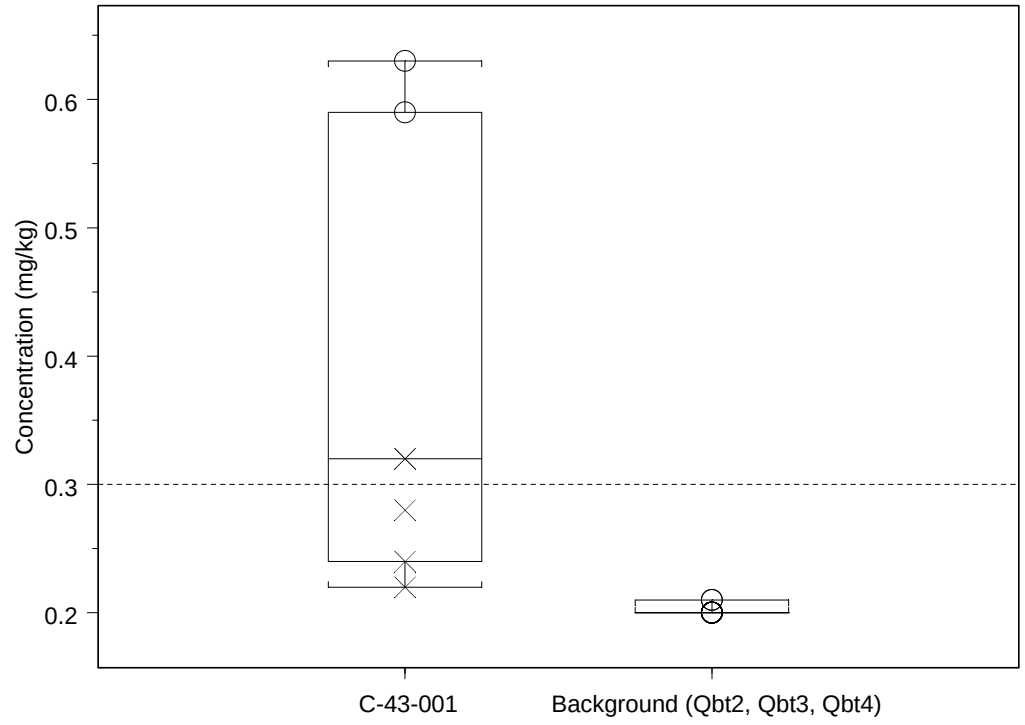


Figure F-7.2-8 Site concentrations of selenium in tuff at AOC C-43-001 compared to background
(× = detect, ○ = nondetect)

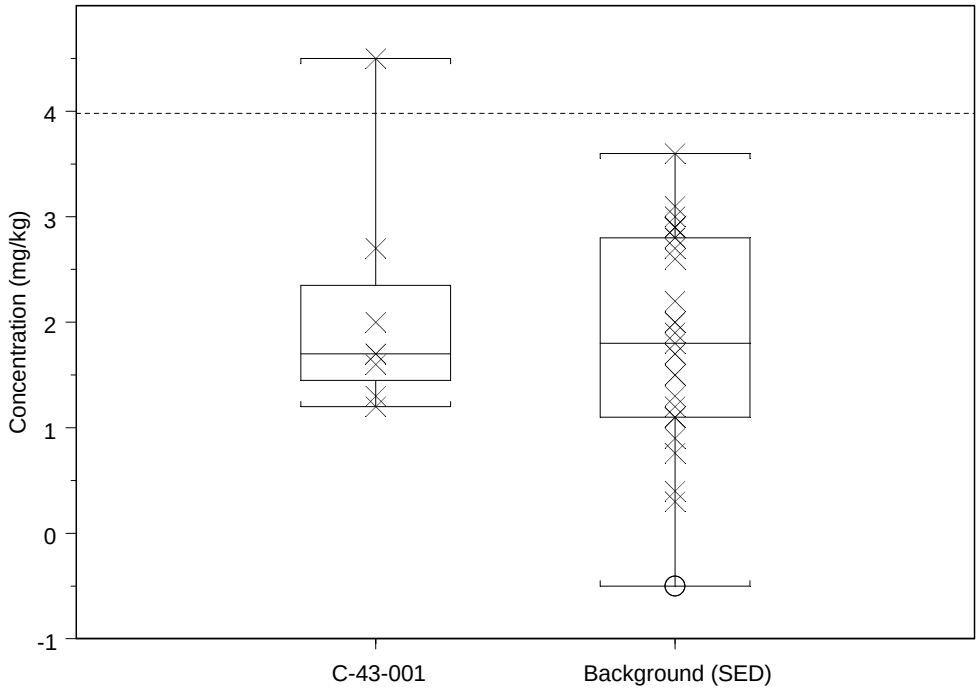


Figure F-7.2-9 Site concentrations of arsenic in sediment at AOC C-43-001 compared to background

(× = detect, ○ = nondetect)

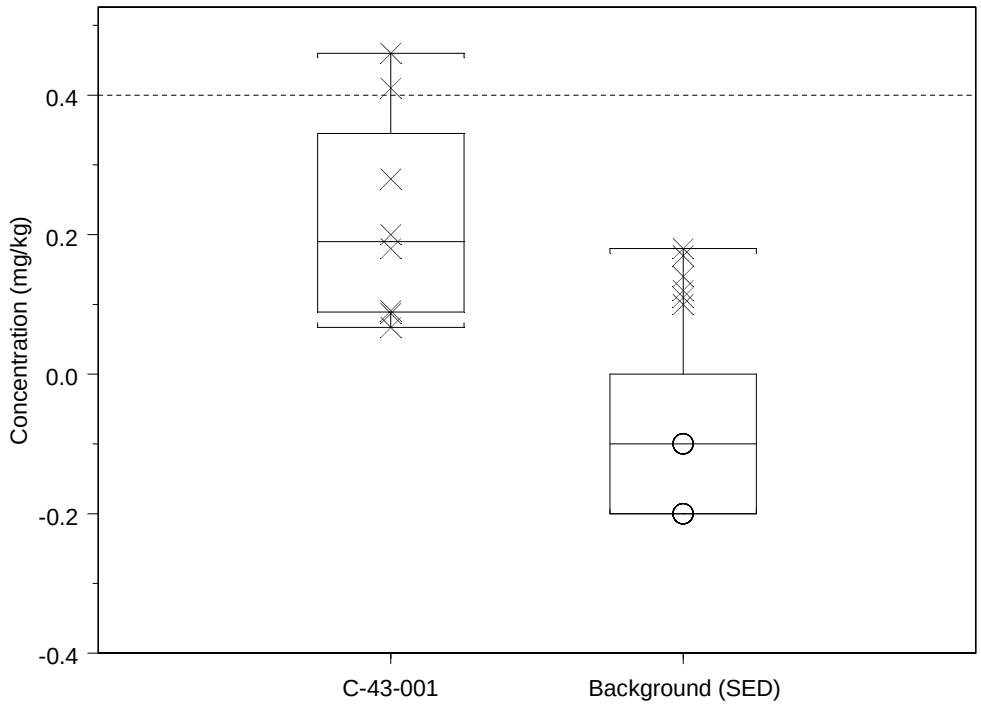


Figure F-7.2-10 Site concentrations of cadmium in sediment at AOC C-43-001 compared to background

(× = detect, ○ = nondetect)

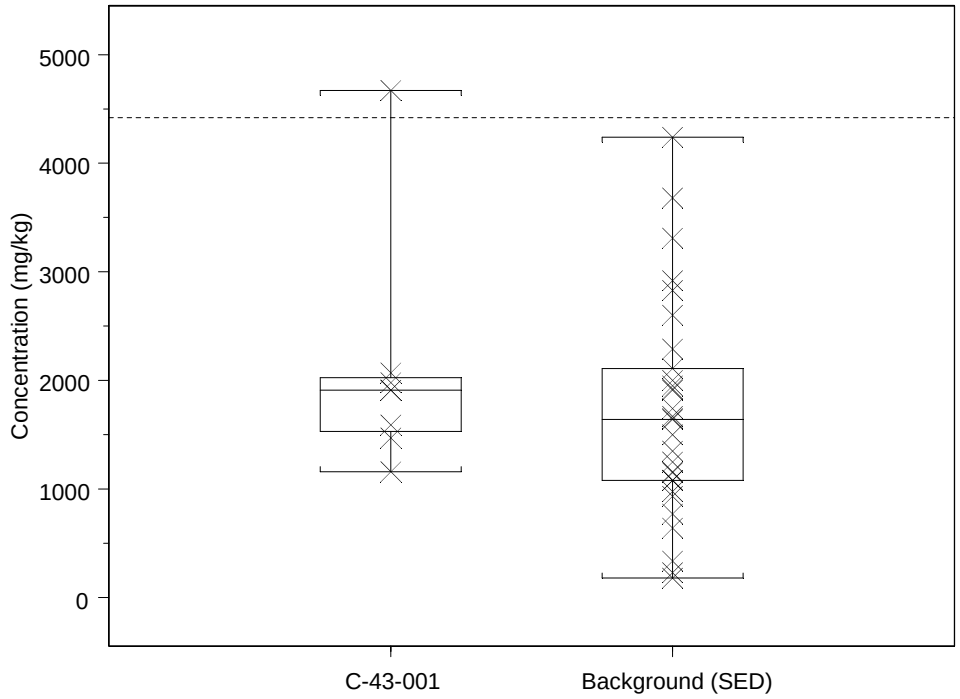


Figure F-7.2-11 Site concentrations of calcium in sediment at AOC C-43-001 compared to background

(× = detect, ○ = nondetect)

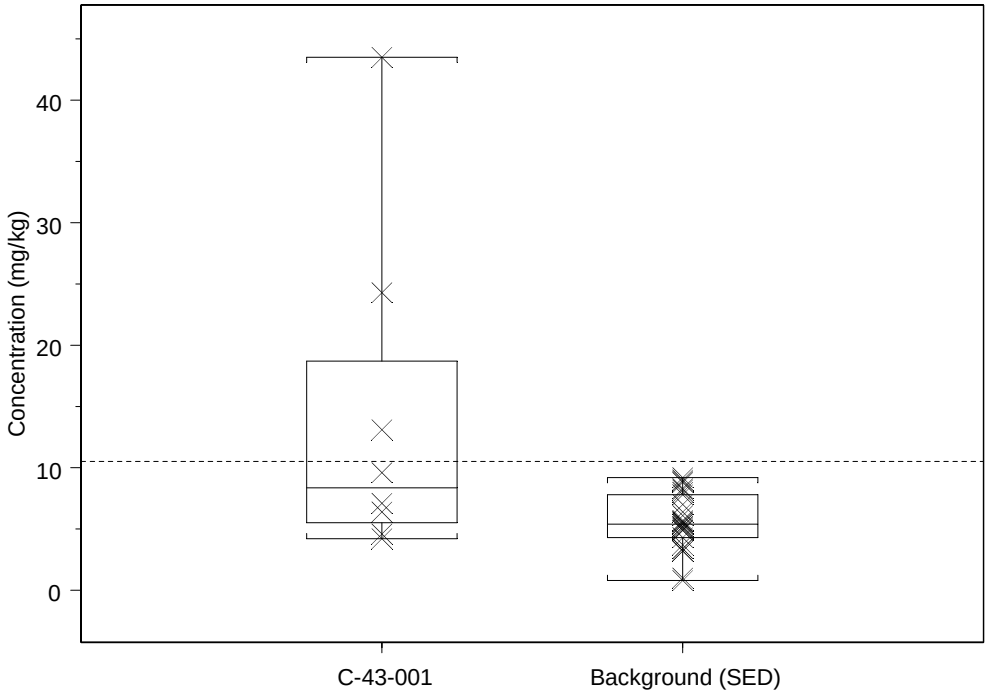


Figure F-7.2-12 Site concentrations of chromium in sediment at AOC C-43-001 compared to background

(× = detect, ○ = nondetect)

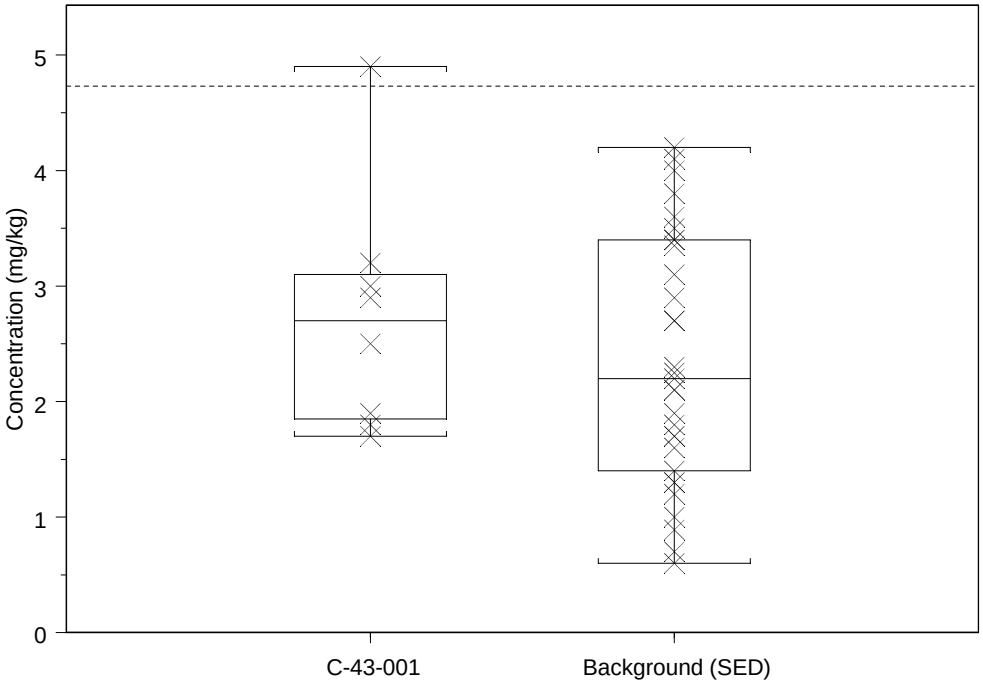


Figure F-7.2-13 Site concentrations of cobalt in sediment at AOC C-43-001 compared to background

(× = detect, ○ = nondetect)

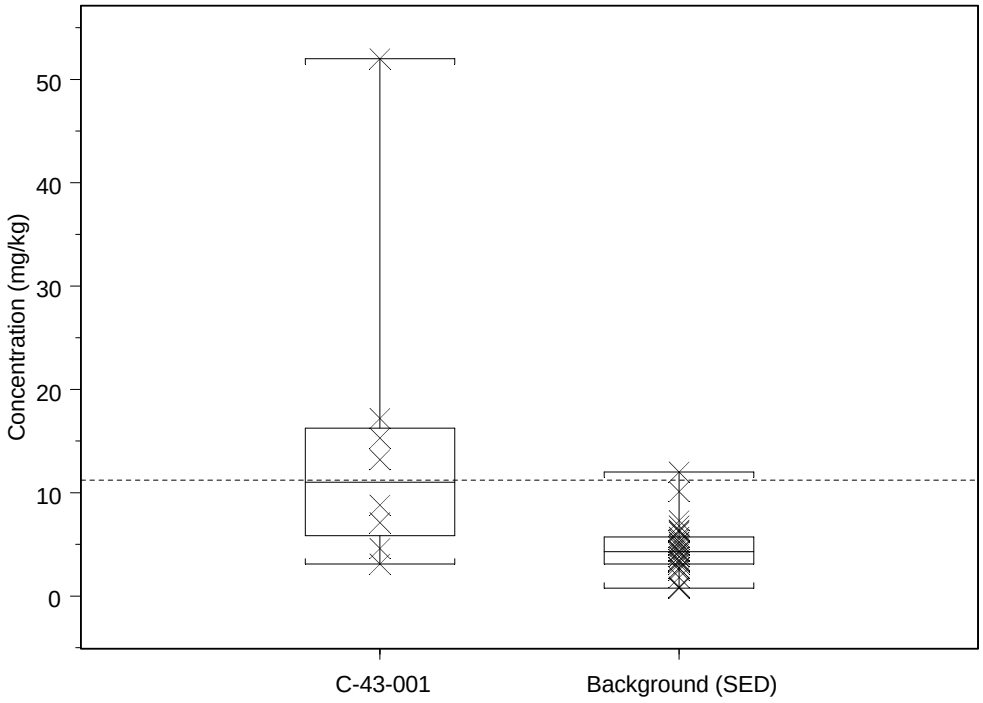


Figure F-7.2-14 Site concentrations of copper in sediment at AOC C-43-001 compared to background

(× = detect, ○ = nondetect)

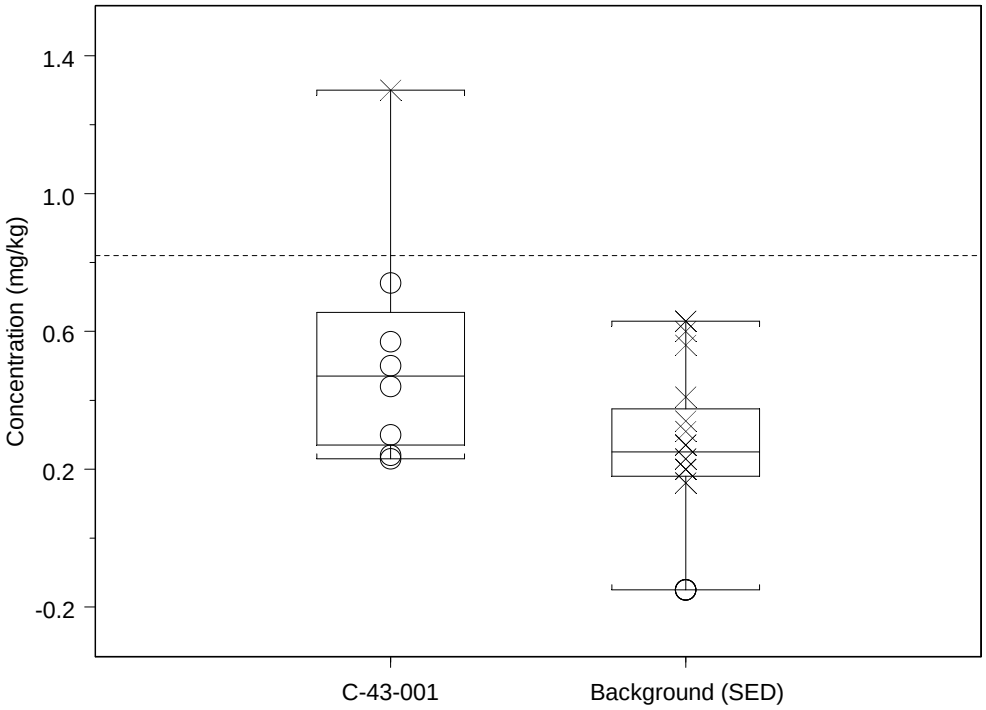


Figure F-7.2-15 Site concentrations of total cyanide in sediment at AOC C-43-001 compared to background

(× = detect, ○ = nondetect)

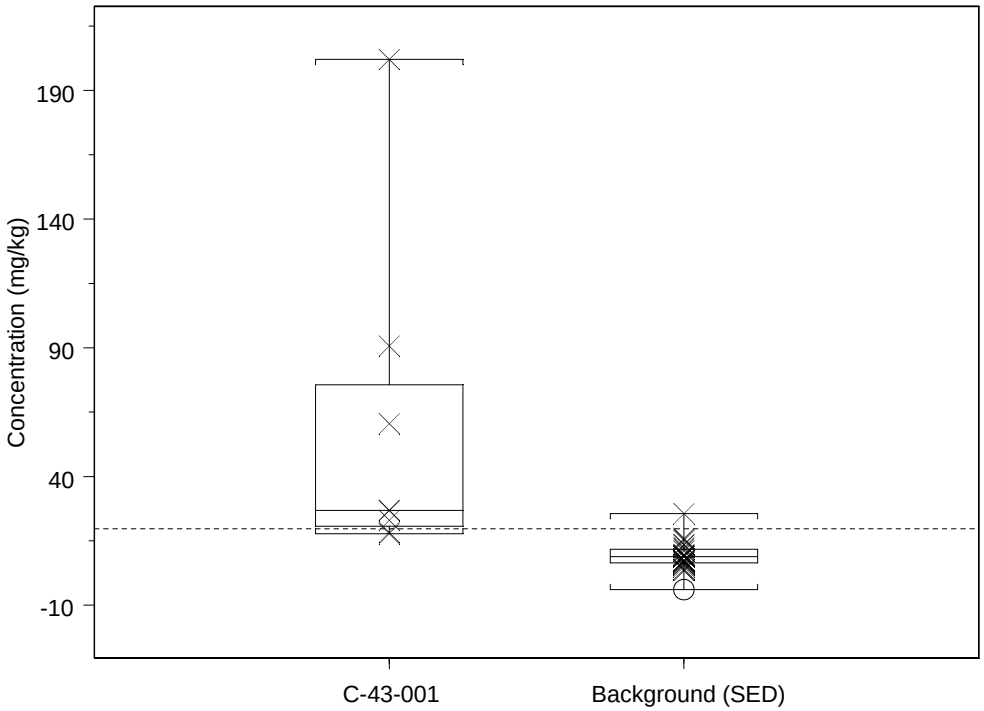


Figure F-7.2-16 Site concentrations of lead in sediment at AOC C-43-001 compared to background

(× = detect, ○ = nondetect)

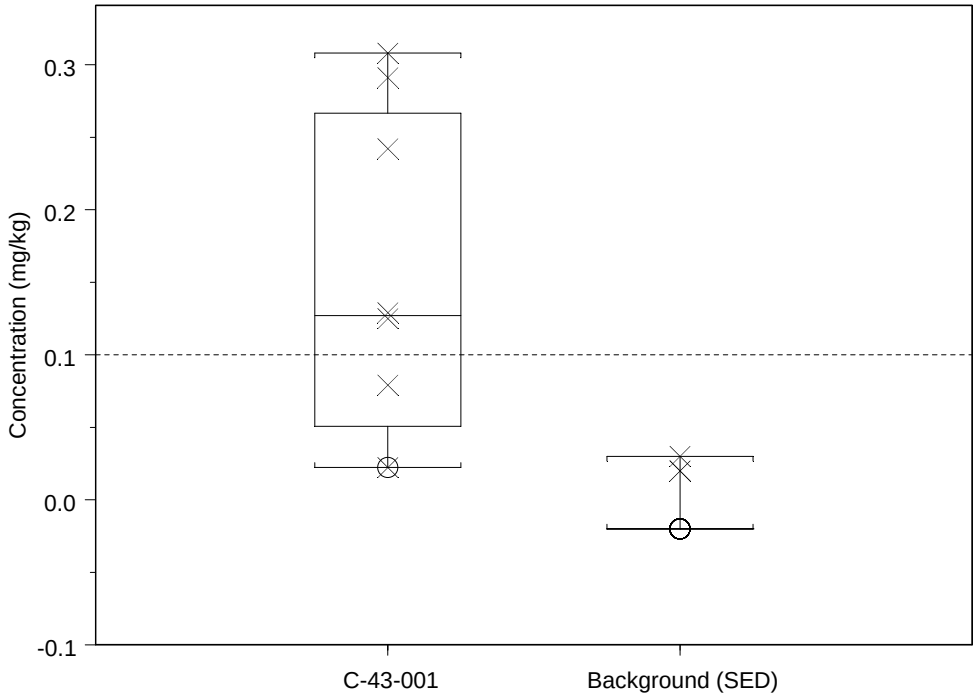


Figure F-7.2-17 Site concentrations of mercury in sediment at AOC C-43-001 compared to background

(× = detect, ○ = nondetect)

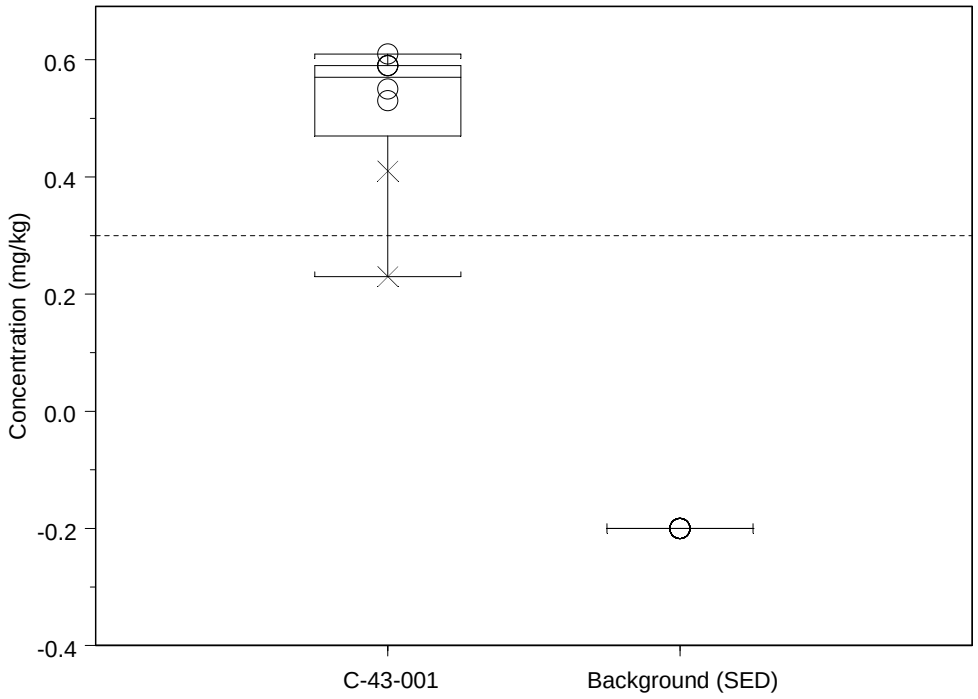


Figure F-7.2-18 Site concentrations of selenium in sediment at AOC C-43-001 compared to background

(× = detect, ○ = nondetect)

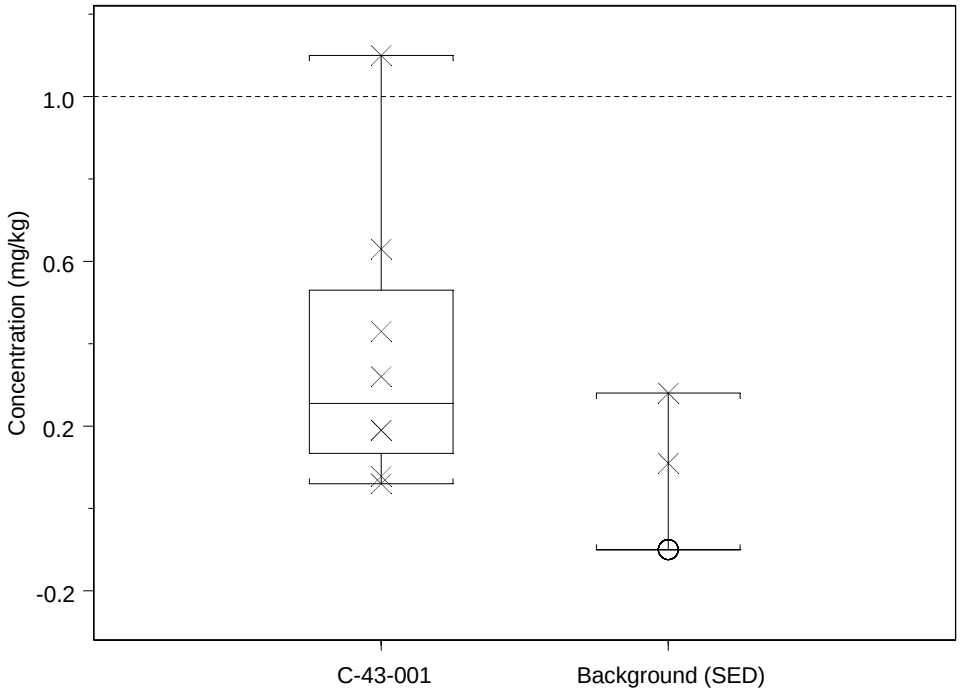


Figure F-7.2-19 Site concentrations of silver in sediment at AOC C-43-001 compared to background

(× = detect, ○ = nondetect)

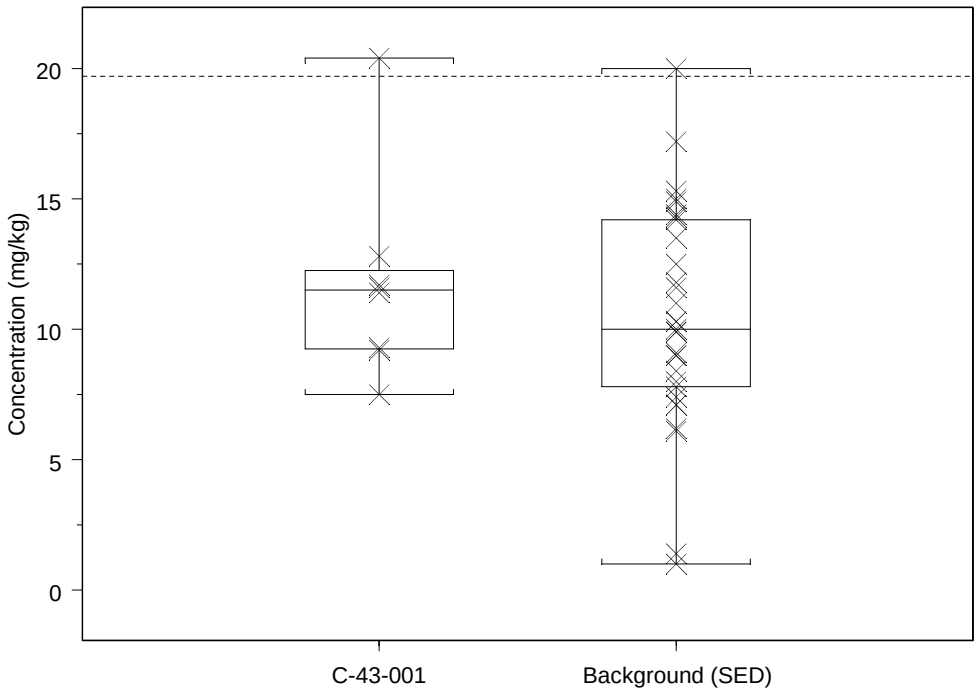


Figure F-7.2-20 Site concentrations of vanadium in sediment at AOC C-43-001 compared to background

(× = detect, ○ = nondetect)

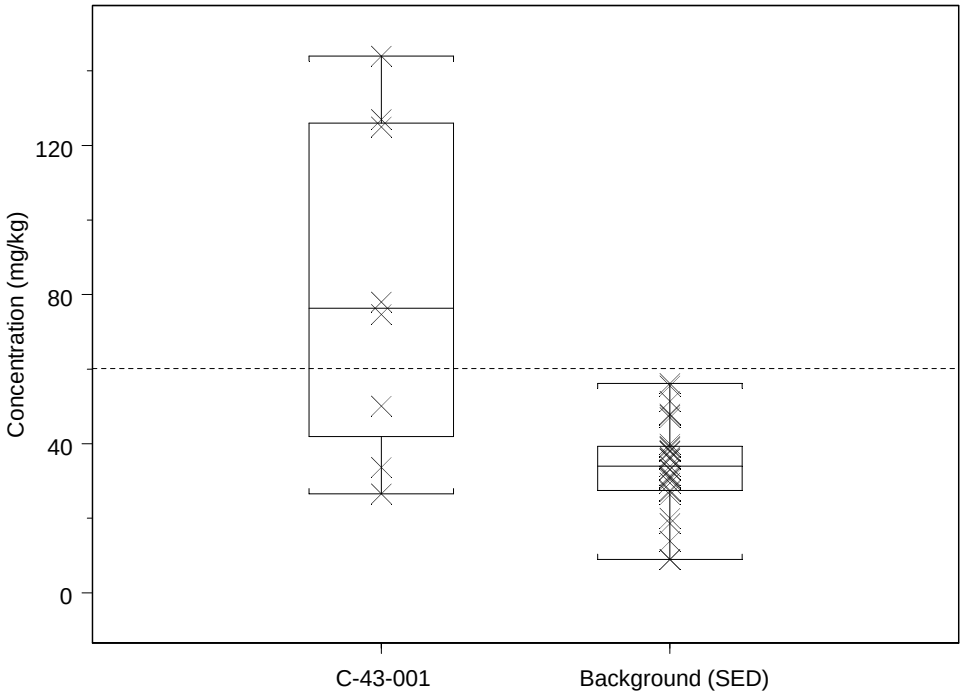


Figure F-7.2-21 Site concentrations of zinc in sediment at AOC C-43-001 compared to background

(× = detect, ○ = nondetect)

Appendix G

Risk Assessments

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Attachments

Attachment G-1 ProUCL Files (on DVD included with this document)

Attachment G-2 Johnson and Ettinger Model Spreadsheets (on DVD included with this document)

Attachment G-3 Ecological Scoping Checklists

G-1.0 INTRODUCTION

This appendix presents the results of the human health and ecological risk screening assessments conducted in support of environmental characterization of the sites within the Upper Los Alamos Canyon Aggregate Area. The solid waste management units (SWMUs) and areas of concern (AOCs) investigated are within Technical Area 00 (TA-00), TA-03, TA-41, TA-43, and TA-61 and former TA-01 and former TA-32 at Los Alamos National Laboratory (LANL or the Laboratory) (Figure 1.1-1 of the investigation report and Plates 2.1-1 and 2.2-1).

G-2.0 BACKGROUND

G-2.1 Site Descriptions and Operational History

The following information on site descriptions and operational history is for sites where nature and extent have been defined.

G-2.1.1 TA-00

TA-00 includes all Laboratory-related operations and sites outside former or current Laboratory boundaries. These sites are geographically separated and scattered across the Pajarito Plateau in the northern part of Los Alamos County and in adjacent Santa Fe County.

AOC 00-031(a), Soil Contamination beneath Former Service Station

AOC 00-031(a) was designated as potentially contaminated soil beneath a former service station east of the Hilltop House Hotel on Trinity Drive at 4th Street. The service station was operated by the Zia Company on land then-owned by the Atomic Energy Commission until the early 1960s (LANL 1990, 007511, p. 0-031; LANL 1992, 007667, p. 5-115). In the 1960s, the land was transferred from the Atomic Energy Commission into private ownership (LANL 1995, 050053). The Hilltop House Hotel was renovated in the late 1980s and three fiberglass tanks were installed northwest of the hotel to support new gas pumps at the north end of the hotel.

G-2.1.2 Former TA-01, Main Technical Area

Former TA-01 is located on the southern portion of East Mesa and encompasses a portion of the present-day Los Alamos town site, roughly demarcated by Los Alamos Canyon (on the southern boundary), Central Avenue (on the northern boundary), 15th Street (on the eastern boundary), and the western reach of Timber Ridge Road (on the western boundary). The approximately 50-acre mesa top area was the location of the initial Los Alamos Scientific Laboratory (LASL) from 1943 to 1965.

SWMU 01-001(b), Septic Tank 135

Septic Tank 135, 7 ft by 3.5 ft by 5 ft deep, made of reinforced concrete, was installed in 1950 and removed in 1977 (LANL 2001, 069946, p.35). It served buildings FP and M-1 and discharged to Los Alamos Canyon. Building FP, a wood-frame and steel building, 40 ft by 122 ft by 20 ft high, constructed in 1945 (LANL 2001, 069946), was a foundry for nonradioactive and nonferrous metals (Ahlquist et al. 1977, 005710, p. 129). Building M-1 was 70 ft by 32 ft with a concrete floor (LANL 2001,

069946) and was completed in 1950 to machine lithium and later to machine uranium-238 (Ahlquist et al. 1977, 0005710, p. 133).

SWMU 01-001(c), Septic Tank 137

Septic Tank 137, 3 ft by 6 ft by 5 ft deep, made of reinforced concrete, was installed in 1947 (LANL 2001, 069946, p. 36; Ahlquist et al. 1977, 005710, p. 49) to serve building D-2, an electronic shop (Ahlquist et al. 1977, 005710, p. 128). Building D-2 was used as a laundry for radioactively contaminated clothing and recyclable equipment until the laundry operations were relocated to TA-21 in 1945 (Ahlquist et al. 1977, 005710, p. 49). The outfall discharged over the canyon rim and the hillside is now designated as Hillside 137. The tank was located in 1975 and found to be a cylindrical metal tank containing water and sludge (Ahlquist et al. 1977, 005710, p. 47). The tank and its outfall pipe were removed (LASL 1976, 008935, pp. 3, 5). Contaminated soil in the areas around building D-2, septic tank 137, and drainlines were also removed (Ahlquist et al. 1977, 005710, pp. 47-49).

SWMU 01-001(e), Septic Tank 139

Septic tank 139, 3 ft by 6 ft by 5 ft deep, made of reinforced concrete and installed in 1944 (LANL 2001, 069946, p. 36), served D-5 Sigma vault, Building I, and Delta building. D-5 Sigma vault was used to store plutonium-239 and uranium-235. Building I was used to store and machine beryllium between 1947 and 1958. Delta Building was used as a meeting place and a laboratory where fission-product tracers were used. The outfall of the tank discharged southeast of building I and D-5 Sigma Vault at the head of Bailey Bridge Canyon. The tank became inactive and was left in place in 1965 (Ahlquist and Bayhurst 1977, 003270, p. 135). Currently, the entire SWMU is under Oppenheimer Drive or residential buildings and their yards, driveways, and sidewalks.

SWMU 01-001(t), Eastern Sanitary Waste Line

SWMU 01-001(t), known as the Eastern Sanitary Waste Line, served buildings Gamma, M, P-Prime, R, S, S-1, T, U, V, W, and Z. Pipelines from the buildings connected to septic tank 1 [SWMU 00-030(b)], which discharged to a drain field southeast of the intersection of DP Road and Trinity Drive. Later, effluent was routed to the Central Wastewater Treatment Plant until it was decommissioned, and then to other Los Alamos County wastewater treatment plants. Former TA-01 was fully decommissioned by 1966, and the Eastern Sanitary Waste Line was left in place. Currently, the entire SWMU is either landscaped (around Ashley Pond) or beneath various streets, parking lots, and commercial buildings.

SWMU 01-001(u), Western Sanitary Waste Line

SWMU 01-001(u) is a branch of the Western Sanitary Waste Line that served building J-2. Former TA-01 was fully decommissioned by 1966, and the Western Sanitary Waste Line was left in place. Currently, the southern portion of the pipeline is under a condominium, the middle portion is in a wooded area behind the condominium, and the northern portion is under a parking lot.

SWMU 01-002, Industrial Waste Line

SWMU 01-002 is located in the southern and western portion of former TA-01. From 1943 to 1951, chemical and radioactive process wastes passed through this line en route to Acid Canyon, a small branch of Pueblo Canyon. SWMU 01-002 includes the area around former buildings (Boiler House 2, D, H, J-2, M, ML, Q, Sigma) and several properties north of Trinity Drive extending to Canyon Road (near

the location of former TA-45). These buildings were the sources of major process discharges from former TA-01 (Ahlquist et al. 1977, 005710, p. 15).

The industrial waste line had two sections: the main industrial waste line south of Trinity Drive ran from building D and the western industrial waste line ran from building J-2 to its junction with the main industrial waste line outside the former TA-01 boundary. From the junction, the line ran north as a single unit to the former TA-45 waste treatment plant. Currently, the entire SWMU has been developed. The location of the western section is under pavement and buildings of Timber Ridge Condominiums. The location of the eastern section is under pavement and various commercial and residential buildings.

SWMU 01-003(e), Surface Disposal Site

SWMU 01-003(e) is located along the northern wall of Los Alamos Canyon. Discarded material at the site consisted of utility boxes, concrete construction debris, piping, and other miscellaneous objects (DOE 1987, 008663).

SWMU 01-006(d), Drainline and Outfall

SWMU 01-006(d) served building D-3 and discharged to Hillside 137 in the same area as the building D-2 drainlines [SWMU 01-006(c)]. Activities at building D-3 included counting radioactive filter papers from Building H-1 (Ahlquist et al. 1977, 005710, p. 128). During the decontamination of areas of buildings D and D-2, all drainlines were removed along with areas of elevated radioactivity (Ahlquist et al. 1977, 005710, p. 64). Because the main portion of the drainline of building D-3 was located in the building D-2 area, this drainline was most likely removed during the excavation of buildings D and D-2. Currently, the area is undeveloped.

AOC 01-006(g), Storm Water Drainage System

AOC 01-006(g) is the storm water drainage system that served buildings ML, Q, X, D, D-4, and D-7. The storm drain system consisted of three buried conduits that emptied into one open north-south main drain. The main drain discharged approximately 20 ft south of the east side of building X into Los Alamos Canyon. Currently, locations of the pipelines are either under pavement or residential buildings. The outfall is on the hillside of Los Alamos Canyon.

SWMU 01-006(o), Storm Water Drainage System

SWMU 01-006(o) is the storm water drainage system that served buildings A, B, C, H, and Sigma 4. In 1964, the foundation of building C was determined to be radiologically contaminated and was subsequently demolished and disposed of at an unspecified material disposal area. The storm drain near the H-Theta building area was excavated (Ahlquist et al. 1977, 005710, p. 83). The entire area has been completely regraded and rebuilt. Currently, the majority of the SWMU is under pavement and residential buildings.

SWMU 01-007(d), Suspected Subsurface Radiological Contamination

SWMU 01-007(d) refers to four areas of subsurface radiological contamination between buildings H and Theta and west of building Theta because of an overflow of the industrial waste line in 1946. After the overflow, all the contaminated soil that was possible to remove was taken away and a load of gravel and binder was spread to a depth of four inches over the area (Ahlquist et al. 1977, 005710, p. 80). Currently,

the two areas to the west are landscaped with grass and trees and the two areas to the east are under pavement and buildings of Los Ventanas townhouses.

SWMU 01-007(e), Suspected Subsurface Radiological Contamination

SWMU 01-007(e) is a suspected subsurface radiological contamination in the former Sigma building footprint (Ahlquist et al. 1977, 005710, p. 12). Sigma Building was used for machining plutonium, uranium, and thorium and for casting and metallurgy. Currently, the entire area is under pavement and residential buildings.

SWMU 01-007(j), 12 Areas of Suspected Subsurface Radiological Contamination

SWMU 01-007(j) consists of 12 areas of suspected subsurface radiological contamination. These areas, called “spots” when they were located during the Ahlquist radiological survey, are isolated, small areas across former TA-01. Toward the end of the decontamination and decommissioning of former TA-01, a radiological survey of the entire area was undertaken to determine whether any contamination had been missed in preceding cleanup operations. The survey was conducted in March and April 1976 using a phosphor sandwich (phoswich) detector , and 17 contaminated spots (numbered 1 through 17) were located (Ahlquist et al. 1977, 005710, p. 113).

Three spots (Nos. 10, 11, and 12 [Ahlquist et al. 1977, 005710, p. 118]) were designated as SWMU 01-007(i) (LANL 1992, 043454, p. 6-18). SWMU 01-007(i) was granted no further action status in 1994 (EPA 2005, 088464). Two spots (Nos. 16 and 17 [Ahlquist et al. 1977, 005710, p. 118]) were determined to be the result of false-positive readings during the survey (Ahlquist et al. 1977, 005710, p.117) and were discounted.

SWMU 01-007(j) is comprised of the remaining 12 spots (No. 1 through 9 and 13 through 15), and they are in highly developed areas with buildings, sidewalks, and roads.

AOC 01-007(k), Soil Contamination Area

AOC 01-007(k) was a suspected soil contamination area located near the U and W buildings (LANL 1992, 043454, p. 1-13). In 1959, buildings U and W were removed from service (Ahlquist et al. 1977, 005710, p. 131). Currently, the area is developed with the structures and parking lots of the Los Alamos Inn.

G-2.1.3 TA-03, South Mesa Site

TA-03 is located on the western end of South Mesa and is almost completely developed. It contains the core of operational facilities at the Laboratory. Several buildings dominate the site: the Administrative Building (03-043), the Otowi Building (03-261), the Chemistry and Metallurgy Research (CMR) Building (03-029), the Physics Building complex (03-040 and 03-215), the main shops building (03-039), and the central warehouse (03-030). Medium-sized and smaller buildings and transportable buildings are interspersed throughout the site. A gas-fired electrical generating plant, gas station and garage, and sewage treatment plant are also located at TA-03.

SWMU 03-009(j), Surface Disposal Site

SWMU 03-009(j) is an area located west of a warehouse (building 03-142). Interviews with workers indicate that the soil/fill contains construction debris consisting of tuff, concrete, rock, and other construction-related items (Griggs 1993, 076167). The SWMU report notes that an old water tank could

also comprise the fill material (LANL 1990, 007511). The site was never used to manage hazardous wastes or constituents. No suspected contaminants are at the site. Currently, the area is partially under a paved road/parking to the Laboratory's Wellness Center (building 03-1663).

G-2.1.4 Former TA-32, Medical Research Laboratory

The site of former TA-32 is located on the south side of East Mesa. The site is bounded approximately by 9th Street to the east, Knecht Street to the west, Trinity Drive to the north, and Los Alamos Canyon to the south. The medical research and training facilities for the Laboratory were located at former TA-32 between the years 1944 and 1954. The area consisted of laboratories, an office building, warehouses, an incinerator, two septic tanks, a valve house, and a transformer station. All of the structures at former TA-32 were removed after 1954. The site is currently used by the Los Alamos County Roads Division to store equipments and materials for road work and road maintenance.

SWMU 32-001, Incinerator (Former Location)

This SWMU is the former location of an incinerator that adjoined the northeast corner of the medical research and training facility's main building (former building 32-1). The incinerator was constructed of brick and was 2.5-ft wide by 2.5-ft long by 10-ft high (LANL 1990, 007513, p. 32-2). The incinerator received combustible wastes from the medical research facility, and the ash was disposed of off-site by the Zia Company (LANL 1996, 052928, p. 10). The operation period of the incinerator was from 1948 to 1954; it was removed in 1954. Currently, SWMU 32-001 is located beneath asphalt in the current working area of the Los Alamos County Public Works Department Pavement Management Division.

AOC 32-004, Drainline and Outfall

AOC 32-004 is a former drainline and outfall from an office building (former building 32-03). Building 32-03 included a vault room where a radioactive source was stored. The drainline led directly to an outfall located at the edge of the mesa and did not pass through a septic tank. AOC 32-004 was discovered in 1993 during a Phase I RFI and further investigation was recommended (LANL 1995, 048944, p. 52). Currently, the mesa-top portion of the AOC is beneath the asphalt parking area of the Los Alamos County Roads Division, and the outfall portion of the AOC is located on undeveloped DOE property.

G-2.1.5 TA-41, W Site

TA-41 has been continuously used from the early 1940s to the present. The site has been used for testing, monitoring, assembling, and storing of nuclear weapon components, for weapons subsystems and boosting systems development, and for long term studies on weapons subsystems. Most of the past work with plutonium at TA-41 involved metal alloys that were clad with an inert metal such that no alpha activity could escape. From 1954 to 1973, isotopic analyses of Nevada Test Site samples containing plutonium and uranium were performed at TA-41. The work was performed with two mass spectrometers located on the bottom floor at the west and east ends of building 41-04. In addition to these radioactive samples, isotopic analyses were also performed for plutonium-238, resulting in several instances of contamination, primarily in the hood area. One of the original mass spectrometers became alpha-contaminated and was removed. Operations at TA-41 required use of radioactive materials, toxic gases, mercury, and various organic chemicals. Materials used or stored at the site included uranium, plutonium, tritium, lithium isotopes, mercury, beryllium, lead and cadmium for shielding, nickel-cadmium and mercury batteries, explosives, and thermite type heat generators. There were also office and photographic laboratory facilities in the area.

SWMU 41-001, Septic System

SWMU 41-001 is an inactive septic tank (structure 41-11) that received sanitary waste from a guardhouse (structure 41-2) from 1949 to 1953. The tank is connected via a 4-in. vitrified-clay pipe (VCP) to the guardhouse. The original guard house has been removed, but the sewer pipe and septic tank are believed to remain in place. The overflow from the tank emptied into a single 4-in. drain tile line that is approximately 60 ft long. The drain tile line runs from west to east, beginning at the fence gate to the west. Archival information from 1986 indicates that a septic tank at TA-41 was contaminated with plutonium, uranium, and tritium (Balo and Warren 1986, 007419, p. 61). It is not known if the septic tank referred to was structure 41-11 or another septic tank at TA-41. It is unlikely that sewage from a guard house would contain radioactive contamination. It is more likely that contamination would be affiliated with building 41-04, where radioactive material was handled. Fill has been placed over the septic system area (LANL 1993, 015314, p. 7-14.1).

Currently, the guardhouse is not being used and is designated as a historical building. The pipeline path is partially under asphalt pavement, partially in undeveloped land, and the septic tank is in undeveloped land. The nearby building 41-04 and the underground storage vault (building 41-01) are used.

G-2.1.6 TA-43, Health Research Laboratory

TA-43 was established in 1953 when the Laboratory's former Health Division, which conducted biomedical and industrial hygiene research, first occupied Health Research Laboratory (HRL) (building 43-01) (DOE 1987, 008663). The work conducted at the HRL was a mixture of basic and applied research to assess the health effects of radiation and materials associated with Laboratory operations (DOE 1987, 008663). Industrial hygiene activities were relocated to TA-59 in 1966. Since then, the focus at the HRL has been on biomedical research conducted by the Life Sciences (LS) Division [now Bioscience (B) Division]. Work includes diverse experiments at the molecular, cellular, and whole-body levels.

AOC 43-001(b2), Outfall

AOC 43-001(b2) is a storm-drain outfall permitted in the mid-to-late 1970s under the Laboratory's National Pollutant Discharge Elimination System (NPDES) permit Outfall 03A040 and removed from the permit on January 11, 1999. The outfall received effluent from six floor drains in the sub-basement at the HRL (building 43-01), blow-down from the evaporative cooler, and storm water from 13 roof drains on the west side of the HRL (Santa Fe Engineering Ltd. 1992, 058455). The effluents discharged west of the HRL through a 130-ft. long, 12-in. corrugated metal pipe to Los Alamos Canyon. The outfall may have historically discharged radioactively contaminated water and/or once-through and treated cooling water (DOE 1987, 008663). No quantitative information is available about possible residual contamination as a result of the discharges from this outfall. Currently, the outfall is located on the undeveloped slope of Los Alamos Canyon west of the HRL.

G-2.2 Determination of Chemicals of Potential Concern

Appendix F summarizes the chemicals of potential concern (COPC) selection process and provides a data summary. Only COPCs identified in Appendix F detected above background (inorganic chemicals and radionuclides), had detection limits greater than background values (BVs) (inorganic chemicals), and detected organic chemicals or fallout radionuclides detected in tuff were retained. The industrial scenario and the recreational scenarios typically utilize data from samples collected from 0–1 ft below ground surface (bgs). The ecological evaluation typically utilizes data from samples collected from 0–5 ft bgs. The

construction worker and the residential scenarios typically utilize data from samples collected from 0–10 ft bgs. However, sampling depths often overlapped from multiple investigations; therefore, all samples with a starting depth less than the lower bound of the interval for each scenario were included in the risk assessments.

Tables G-2.2-1 to G-2.2-37 summarize the COPCs evaluated for potential risk for each site in the Upper Los Alamos Canyon Aggregate Area. Some of the COPCs identified in Appendix F may not be evaluated for potential risk under one or more scenarios because they were not within any of the specified depth intervals associated with a given scenario.

G-3.0 CONCEPTUAL SITE MODEL

The sites investigated as part of the Upper Los Alamos Canyon Aggregate Area are of four types of release mechanisms. The first type is industrial waste lines, sanitary waste lines, septic tanks, holding tanks, drainlines, and storm drains. The second type is potentially contaminated subsurface soil. The third type is outfalls to the hillsides. The fourth type is surface disposal areas and landfills. The primary mechanisms of release are related to historical contaminant sources summarized in section 2.3 of the investigation report.

The lack of saturated conditions in the source area restricts the vertical migration of contaminants. No zones of perched groundwater have been identified beneath Upper Los Alamos Canyon Aggregate Area.

G-3.1 Receptors and Exposure Pathways

The primary exposure for human receptors is from surface soil and subsurface soil/tuff that may be brought to the surface through intrusive activities. Migration of contamination to groundwater through the vadose zone is unlikely given the depth to groundwater (greater than 1000 ft bgs) at the site. Human receptors (industrial, recreational, construction worker, and residential) may be exposed through direct contact with soil or suspended particulates by ingestion, inhalation, dermal contact, and external irradiation pathways. Direct contact exposure pathways from subsurface contamination to human receptors are complete for the resident and the construction worker, where appropriate. The exposure pathways are the same as those for surface soil. In addition, the vapor intrusion pathway from subsurface VOCs in soil and tuff was evaluated for the residential scenario. Sources, exposure pathways, and receptors are shown in the conceptual site model (CSM) (Figure G-3.1-1).

The sites of the Upper Los Alamos Canyon Aggregate Area are in residential areas, on the slopes or bottoms of canyons, in the business areas of Los Alamos, or on Laboratory property. The sites provide potential habitat for ecological receptors, except where sites are covered with asphalt and buildings. For unpaved sites or areas of sites, exposure pathways are complete to surface soil and tuff for ecological receptors. Exposure is assessed across the site to a depth of 0–5 ft. Weathering of tuff is the only viable natural process that may result in the exposure of receptors to COPCs in tuff. However, because of the slow rate of weathering expected for tuff, exposure to COPCs in tuff is negligible, although it is included in the assessments. Exposure pathways to subsurface contamination below 5 ft are not complete unless contaminated soil or tuff were excavated and brought to the surface. The potential pathways are root uptake by plants, inhalation of vapors (burrowing animals only), inhalation of dust, dermal contact, incidental ingestion of soil, external irradiation, and food web transport. Surface water was not evaluated because of the lack of surface water features. Sources and exposure pathways are presented in the CSM (Figure G-3.1-1).

G-3.2 Environmental Fate and Transport

The evaluation of environmental fate addresses the chemical processes affecting the persistence of a chemical in the environment, and the evaluation of transport addresses the physical processes affecting mobility along a migration pathway. Transport through soil and tuff depends on properties such as soil pH, rate of precipitation or snowmelt, soil moisture content, soil/tuff hydraulic properties, and properties of the COPCs. Migration into and through tuff also depends on the unsaturated flow properties of the tuff and the presence of joints and fractures.

The most important factor with respect to the potential for COPCs to migrate to groundwater is the presence of saturated conditions. Downward migration in the vadose zone is limited also by a lack of hydrostatic pressure. Without sufficient moisture, little or no potential migration of materials through the vadose zone to groundwater occurs.

Contamination at depth is addressed in the discussion of nature and extent (Appendix F). Results from the deepest samples collected showed either no detected concentrations of COPCs or low/trace-level concentrations of only a few inorganic, radionuclide, and/or organic COPCs in tuff. The limited extent of contamination is related at least in part to the absence of the key factors that facilitate migration, as discussed above. Given how long the contamination has been present in the subsurface, the physical and chemical properties of the COPCs, and the lack of saturated conditions, the potential for contaminant migration to the groundwater is very low.

The New Mexico Environment Department (NMED) guidance (NMED 2006, 092513) contains screening levels that consider the potential for contaminants in soil to result in groundwater contamination. These screening levels consider equilibrium partitioning of contaminants among solid, aqueous, and vapor phases and account for dilution and attenuation in groundwater through the use of dilution attenuation factors (DAFs). These DAF soil screening levels (SSLs) can be used to identify chemical concentrations in soil that have the potential to contaminate groundwater (EPA 1996, 059902). Screening contaminant concentrations in soil against these DAF SSLs does not, however, provide an indication of the potential for contaminants to migrate to groundwater. The assumptions used in the development of these DAF SSLs include an assumption of uniform contaminant concentrations from the contaminant source to the water table (i.e., it is assumed that migration to groundwater has already occurred). Furthermore, this assumption is inappropriate for cases such as Upper Los Alamos Canyon Aggregate Area where sampling has shown that contamination is vertically bounded near the surface and the distance from the surface to the water table is large. For these reasons, screening of contaminant concentrations in soil against the DAF SSLs was not performed.

The best indication of the potential for future contaminant migration to groundwater is the current vertical distribution of contaminants in the subsurface. Most releases within the Upper Los Alamos Canyon Aggregate Area are historical (i.e., they occurred decades ago). The depth to the regional aquifer beneath the aggregate area is greater than 1000 ft bgs. Therefore, for migration of contaminants to occur from shallow soil to the regional aquifer in a meaningful time frame (e.g., 100 to 1000 yr), significant vertical migration should have already occurred. Sampling has shown that this migration has not occurred, indicating a very low potential for future contaminant migration to groundwater.

The relevant release and transport processes of the COPCs are a function of chemical-specific properties that include the relationship between the physical form of the constituents and the nature of the constituent transport processes in the environment. Specific properties include the degree of saturation, the potential for ion exchange or sorption, and the potential for natural bioremediation. The transport of volatile organic compounds (VOCs) occurs primarily in the vapor phase by diffusion or advection in

subsurface air. The chemical and physical properties of the Upper Los Alamos Canyon Aggregate Area COPCs are presented in Tables G-3.2-1, G-3.2-2, and G-3.2-3.

The primary release and transport mechanisms that may lead to the potential exposure of receptors in the Upper Los Alamos Canyon Aggregate Area include

- dissolution and/or particulate transport of surface contaminants from precipitation and runoff,
- airborne transport of contaminated surface soil or particulates,
- continued dissolution and advective/dispersive transport of chemical and radiological contaminants contained in subsurface soil and bedrock,
- biotic perturbation and/or translocation of contaminants in subsurface contaminated media, and
- uptake of contaminants from soil and water by biota.

Contaminant distributions at the sites indicate that after the initial deposition of contaminants from operational activities and historical remediation efforts, elevated levels of contaminants tend to remain concentrated in the vicinity of the original release points.

G-3.2.1 Inorganic Chemicals

In general, and particularly in a semiarid climate such as the Upper Los Alamos Canyon Aggregate Area, inorganic chemicals are not highly soluble or mobile in the environment. The primary physical and chemical factors that determine and describe the distribution of inorganic COPCs within the soil and tuff are the water solubility of the inorganic chemical and the soil-water partition coefficient (K_d). Other factors besides the K_d values, such as speciation in soil and oxidation/reduction potential (Eh) potential and pH, also play a role in the likelihood that inorganic chemicals will migrate. The K_d values provide a general assessment of the potential for migration through the subsurface; chemicals with higher K_d values are less likely to be mobile than those with lower K_d values. Inorganic chemicals with K_d values greater than 40 are very unlikely to migrate through soil towards the water table (Kincaid et al. 1998, 093270). Table G-3.2-1 presents the K_d values for the inorganic COPCs identified within the Upper Los Alamos Canyon Aggregate Area. Based on this criterion, aluminum, antimony, barium, beryllium, cadmium, chromium, cobalt, lead, manganese, mercury, nickel, thallium, vanadium, and zinc have a very low potential to mobilize and migrate through soil and the vadose zone. The K_d values for arsenic, copper, cyanide, iron, nitrate, perchlorate, selenium, and silver are less than 40 and may indicate that these inorganic chemicals have a greater potential to mobilize and migrate through soil and the vadose zone.

These COPCs are discussed further in the following sections. Information about the fate and transport properties of inorganic chemicals was obtained from individual chemical profiles published by the Agency for Toxic Substances and Disease Registry (ATSDR) (ATSDR 1997, 056531). Information for these inorganic chemicals is also available from the ATSDR website at http://www.atsdr.cdc.gov/toxpro2.html.

- Aluminum is the most abundant metal and the third most abundant element in the Earth's crust. It is never found free in nature and is found in most rocks, particularly igneous rocks. The behavior of aluminum in the environment depends upon its coordination chemistry and the characteristics of the local environment, especially pH.
- Arsenic may undergo a variety of reactions including oxidation-reduction reactions, ligand exchange, precipitation, and biotransformation. Arsenic forms insoluble complexes with iron, aluminum, and magnesium oxides commonly found in soil, and in this form, arsenic is relatively immobile. However, under low pH and reducing conditions, arsenic can become soluble and may

potentially leach into groundwater or result in runoff of arsenic into surface waters. Arsenic is expected to have low mobility under the environmental conditions (pH varies from 4.9 to 9.1) present within the Upper Los Alamos Canyon Aggregate Area.

- Copper movement in soil is determined by physical and chemical interactions with the soil components. Most copper deposited in soil is strongly adsorbed and remains in the upper few centimeters. Copper will adsorb to organic matter, carbonate minerals, clay minerals, hydrous iron, and manganese oxides. In most temperate soil, pH, organic matter, and ionic strength of the soil solutions are the key factors affecting adsorption. Copper binds to soil much more strongly than other divalent cations, and the distribution of copper in the soil solution is less affected by pH than other metals. Copper is expected to be bound to the soil and move in the system by way of transport of soil particles by water as opposed to movement as dissolved species.
- Cyanide in soil biodegrades at low concentrations under aerobic conditions with the initial formation of ammonia, which is converted to nitrate and nitrite in the presence of nitrifying bacteria. Under anaerobic conditions, the cyanide ion denitrifies to gaseous nitrogen.
- Iron is naturally occurring in soil and tuff and may be relatively mobile under reducing conditions.
- Nitrate is highly soluble in water and may migrate with water molecules in saturated soil. As noted above, the subsurface material beneath the Upper Los Alamos Canyon Aggregate Area has low moisture content, which would inhibit the mobility of nitrate as well as most other inorganic chemicals.
- Perchlorate is soluble in water and may migrate with water molecules in saturated soil. As noted above, the subsurface material beneath the Upper Los Alamos Canyon Aggregate Area has low moisture content, which would inhibit the mobility of perchlorate as well as most other inorganic chemicals.
- Selenium is not often found in the environment in its elemental form but is usually combined with sulfide minerals or with silver, copper, lead, and nickel minerals. In soil, pH and Eh are determining factors in the transport and partitioning of selenium. In soil with a pH of greater than 7.5, selenates, which have high solubility and a low tendency to adsorb onto soil particles, are the major selenium species and are very mobile. The pH within the Upper Los Alamos Canyon Aggregate Area varies from 4.9 to 9.1, which indicates that selenium may migrate in this soil.
- Silver sorbs onto soil and sediment and tends to form complexes with inorganic chemicals and humic substances in soil. The presence of organic matter complexes with silver and reduces its mobility. Silver compounds tend to leach from well-drained soils, and if sufficient hydrostatic pressure exists, silver could potentially migrate into the subsurface.
- Thallium is generally soluble in water, and tends to be sorbed to soil and sediment.
- Zinc is an element commonly found in the earth's crust. Zinc does not volatilize from soil or water, but is deposited primarily in sediment through adsorption and precipitation.

G-3.2.2 Radionuclides

Radionuclides are generally not highly soluble or mobile in the environment, particularly in the semiarid climate of the Laboratory. The physical and chemical factors that determine the distribution of radionuclides within soil and tuff are the K_d, the pH of the soil and other soil characteristics (e.g., sand or clay content), and the oxidation/reduction potential (Eh). The interaction of these factors is complex, but K_d values provide a general assessment of the potential for migration through the subsurface: chemicals with higher K_d values are less likely to be mobile than those with lower values. Radionuclides with K_d

values greater than 40 are very unlikely to migrate through soil towards the water table (Kincaid et al. 1998, 093270).

Table G-3.2-2 gives physical and chemical properties of the radionuclide COPCs identified within the Upper Los Alamos Canyon Aggregate Area. Based on K_d values, americium-241, cesium-134, cesium 137, plutonium-238, and plutonium 239/240 have a very low potential to migrate towards groundwater. The K_d values for strontium-90, tritium, uranium-234, uranium-235/236, and uranium-238 are less than 40 and indicate a potential to migrate towards groundwater.

Americium-241 deposited on soil strongly attaches to soil particles, and does not travel very far into the ground. Ultimately, most americium ends up in soil or sediment.

A major portion of stable and radioactive strontium in soil dissolves in water, so it might move deeper into the subsurface. However, the K_d value of 35 indicates that strontium-90 is relatively immobile in the subsurface.

Retention of uranium by soil may be due to adsorption, chemisorption, ion exchange, or a combination of these mechanisms. The sorption of uranium in most soil is such that it may not leach readily from soil surface to groundwater, particularly in soil containing clay and iron oxide.

Tritium's initial behavior in the environment is determined by the source. If tritium is released in liquid form, the tritium is subject to physical dispersion, percolation, and evaporation (Whicker and Schultz 1982, 058209). Because the tritium migrates in association with moisture, the low moisture content of the Upper Los Alamos Canyon Aggregate Area subsurface limits the potential for tritium to migrate to groundwater.

G-3.2.3 Organic Chemicals

Table G-3.2-3 presents the physical and chemical properties (organic carbon-water partition coefficient [K_{oc}], logarithm to the base 10 octanol/water partition coefficient [log K_{ow}], and solubility) of the organic COPCs identified within the Upper Los Alamos Canyon Aggregate Area. The physical and chemical properties of organic chemicals are important when evaluating their fate and transport. The following information illustrates some aspects of the fate and transport tendencies of the Upper Los Alamos Canyon Aggregate Area COPCs. The information is summarized from Ney (1995, 058210).

Water solubility may be the most important chemical characteristic used to assess mobility of organic chemicals. The higher the water solubility of a chemical, the more likely it is to be mobile and the less likely it is to accumulate, bioaccumulate, volatilize, or persist in the environment. A highly soluble chemical (water solubility greater than 1000 mg/L) is prone to biodegradation and metabolism that may detoxify the parent chemical. Acetone, benzene, benzoic acid, benzyl alcohol, bromomethane, butanone[2-], carbon disulfide, chloroform, chloromethane, hexanone[2-], methylene chloride, trichlorofluoromethane, and vinyl chloride have water solubilities greater than 1000 mg/L.

The lower the water solubility of a chemical, especially below 10 mg/L, the more likely it will be immobilized by adsorption. Chemicals with lower water solubilities are more likely to accumulate or bioaccumulate and persist in the environment, to be slightly prone to biodegradation, and to be metabolized in plants and animals. The COPCs identified as having water solubilities less than 10 mg/L are acenaphthene, anthracene, Aroclor-1248, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, bis[2-ethylhexyl]phthalate, butylbenzylphthalate, carbazole, chrysene, dibenz[a,h]anthracene,

dibenzofuran, di-n-octylphthalate, fluoranthene, fluorene, indeno[1,2,3-cd]pyrene, phenanthrene, pyrene, and 2,3,7,8-tetrachlorodibenzodioxin (TCDD).

Vapor pressure is a chemical characteristic used to evaluate the tendency of organic chemicals to volatize. Chemicals with vapor pressure greater than 0.01 millimeters of mercury (mm Hg) are likely to volatilize, and therefore, concentrations at the site are reduced over time; vapors of these chemicals are more likely to travel toward the atmosphere and not migrate toward groundwater. Acetone, benzene, benzyl alcohol, bromobenzene, bromomethane, butanone[2-], butylbenzene[n-], butylbenzene[sec-], butylbenzene[tert-], carbon disulfide, chloroform, chloromethane, chlorotoluene[4-], dichlorobenzene[1,2-], dichlorobenzene[1,3-], dichlorodifluoromethane, ethylbenzene, hexanone[2-], methylene chloride, styrene, tetrachloroethene, toluene, trichloro-1,2,2-trifluoroethane[1,1,2-], trichlorofluoromethane, trimethylbenzene[1,2,4-], trimethylbenzene[1,3,5-], vinyl chloride, xylene[1,2-], xylene[1,3-], xylene[1,3] + xylene[1,4-], and xylene(total) have vapor pressures greater than 0.01 mm Hg.

Chemicals with vapor pressures less than 0.000001 mm Hg are less likely to volatilize and, therefore, tend to remain immobile. Benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, bis[2 ethylhexyl]phthalate, carbazole, chrysene, dibenz[a,h]anthracene, di-n-octylphthalate, and indeno[1,2,3-cd]pyrene have vapor pressures less than 0.000001 mm Hg.

The K_{ow} is an indicator of a chemical's potential to bioaccumulate or bioconcentrate in the fatty tissues of living organisms. The unitless K_{ow} value is an indicator of water solubility, mobility, sorption, and bioaccumulation. The higher the K_{ow} is above 1000, the greater the affinity the chemical has for bioaccumulation in the food chain, the greater its potential for sorption in the soil, and the lower its mobility (Ney 1995, 058210). The COPCs with a K_{ow} greater than 1000 include acenaphthene, acenaphthylene, anthracene, Aroclor-1248, Aroclor-1254, Aroclor-1260, benzene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, bis[2 ethylhexyl]phthalate, chrysene, dibenz[a,h]anthracene, di-n-butylphthalate, di-n-octylphthalate, ethylbenzene, fluoranthene, fluorene, indeno[1,2,3-cd]pyrene, methylnaphthalene[2-], naphthalene, phenanthrene, pyrene, tetrachloroethene, trimethylbenzene[1,2,4], trimethylbenzene[1,3,5-], xylene[1,2-], xylene[1,3-] + xylene[1,4-], and xylene(total). A K_{ow} of less than 500 indicates high water solubility, high mobility, little to no affinity for bioaccumulation, and degradability by microbes, plants, and animals. Acetone, benzoic acid, butanone[2], chloroform, dichloroethene[1,1-], dichloroethene[cis-1,2-], hexanone[2-], methyl-2-pentanone[4-], methylene chloride, and trichlorofluoromethane have a K_{ow} less than 500.

The K_{oc} measures the tendency of a chemical to adsorb to organic carbon in soil. K_{oc} values above 500 L/kg indicate a strong tendency to adsorb to soil, leading to low mobility. Acenaphthene, acenaphthylene, anthracene, Aroclor-1248, Aroclor-1254, Aroclor-1260, benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, bis[2-ethylhexyl]phthalate, chrysene, dibenz[a,h]anthracene, di-n-butylphthalate, di n-octylphthalate, ethylbenzene, fluoranthene, fluorene, indeno[1,2,3-cd]pyrene, methylnaphthalene[2-], naphthalene, phenanthrene, pyrene, styrene, TCDD[2,3,7,8-], trimethylbenzene[1,2,4-] and trimethylbenzene[1,3,5-] have K_{oc} values above 500 L/kg, indicating a very low potential to migrate toward groundwater. The COPCs with K_{oc} values less than 500 L/kg are acetone, benzene, benzoic acid, butanone[2-], carbon disulfide, chloroform, chloromethane, dichlorobenzene[1,2-], dichlorodifluoromethane, hexanone[2-], methylene chloride, tetrachloroethene, toluene, trichloro-1,2,2-trifluoroethane[1,1,2-], trichlorofluoromethane, xylene[1,2-], xylene[1,3-] + xylene[1,4-], and xylene(total).

Acenaphthene, anthracene, Aroclor-1248, Aroclor-1254, Aroclor-1260, benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, bis[2 ethylhexyl]phthalate, chrysene, dibenz[a,h]anthracene, di-n-octylphthalate, fluoranthene, fluorene, phenanthrene, pyrene, and TCDD[2,3,7,8-] are the least mobile and the most likely to bioaccumulate. The more soluble and volatile

COPCs acetone, benzoic acid, butanone[2-], chloroform, dichlorobenzene[1,2-], hexanone[2-], methylene chloride, tetrachloroethene, toluene, trichlorofluoromethane, xylene[1,2-], xylene[1,3-] + xylene[1,4-] and xylene(total) are more mobile but are also more likely to travel toward the atmosphere and not migrate toward groundwater. Because the organic COPCs were detected at low concentrations, they are not likely to migrate to groundwater.

G-3.2.4 Summary

Saturation is the primary factor in determining the potential for COPCs to migrate to groundwater. Based on investigation results, saturated conditions are not present beneath the Upper Los Alamos Canyon Aggregate Area. The lack of saturated conditions and hydrostatic pressure severely limits the movement of contamination toward groundwater within the Upper Los Alamos Canyon Aggregate Area. Without sufficient moisture, little or no potential migration of materials occurs through the vadose zone to groundwater. As a result, the potential for COPC migration to groundwater is very low based on the site conditions, the physical/chemical properties of the COPCs, and the distance to the regional aquifer below the site.

G-3.3 Exposure Point Concentration Calculations

The exposure point concentrations (EPCs) represent upper bound concentrations of COPCs. For comparison to risk screening levels, the upper confidence level (UCL) of the arithmetic mean was calculated and used as the EPC. If an appropriate UCL of the mean could not be calculated or if the UCL exceeded the maximum concentration, the maximum detected concentration of the COPC was used as the EPC. The EPCs for dioxin and furan congeners are the sum of the detected congeners weighted by the World Health Organization 1995 toxic equivalent factors (TEFs) (http://www.epa.gov/ncea/pdfs/dioxin/part2/drich9.pdf); the sum is expressed as the TCDD[2,3,7,8-] equivalent. The EPCs are shown in Tables G-2.2-1 through G-2.2-37.

Calculation of the UCLs of the mean concentration was done using the EPA ProUCL 4.00.02 software (EPA 2007, 096530), which is based on EPA guidance (EPA 2002, 085640). The ProUCL program calculates 95%, 97.5%, and 99% UCLs and recommends a distribution and UCL. The UCL for the recommended calculation method was used as the EPC. The ProUCL software performs distributional tests on the data set for each COPC and calculates the most appropriate UCL based on the distribution of the data set. Environmental data may have a normal, lognormal, or gamma distribution but are often nonparametric (no definable shape to the distribution). Input and output data files for ProUCL calculation are provided on DVD as Attachment G-1.

G-4.0 HUMAN HEALTH RISK SCREENING ASSESSMENTS

The human health risk screening assessments were conducted for 25 of the sites within the Upper Los Alamos Canyon Aggregate Area. All 25 sites were screened using the residential scenario. Individual sites were also screened for the industrial, construction worker, and/or the recreational scenarios based on the current and reasonably foreseeable future land use. Both industrial and recreational risk screening assessments used data from 0–1 ft bgs, while the construction worker and residential risk screening assessments used data from 0-10 ft bgs. The exposure scenarios evaluated for each site are summarized in Table G-4.0-1.

G-4.1 Soil Screening Levels

Human health risk screening assessments for chemical COPCs were conducted using the residential, construction worker, and industrial SSLs obtained from NMED guidance (NMED 2006, 092513) or U.S. Environmental Protection Agency (EPA) regional screening level table (available at http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm). The EPA screening levels for carcinogens were multiplied by 10 to adjust the screening levels to the NMED target cancer risk level of 1×10^{-5}. SSLs for the recreational scenario were obtained from Laboratory guidance (LANL 2007, 094496). For some COPCs, saturation limit SSLs are provided in NMED guidance (NMED 2006, 092513), which are not risk-based values. In the risk screening tables in this appendix, the risk-based values from the EPA regional table (for the residential and industrial scenarios) or from LANL (for the recreational scenario) have been substituted to determine the potential risks. Radionuclide screening action levels (SALs) are used for screening radionuclide COPCs and were derived using the residual radioactivity (RESRAD) computer code, Version 6.21 (LANL 2005, 088493). The SALs are based on a 15 mrem/yr dose per DOE guidance (DOE 2000, 067489). Exposure parameters used to calculate the recreational, industrial, construction worker, and residential SSLs and SALs are presented in Tables G-4.1-1 to G-4.1-3.

In addition, the potential for vapor intrusion of VOCs into a building was evaluated for the residential scenario. The potential risk was assessed using the Johnson and Ettinger model (http://www.epa.gov/swerrims/riskassessment/airmodel/johnson_ettinger.htm) for subsurface vapor intrusion into buildings (EPA 2002, 094114). Because only soil data are available for the sites in the Upper Los Alamos Canyon Aggregate Area, the advanced soil model (SL-ADV-Feb04.xls) was used to calculate risk-based soil concentrations for VOCs at sites, where appropriate. The maximum detected concentration of each VOC COPC was compared to the risk-based concentration generated by the model for each site. The model inputs and risk-based concentrations generated are provided in Attachment G-2. HQs and HIs were calculated for noncarcinogenic COPCs and total excess cancer risks for carcinogenic COPCs. The NMED target cancer risk level of 1×10^{-5} and NMED target HI of 1.0 were applied.

G-4.2 Results of the Human Health Risk Screening Assessments

The EPC of each COPC was compared with the SSLs for the appropriate scenario(s). For carcinogenic chemicals, the EPCs were divided by the SSL and then multiplied by 1×10^{-5}. The sum of the cancer risks was compared with the NMED target cancer risk level of 1×10^{-5}. For noncarcinogenic chemicals, a hazard quotient (HQ) was generated for each COPC by dividing the EPC by the SSL. The HQs were summed to generate a hazard index (HI). The HI was compared with the NMED target HI of 1.0. For radionuclides, the EPC was divided by the SAL and multiplied by 15 mrem/yr to calculate the dose. The sum of the doses was compared with the DOE target dose level of 15 mrem/yr (DOE 2000, 067489). The results of the human health risk screening evaluations for the Upper Los Alamos Canyon Aggregate Area sites are presented in Tables G-4.2-1 to G-4.2-123.

G-4.2-1 AOC 00-031(a)

The results of the risk screening assessments for the residential scenario are presented in Tables G-4.2-1 and G-4.2-2. The total excess cancer risk is approximately 2×10^{-9}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.02, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide COPCs for this site.

Total petroleum hydrocarbons–gasoline range organics (TPH-GRO) was detected in one of six samples at SWMU 00-031(a) and was screened using NMED's TPH screening guidelines (NMED 2006, 094614, Table 2a). The maximum detected concentration for TPH-GRO is 0.18 mg/kg. TPH-GRO was screened

with the screening guideline for unknown oil with a residential direct exposure value of 200 mg/kg. The resulting HQ is 0.0009, which indicates no potential risk from the TPH-GRO detected.

The results of the residential vapor intrusion screening assessments are presented in Tables G-4.2-3 and G-4.2-4. The total excess cancer risk is approximately 7×10^{-7}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.7, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

G-4.2-2 SWMU 01-001(b)

The results of the risk screening assessments for the recreational scenario are presented in Tables G-4.2-5, G-4.2-6, and G-4.2-7. The total excess cancer risk is approximately 1×10^{-7}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.03, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.02 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The results of the risk screening assessments for the residential scenario are presented in Tables G-4.2-8, G-4.2-9, and G-4.2-10. The total excess cancer risk is approximately 2×10^{-7}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.1, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.6 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The results of the residential vapor intrusion screening assessments are presented in Tables G-4.2-11 and G-4.2-12. The total excess cancer risk is approximately 5×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.0007, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

G-4.2-3 SWMU 01-001(c)

The results of the risk screening assessments for the industrial scenario are presented in Tables G-4.2-13, G-4.2-14, and G-4.2-15. The total excess cancer risk is approximately 1×10^{-6}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.06, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.4 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The results of the risk screening assessments for the recreational scenario are presented in Tables G-4.2-16, G-4.2-17, and G-4.2-18. The total excess cancer risk is approximately 6×10^{-7}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.07, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.3 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The results of the risk screening assessments for the construction worker scenario are presented in Tables G-4.2-19, G-4.2-20, and G-4.2-21. The total excess cancer risk is approximately 2×10^{-6}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.3, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 2.4 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The results of the risk screening assessments for the residential scenario are presented in Tables G-4.2-22, G-4.2-23, and G-4.2-24. The total excess cancer risk is approximately 4×10^{-6}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately

0.2, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 2.6 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

Calcium does not have a published toxicity value, but is among those elements identified in section 5.9.4 of Risk Assessment Guidance for Superfund [RAGS] (EPA 1989, 008021) as an essential macronutrient. As an essential nutrient, calcium may be compared to the recommended daily allowance (RDA) for adults and children. The RDA is 1200 mg of calcium per day (mg/day) for an adult and 800 mg/d for a child (National Research Council 1989, 064000, pp. 179-181). If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected between 0-10 ft at SWMU 01-001(c) of 1,180 mg/kg, at the EPA default adult soil ingestion rate of 100 mg of soil per day, an adult would ingest approximately 0.2 mg calcium per day. At the intake level of 0.2 mg calcium per day, the adult's ingestion of calcium is less than the RDA for calcium of 1200 mg/day. If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected between 0-10 ft at SWMU 01-001(c) of 1,180 mg/kg, at the EPA default child soil ingestion rate of 200 mg of soil per day, a child would ingest approximately 0.4 mg calcium per day. At the intake level of 0.4 mg calcium per day, the child's ingestion of calcium is less than the RDA for calcium of 800 mg/day. Therefore, no adverse health effects are expected from calcium at 1180 mg/kg, and calcium is eliminated as a COPC.

Magnesium does not have a published toxicity value, but is among those elements identified in section 5.9.4 of RAGS (EPA 1989, 008021) as an essential macronutrient. As an essential nutrient, magnesium may be compared to the RDA for adults and children. The RDA is 310–420 mg of magnesium per day (mg/day) for an adult and 80–240 mg/d for a child (National Research Council 1989, 064000, pp. 179-181). If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected between 0-10 ft at SWMU 01-001(c) of 827 mg/kg, at the EPA default adult soil ingestion rate of 100 mg of soil per day, an adult would ingest approximately 0.12 mg magnesium per day. At the intake level of 0.12 mg magnesium per day, the adult's ingestion of magnesium is less than the RDA for magnesium of 310–420 mg/day. If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected between 0-10 ft at SWMU 01-001(c) of 827 mg/kg, at the EPA default child soil ingestion rate of 200 mg of soil per day, a child would ingest approximately 0.28 mg magnesium per day. At the intake level of 0.28 mg magnesium per day, the child's ingestion of magnesium is less than the RDA for magnesium of 80–240 mg/day. Therefore, no adverse health effects are expected from magnesium at 827 mg/kg, and magnesium is eliminated as a COPC.

The results of the residential vapor intrusion screening assessments are presented in Table G-4.2-25. The HI is approximately 0.0002, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). There are no carcinogenic VOCs detected.

G-4.2-4 SWMU 01-001(e)

The results of the risk screening assessments for the residential scenario are presented in Table G-4.2-26. The HI is approximately 0.00000008, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide or carcinogenic COPCs for this site.

Calcium does not have a published toxicity value, but is among those elements identified in section 5.9.4 of RAGS (EPA 1989, 008021) as an essential macronutrient. As an essential nutrient, calcium may be compared to the RDA for adults and children. The RDA is 1200 mg of calcium per day (mg/day) for an adult and 800 mg/d for a child (National Research Council 1989, 064000, pp. 179-181). If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected between 0-10 ft at SWMU 01-001(e) of 4940 mg/kg, at the EPA default adult soil ingestion rate of 100 mg of soil per day, an adult would ingest approximately 0.7 mg calcium per day. At the intake level of 0.7 mg

calcium per day, the adult's ingestion of calcium is less than the RDA for calcium of 1200 mg/day. If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected between 0–10 ft at SWMU 01-001(e) of 4940 mg/kg, at the EPA default child soil ingestion rate of 200 mg of soil per day, a child would ingest approximately 1.6 mg calcium per day. At the intake level of 1.6 mg calcium per day, the child's ingestion of calcium is less than the RDA for calcium of 800 mg/day. Therefore, no adverse health effects are expected from calcium at 4940 mg/kg, and calcium is eliminated as a COPC.

The results of the residential vapor intrusion screening assessments are presented in Table G-4.2-27. The HI is approximately 0.000003, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). There are no carcinogenic VOCs detected.

G-4.2-5 SWMU 01-001(t)

The results of the risk screening assessments for the residential scenario are presented in Tables G-4.2-28, G-4.2-29, and G-4.2-30. The total excess cancer risk is approximately 4×10^{-6}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.07, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.2 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The results of the residential vapor intrusion screening assessments are presented in Tables G-4.2-31 and G-4.2-32. The total excess cancer risk is approximately 2×10^{-7}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.0003, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

G-4.2-6 SWMU 01-001(u)

The results of the risk screening assessments for the residential scenario are presented in Tables G-4.2-33 and G-4.2-34. The total excess cancer risk is approximately 2×10^{-9}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.08, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide COPCs for this site.

Calcium does not have a published toxicity value, but is among those elements identified in section 5.9.4 of RAGS (EPA 1989, 008021) as an essential macronutrient. As an essential nutrient, calcium may be compared to the RDA for adults and children. The RDA is 1200 mg of calcium per day (mg/day) for an adult and 800 mg/d for a child (National Research Council 1989, 064000, pp. 179-181). If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected between 0–10 ft at SWMU 01-001(u) of 2370 mg/kg, at the EPA default adult soil ingestion rate of 100 mg of soil per day, an adult would ingest approximately 0.34 mg calcium per day. At the intake level of 0.34 mg calcium per day, the adult's ingestion of calcium is less than the RDA for calcium of 1200 mg/day. If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected between 0-10 ft at SWMU 01-001(u) of 2370 mg/kg, at the EPA default child soil ingestion rate of 200 mg of soil per day, a child would ingest approximately 0.8 mg calcium per day. At the intake level of 0.8 mg calcium per day, the child's ingestion of calcium is less than the RDA for calcium of 800 mg/day. Therefore, no adverse health effects are expected from calcium at 2370 mg/kg, and calcium is eliminated as a COPC.

The results of the residential vapor intrusion screening assessments are presented in Tables G-4.2-35 and G-4.2-36. The total excess cancer risk is approximately 1×10^{-8}, which is less than the NMED target

cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.0003, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

G-4.2-7 SWMU 01-002

The results of the risk screening assessments for the residential scenario are presented in Tables G-4.2-37, G-4.2-38, and G-4.2-39. The total excess cancer risk is approximately 3×10^{-7}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.09, which is less than the NMED target of HI 1.0 (NMED 2006, 092513). The total dose is 0.3 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

Calcium does not have a published toxicity value, but is among those elements identified in Section 5.9.4 of Risk Assessment Guidance for Superfund [RAGS] (EPA 1989, 008021) as an essential macronutrient that can be eliminated as a COPC on the basis of best professional judgment. As an essential nutrient, calcium may be compared to the recommended daily allowance (RDA) for adults and children. The RDA is 1200 mg of calcium per day (mg/day) for an adult and 800 mg/d for a child (National Research Council 1989, 064000, pp. 179-181). If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected at SWMU 01-002 of 49,500 mg/kg, at the EPA default adult soil ingestion rate of 100 mg of soil per day, an adult would ingest approximately 7.1 mg calcium per day. At the intake level of 7.1 mg calcium per day, the adult's ingestion of calcium is far less than the RDA for calcium of 1200 mg/day. If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected at SWMU 01-002 of 49,500 mg/kg, at the EPA default child soil ingestion rate of 200 mg of soil per day, a child would ingest approximately 16.5 mg calcium per day. At the intake level of 16.5 mg calcium per day, the child's ingestion of calcium is far less than the RDA for calcium of 800 mg/day. Therefore, no adverse health effects are expected from calcium at 49,500 mg/kg, and calcium is eliminated as a COPC.

The results of the residential vapor intrusion screening assessments are presented in Tables G-4.2-40 and G-4.2-41. The total excess cancer risk is approximately 7×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.0005, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

G-4.2-8 SWMU 01-003(e)

The results of the risk screening assessments for the industrial scenario are presented in Tables G-4.2-42, G-4.2-43, and G-4.2-44. The total excess cancer risk is approximately 2×10^{-6}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.03, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.1 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The results of the risk screening assessments for the recreational scenario are presented in Tables G-4.2-45, G-4.2-46, and G-4.2-47. The total excess cancer risk is approximately 1×10^{-6}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.04, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.04 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The results of the risk screening assessments for the residential scenario are presented in Tables G-4.2-48, G-4.2-49, and G-4.2-50. The total excess cancer risk is approximately 6×10^{-6}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately

0.2, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.7 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

Calcium does not have a published toxicity value, but is among those elements identified in section 5.9.4 of RAGS (EPA 1989, 008021) as an essential macronutrient. As an essential nutrient, calcium may be compared to the RDA for adults and children. The RDA is 1200 mg of calcium per day (mg/day) for an adult and 800 mg/d for a child (National Research Council 1989, 064000, pp. 179-181). If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected between 0–10 ft at SWMU 01-003(e) of 6100 mg/kg, at the EPA default adult soil ingestion rate of 100 mg of soil per day, an adult would ingest approximately 0.9 mg calcium per day. At the intake level of 0.9 mg calcium per day, the adult's ingestion of calcium is less than the RDA for calcium of 1200 mg/day. If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected between 0-10 ft at SWMU 01-003(e) of 6100 mg/kg, at the EPA default child soil ingestion rate of 200 mg of soil per day, a child would ingest approximately 2.0 mg calcium per day. At the intake level of 2.0 mg calcium per day, the child's ingestion of calcium is less than the RDA for calcium of 800 mg/day. Therefore, no adverse health effects are expected from calcium at 6100 mg/kg, and calcium is eliminated as a COPC.

SWMU 01-003(e) is located along the northern wall of Los Alamos Canyon. The area is unsuitable for a building and the SWMU is not near a building. Therefore, potential risk from vapor intrusion was not evaluated at SWMU 01-003(e).

G-4.2-9 SWMU 01-006(d)

The results of the risk screening assessments for the industrial scenario are presented in Table G-4.2-51. The HI is approximately 0.0004, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide or carcinogenic COPCs for this site.

The results of the risk screening assessments for the recreational scenario are presented in Table G-4.2-52. The HI is approximately 0.0005, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide or carcinogenic COPCs for this site.

The results of the risk screening assessments for the construction worker scenario are presented in Table G-4.2-53. The HI is approximately 0.0001, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide or carcinogenic COPCs for this site.

The results of the risk screening assessments for the residential scenario are presented in Table G-4.2-54. The HI is approximately 0.005, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide or carcinogenic COPCs for this site.

No VOCs were detected at SWMU 01-006(d). Therefore, potential risk from vapor intrusion was not evaluated.

G-4.2-10 AOC 01-006(g)

The results of the risk screening assessments for the recreational scenario are presented in Tables G-4.2-55 G-4.2-56, and G-4.2-57. The total excess cancer risk is approximately 2×10^{-6}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.002, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.08 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The results of the risk screening assessments for the residential scenario are presented in Tables G-4.2-58, G-4.2-59, and G-4.2-60. The total excess cancer risk is approximately 1×10^{-5}, which is equivalent to the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.03, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.5 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The results of the residential vapor intrusion screening assessments are presented in Tables G-4.2-61 and G-4.2-62. The total excess cancer risk is approximately 7×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.0006, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

G-4.2-11 SWMU 01-006(o)

The results of the risk screening assessments for the residential scenario are presented in Tables G-4.2-63, G-4.2-64, and G-4.2-65. The total excess cancer risk is approximately 2×10^{-6}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.3, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 1.2 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

No VOCs were detected at SWMU 01-006(o). Therefore, potential risk from vapor intrusion was not evaluated.

G-4.2-12 SWMU 01-007(d)

The results of the risk screening assessments for the residential scenario are presented in Tables G-4.2-66 and G-4.2-67. The total excess cancer risk is approximately 3×10^{-7}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.09, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide COPCs for this site.

The results of the residential vapor intrusion screening assessments are presented in Tables G-4.2-68 and G-4.2-69. The total excess cancer risk is approximately 2×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.002, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

G-4.2-13 SWMU 01-007(e)

The results of the risk screening assessments for the residential scenario are presented in Tables G-4.2-70 and G-4.2-71. The total excess cancer risk is approximately 2×10^{-5}, which is slightly above the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). Benzo(a)pyrene accounts for 62% of the risk, and the EPC is a maximum detected concentration. The HI is approximately 0.3, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide COPCs for this site.

Calcium does not have a published toxicity value, but is among those elements identified in section 5.9.4 of RAGS (EPA 1989, 008021) as an essential macronutrient. As an essential nutrient, calcium may be compared to the RDA for adults and children. The RDA is 1200 mg of calcium per day (mg/day) for an adult and 800 mg/d for a child (National Research Council 1989, 064000, pp. 179-181). If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected between 0–10 ft at SWMU 01-007(e) of 2580 mg/kg, at the EPA default adult soil ingestion rate of 100 mg of soil

per day, an adult would ingest approximately 0.37 mg calcium per day. At the intake level of 0.37 mg calcium per day, the adult's ingestion of calcium is less than the RDA for calcium of 1200 mg/day. If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected between 0–10 ft at SWMU 01-007(e) of 2580 mg/kg, at the EPA default child soil ingestion rate of 200 mg of soil per day, a child would ingest approximately 0.86 mg calcium per day. At the intake level of 0.86 mg calcium per day, the child's ingestion of calcium is less than the RDA for calcium of 800 mg/day. Therefore, no adverse health effects are expected from calcium at 2580 mg/kg, and calcium is eliminated as a COPC.

The results of the residential vapor intrusion screening assessments are presented in Table G-4.2-72. The HI is approximately 0.000003, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). There are no carcinogenic VOCs detected.

G-4.2-14 SWMU 01-007(j)

The results of the risk screening assessments for the residential scenario are presented in Tables G-4.2-73 and G-4.2-74. The total excess cancer risk is approximately 3×10^{-6}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.6, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide COPCs for this site.

No VOCs were detected at SWMU 01-007(j). Therefore, potential risk from vapor intrusion was not evaluated.

G-4.2-15 AOC 01-007(k)

The results of the risk screening assessments for the residential scenario are presented in Tables G-4.2-75, G-4.2-76, and G-4.2-77. The total excess cancer risk is approximately 7×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.2, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.2 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The results of the residential vapor intrusion screening assessments are presented in Tables G-4.2-78 and G-4.2-79. The total excess cancer risk is approximately 7×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.00006, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

G-4.2-16 SWMU 03-009(j)

The results of the risk screening assessments for the industrial scenario are presented in Tables G-4.2-80 and G-4.2-81. The total excess cancer risk is approximately 1×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.1, which is less than the NMED target of HI 1.0 (NMED 2006, 092513). There were no radionuclide COPCs for this site.

The results of the risk screening assessments for the recreational scenario are presented in Table G-4.2-82. The HI is approximately 0.1, which is less than the NMED target of 1.0 (NMED 2006, 092513). There were no radionuclide COPCs for this site.

The results of the risk screening assessments for the residential scenario are presented in Tables G-4.2-83 and G-4.2-84. The total excess cancer risk is approximately 7×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.2, which

is less than the NMED target of HI 1.0 (NMED 2006, 092513). There were no radionuclide COPCs for this site.

Calcium does not have a published toxicity value, but is among those elements identified in section 5.9.4 of RAGS (EPA 1989, 008021) as an essential macronutrient. As an essential nutrient, calcium may be compared to the RDA for adults and children. The RDA is 1200 mg of calcium per day (mg/day) for an adult and 800 mg/d for a child (National Research Council 1989, 064000, pp. 179-181). If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected between 0–10 ft at SWMU 03-009(j) of 3590 mg/kg, at the EPA default adult soil ingestion rate of 100 mg of soil per day, an adult would ingest approximately 0.51 mg calcium per day. At the intake level of 0.51 mg calcium per day, the adult's ingestion of calcium is less than the RDA for calcium of 1200 mg/day. If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected between 0–10 ft at SWMU 03-009(j) of 3590 mg/kg, at the EPA default child soil ingestion rate of 200 mg of soil per day, a child would ingest approximately 1.2 mg calcium per day. At the intake level of 1.2 mg calcium per day, the child's ingestion of calcium is less than the RDA for calcium of 800 mg/day. Therefore, no adverse health effects are expected from calcium at 3590 mg/kg, and calcium is eliminated as a COPC.

No VOCs were detected at SWMU 03-009(j). Therefore, potential risk from vapor intrusion was not evaluated.

G-4.2-17 SWMU 32-001

The dioxin and furan congener TEF calculations are presented in Tables G-4.2-85. The results of the risk screening assessments for the industrial scenario are presented in Tables G-4.2-86 and G-4.2-87. The total excess cancer risk is approximately 2×10^{-7}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.005, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide COPCs detected from the 0–1 ft depth at this site.

The dioxin and furan congener TEF calculations are presented in Tables G-4.2-88. The results of the risk screening assessments for the construction worker scenario are presented in Tables G-4.2-89, G-4.2-90, and G-4.2-91. The total excess cancer risk is approximately 5×10^{-6}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.1, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.03 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The dioxin and furan congener TEF calculations are presented in Tables G-4.2-88. The results of the risk screening assessments for the residential scenario are presented in Tables G-4.2-92, G-4.2-93, and G-4.2-94. The total excess cancer risk is approximately 8×10^{-7}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.04, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.7 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The results of the residential vapor intrusion screening assessments are presented in Tables G-4.2-95 and G-4.2-96. The total excess cancer risk is approximately 1×10^{-6}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.0006, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

G-4.2-18 AOC 32-004

The results of the risk screening assessments for the industrial scenario are presented in Tables G-4.2-97, G-4.2-98, and G-4.2-99. The total excess cancer risk is approximately 2×10^{-5}, which is slightly above the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). Benzo(a)pyrene accounts for 80% of the risk. The HI is approximately 0.1, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.01 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The results of the risk screening assessments for the construction worker scenario are presented in Tables G-4.2-100, G-4.2-101, and G-4.2-102. The total excess cancer risk is approximately 1×10^{-5}, which is equivalent to the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.1, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.04 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The results of the risk screening assessments for the residential scenario are presented in Tables G-4.2-103, G-4.2-104, and G-4.2-105. The total excess cancer risk is approximately 5×10^{-5}, which is above the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). Benzo(a)pyrene accounts for 79% of the risk. The HI is approximately 0.2, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).The total dose is 0.05 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The results of the residential vapor intrusion screening assessments are presented in Table G-4.2-106. The HI is approximately 0.000008, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). There are no carcinogenic VOCs detected.

G-4.2-19 SWMU 41-001

The results of the risk screening assessments for the industrial scenario are presented in Tables G-4.2-107, G-4.2-108, and G-4.2-109. The total excess cancer risk is approximately 9×10^{-7}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.09, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.05 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The results of the risk screening assessments for the recreational scenario are presented in Tables G-4.2-110, G-4.2-111, and G-4.2-112. The total excess cancer risk is approximately 5×10^{-7}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.09, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.02 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The results of the risk screening assessments for the residential scenario are presented in Tables G-4.2-113, G-4.2-114, and G-4.2-115. The total excess cancer risk is approximately 7×10^{-7}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.3, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.2 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

Calcium does not have a published toxicity value, but is among those elements identified in section 5.9.4 of RAGS (EPA 1989, 008021) as an essential macronutrient. As an essential nutrient, calcium may be compared to the RDA for adults and children. The RDA is 1200 mg of calcium per day (mg/day) for an adult and 800 mg/d for a child (National Research Council 1989, 064000, pp. 179-181). If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected between

0-10 ft at SWMU 41-001 of 3370 mg/kg, at the EPA default adult soil ingestion rate of 100 mg of soil per day, an adult would ingest approximately 0.48 mg calcium per day. At the intake level of 0.48 mg calcium per day, the adult's ingestion of calcium is less than the RDA for calcium of 1200 mg/day. If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected between 0-10 ft between 0-10 ft at SWMU 41-001 of 3370 mg/kg, at the EPA default child soil ingestion rate of 200 mg of soil per day, a child would ingest approximately 1.1 mg calcium per day. At the intake level of 1.1 mg calcium per day, the child's ingestion of calcium is less than the RDA for calcium of 800 mg/day. Therefore, no adverse health effects are expected from calcium at 3370 mg/kg, and calcium is eliminated as a COPC.

No VOCs were detected in the samples closest to the buildings. Only acetone and toluene were detected around the septic tank and outfall/drainage area. Potential risk from vapor intrusion was not evaluated at SWMU 41-001.

G-4.2-20 AOC 43-001(b2)

The dioxin and furan congener TEF calculations are presented in Tables G-4.2-116. The results of the risk screening assessments for the recreational scenario are presented in Tables G-4.2-117, G-4.2-118, and G-4.2-119. The total excess cancer risk is approximately 1×10^{-5}, which is equivalent to the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI is approximately 0.1, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.01 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The dioxin and furan congener TEF calculations are presented in Tables G-4.2-120. The results of the risk screening assessments for the residential scenario are presented in Tables G-4.2-121, G-4.2-122, and G-4.2-123. The total excess cancer risk is approximately 4×10^{-5}, which is above the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). Benzo(a)pyrene and dibenz(a,h)anthracene account for 70% of the risk, while arsenic accounts for 13% of the risk. The HI is approximately 0.1, which is less than the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.2 mrem/yr, which is less than the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

AOC 43-001(b2) is a storm drain outfall that discharges to the south-facing slope of Los Alamos Canyon. The nearest building is approximately 150 ft away. Potential risk from vapor intrusion was not evaluated at AOC 43-001(b2).

G-4.3 Uncertainty Analysis

The human health risk screening assessments are subject to varying degrees and types of uncertainty. Aspects of data evaluation and COPC identification, exposure assessment, toxicity assessment, and the additive approach all contribute to uncertainties in the risk assessment process. Each or all of these uncertainties may affect the results.

G-4.3.1 Data Evaluation and COPC Identification Process

A primary uncertainty associated with the COPC identification process is the possibility that a chemical may be inappropriately identified as a COPC when it is actually not a COPC or that a chemical may not be identified as a COPC when it actually should be identified as a COPC. Inorganic chemicals are appropriately identified as COPCs because only those chemicals above background are retained for further analysis. Similarly, radionuclides are identified as COPCs if they are detected or detected above

BVs or fallout values. There are no established BVs for organic chemicals, and all detected organic chemicals are identified as COPCs and are retained for further analysis.

Other uncertainties associated with the COPC identification process may include errors in sampling, laboratory analysis, and data analysis. However, because concentrations used in the risk screening assessments include those detected less than the estimated detection or quantitation limits, data evaluation uncertainties are expected to have little effect on the risk screening results.

G-4.3.2 Exposure Assessment

The following exposure assessment uncertainties were identified for the risk assessment: (1) the applicability of the standard scenarios, (2) the assumptions underlying the exposure pathways, and (3) the depth over which SSLs based on the exposure scenario were applied and the derivation of EPCs.

A worker may be subject to exposures in a different manner than the exposure assumptions used to derive the industrial SSLs. The assumptions for the SSLs are that the potentially exposed individual is outside on-site for a full work day, for 225 d/yr and 25 yr (NMED 2006, 092513). For the sites evaluated for the industrial scenario, workers would not be on-site for that frequency and duration. Therefore, the industrial scenario overestimates the exposure and risk/dose and is protective of a worker. The SSLs for the construction worker scenario assume that the receptor is exposed on-site for 250 d/yr over 1 yr. For the sites evaluated for the construction worker scenario, workers would not be on-site for that frequency and duration. Therefore, the construction worker scenario overestimates the exposure and risk/dose and is protective of a worker. The recreational scenario assumes that the receptor is exposed for 1 h, 200 events per yr. This scenario may also not reflect actual time spent on the site and may overestimate the potential risk/dose. The residential scenario is based on exposure of 24 h/d, 350 d/yr and 30 yr and may overestimate the potential risk/dose but is protective.

A number of assumptions are made relative to exposure pathways, including input parameters, the completeness of the pathway, the contaminated media to which an individual may be exposed, and intake rates for different routes of exposure. In the absence of site-specific data, the exposure assumptions used were consistent with default values (NMED 2006, 092513; EPA 2007, 099314). When several upper-bound values (as are found in NMED 2006, 092513) are combined to estimate exposure for any one pathway, the resulting risk estimate can exceed the 99th percentile and, therefore, can exceed the range of risk that may be reasonably expected. Also, the assumption that residual concentrations of chemicals in the tuff are available and cause exposure in the same manner as if they were in soil overestimates the potential risk to receptors.

Some uncertainty is introduced in the aggregation of data for estimating the EPCs at a site. Risk from a single location or area with relatively high COPC concentrations may be underestimated by using a representative EPC, such as at the waste lines. However, the use of a UCL is intended to provide a protective, upper-bound estimate of the COPC concentration and is assumed to be representative of average exposure to a COPC across the entire site. The use of the maximum detected concentration for the EPC usually overestimates the exposure to contamination because receptors are not consistently exposed to the maximum detected concentration across the site.

There are a number of uncertainties associated with using the Johnson and Ettinger model. Among the assumptions is that a building is present on the site, soil properties are homogeneous, and the contaminant is homogeneously distributed within the zone of contamination. The model also does not account for transformation processes. Because these and other assumptions are often not true, the concentrations generated by the model are conservative and not necessarily representative of potential vapor intrusion and risks. In addition, only bulk soil and tuff data are available for the sites. Therefore, the

concentrations that might penetrate a building are overestimated using this data. The maximum detected concentrations used in the screening also overestimate the actual concentration(s) of VOCs in the soil or tuff. For example for AOC 00-031(a), the maximum detected concentration of 1,3,5-trimethylbenzene (0.23 mg/kg) is two orders of magnitude higher than the other detected concentrations. The ProUCL program calculates a 99% UCL of 0.18 mg/kg, which is biased high due to the maximum. The HQ of 0.6 for this VOC is therefore overestimated.

Several sites within the Upper Los Alamos Canyon Aggregate Area have potential risks that exceed NMED target levels. The potential risks for SWMUs 01-007(e) and AOC 43-001(b2) may be overestimated because of uncertainties associated with the EPCs for the COPCs at these sites.

SWMU 01-007(e)

The total excess cancer risk for the residential scenario is 2×10^{-5} primarily from benzo(a)pyrene (62%), benzo(b)fluoranthene (14%), and benzo(a)anthracene (11%), and to a limited extent Aroclor-1254 (6%). Each of these COPCs was detected twice in the four samples collected, and the maximum detected concentrations were used as EPCs, all from the same sample. If the two detected concentrations for these COPCs are averaged and used as the EPCs, the total excess cancer risk is reduced to approximately 1.3×10^{-5}, which is equivalent to the NMED target risk level. In addition, the sample location is beneath a parking lot. Therefore, no pathway currently exists for human exposure.

AOC 43-001(b2)

The total excess cancer risk for the residential scenario is 4×10^{-5} primarily from benzo(a)pyrene (56%), dibenz(a,h)anthracene (14%), benzo(b)fluoranthene (6%), benzo(a)anthracene (6%), and arsenic (13%). The EPC for arsenic is similar to background. Without arsenic the total excess cancer risk for the residential scenario is approximately 3×10^{-5}. The total excess cancer risk for the recreational scenario is approximately 1×10^{-5}.

G-4.3.3 Toxicity Assessment

The primary uncertainty associated with the SSLs is related to the derivation of toxicity values used in their calculation. Toxicity values (reference doses [RfDs] and slope factors [SFs]) were used to derive the SSLs used in this risk screening assessment (NMED 2006, 092513). Uncertainties were identified in five areas with respect to the toxicity values: extrapolation from animals to humans, extrapolation from one route of exposure to another route of exposure, individual variability in the human population, the derivation of RfDs and SFs, and the chemical form of the COPC.

1. **Extrapolation from Animals to Humans.** The SFs and RfDs are often determined by extrapolation from animal data to humans, which may result in uncertainties in toxicity values because differences exist in chemical absorption, metabolism, excretion, and toxic responses between animals and humans. Differences in body weight, surface area, and pharmacokinetic relationships between animals and humans are taken into account to address these uncertainties in the dose-response relationship; however, conservatism is usually incorporated in each of these steps, resulting in the overestimation of potential risk.
2. **Extrapolation from One Route of Exposure to Another Route of Exposure.** The SFs and RfDs often contain extrapolations from one exposure route to another that result in additional conservatism in the risk calculations. The extrapolation from the oral route to the inhalation and/or the dermal route is used in the derivation of some screening values (NMED 2006, 092513).

Differences between the two exposure pathways contribute to the uncertainty in the estimation of potential risk at this site.

3. **Individual Variability in the Human Population.** For noncarcinogenic effects, the degree of variability in human physical characteristics is important both in determining the risks that can be expected at low exposures and in defining the NOAEL. The NOAEL uncertainty factor approach incorporates a 10-fold factor to reflect individual variability within the human population that can contribute to uncertainty in the risk assessment; this factor of 10 is generally considered to result in a conservative estimate of risk to noncarcinogenic COPCs.
4. **Derivation of RfDs and SFs.** The RfDs and SFs for different chemicals are derived from experiments conducted by different laboratories that may have different accuracy and precision that could lead to an over- or underestimation of the risk. The uncertainty associated with the toxicity factors for noncarcinogens is measured by the uncertainty factor, the modifying factor, and the confidence level. For carcinogens, the weight of evidence classification indicates the likelihood that a contaminant is a human carcinogen. Toxicity values with high uncertainties may change as new information is evaluated.
5. **Chemical form of the COPC.** COPCs may be bound to the environment matrix and not available for absorption into the human body. However, it is assumed that the COPCs are bioavailable. This assumption can lead to an overestimation of the total risk.

G-4.3.4 Additive Approach

For noncarcinogens, the effects of exposure to multiple chemicals are generally unknown and possible interactions could be synergistic or antagonistic, resulting in either an overestimation or underestimation of the potential risk. Additionally, RfDs used in the risk calculations typically are not based on the same endpoints with respect to severity, effects, or target organs. Therefore, the potential for noncarcinogenic effects may be overestimated for individual COPCs that act by different mechanisms and on different target organs but are addressed additively.

G-4.3.5 Use of Surrogate Chemicals

The use of surrogates for COPCs that do not have EPA-approved or provisional toxicity values also contributes to uncertainty in risk assessment. Surrogates were used to provide SSLs for benzo[g,h,i]perylene, hexanone[2-], isopropyltoluene[4-], and methylnaphthalene[2-] based on structural similarity. The overall impact of surrogates on the risk screening assessments is minimal because these COPCs were generally detected at low concentrations (less than 1 mg/kg).

G-4.4 Interpretation

AOC 00-031(a)

The total excess cancer risk for the residential scenario is 2×10^{-9}, which is below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HI is 0.02, which is below the NMED target HI of 1.0 (NMED 2006, 092513).

The total excess cancer risk for the residential vapor intrusion assessment is approximately 7×10^{-7}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI for the residential vapor intrusion assessment is approximately 0.7, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results, there are no potential unacceptable risks from COPCs for the residential scenario.

SWMU 01-001(b)

The total excess cancer risk for the recreational and residential scenarios are 1×10^{-7} and 2×10^{-7}, respectively. These risks are below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HIs for are 0.03 and 0.1, respectively, which are below the NMED target HI of 1.0 (NMED 2006, 092513). The total doses are 0.02 mrem/yr and 0.6 mrem/yr, respectively, which are below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the recreational scenario is equivalent to a total risk of 3×10^{-8}, based on conversion from dose using RESRAD, Version 6.21. The total dose for the residential scenario is equivalent to a total risk of 1×10^{-6}, based on a comparison with EPA's residential preliminary remediation goals (PRGs) for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

The total excess cancer risk for the residential vapor intrusion assessment is approximately 5×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI for the residential vapor intrusion assessment is approximately 0.0007, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results, there are no potential unacceptable risks or doses from COPCs for the recreational and residential scenarios.

SWMU 01-001(c)

The total excess cancer risks for the industrial, recreational, construction worker, and residential scenarios are 1×10^{-6}, 6×10^{-7}, 2×10^{-6}, and 4×10^{-6}, respectively. These risks are below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HIs are 0.06, 0.07, 0.3, and 0.2, respectively, which are below the NMED target HI of 1.0 (NMED 2006, 092513). The total doses are 0.4 mrem/yr, 0.3 mrem/yr, 2.4 mrem/yr, and 2.6 mrem/yr, respectively, which are below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the industrial scenario is equivalent to a total risk of 4×10^{-6}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the recreational scenario is equivalent to a total risk of 5×10^{-8}, based on conversion from dose using RESRAD, Version 6.21. The total dose for the construction worker scenario is equivalent to a total risk of 4×10^{-6}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the residential scenario is equivalent to a total risk of 2×10^{-6}, based on a comparison with EPA's residential PRGs for radionuclides (available http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

The HI for the residential vapor intrusion assessment is approximately 0.0002, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results, there are no potential unacceptable risks or doses from COPCs for the industrial, recreational, construction worker, and residential scenarios.

SWMU 01-001(e)

The HI for the residential scenario is 0.00000008, which is below the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide or carcinogenic COPCs for this site.

The HI for the residential vapor intrusion assessment is approximately 0.000003, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results, there are no potential unacceptable risks from COPCs for the residential scenario.

SWMU 01-001(t)

The total excess cancer risk for the residential scenario is 4×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HI is 0.07, which is below the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.2 mrem/yr, which is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the residential scenario is equivalent to a total risk of 4×10^{-8}, based on a comparison with EPA's residential PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

The total excess cancer risk for the residential vapor intrusion assessment is approximately 2×10^{-7}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI for the residential vapor intrusion assessment is approximately 0.0003, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results, there is no potential unacceptable risk or dose from COPCs for the residential scenario.

SWMU 01-001(u)

The total excess cancer risk for the residential scenario is 2×10^{-9}, which is below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HI is 0.08, which is below the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide COPCs for this site.

The total excess cancer risk for the residential vapor intrusion assessment is approximately 1×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI for the residential vapor intrusion assessment is approximately 0.0003, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results, there is no potential unacceptable risk from COPCs for the residential scenario.

SWMU 01-002

The total excess cancer risk for the residential scenario is 3×10^{-7},which is below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HI is 0.09, which is below the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.3 mrem/yr, which is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the residential scenario is equivalent to a total risk of 1×10^{-6}, based on a comparison with EPA's residential PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

The total excess cancer risk for the residential vapor intrusion assessment is approximately 7×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI for the residential vapor intrusion assessment is approximately 0.0005, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results, there is no potential unacceptable risk or dose from COPCs for the residential scenario.

SWMU 01-003(e)

The total excess cancer risks for the industrial, recreational, and residential scenarios are 2×10^{-6}, 1×10^{-6}, and 6×10^{-6}, respectively, which are below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HIs are 0.03, 0.04, and 0.2, respectively, which are below the NMED target HI of 1.0 (NMED 2006, 092513). The total doses are 0.1 mrem/yr, 0.04 mrem/yr, and 0.7 mrem/yr, respectively, which are below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the industrial scenario is equivalent to a total risk of 5×10^{-6}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the recreational scenario is equivalent to a total risk of 6×10^{-8}, based on conversion from dose using RESRAD, Version 6.21. The total dose for the residential scenario is equivalent to a total risk of 6×10^{-7}, based on a comparison with EPA's residential PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

Based on the risk screening assessment results, there are no potential unacceptable risks or doses from COPCs for the industrial, recreational, construction worker, and residential scenarios.

SWMU 01-006(d)

The HIs for the industrial, recreational, construction worker, and residential scenarios are 0.0004, 0.0005, 0.0001, and 0.005, respectively, which are below the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide or carcinogenic COPCs for this site.

Based on the risk screening assessment results, there are no potential unacceptable risks from COPCs for the industrial, recreational, construction worker, and residential scenarios.

AOC 01-006(g)

The total excess cancer risks for the recreational and residential scenarios are 2×10^{-6} and 1×10^{-5}, respectively, which are below or equivalent to the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HIs are 0.002 and 0.03, which are below the NMED target HI of 1.0 (NMED 2006, 092513). The total doses are 0.08 mrem/yr and 0.5 mrem/yr, respectively, which are below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the recreational scenario is equivalent to a total risk of 3×10^{-8}, based on conversion from dose using RESRAD, Version 6.21. The total dose for the residential scenario is equivalent to a total risk of 4×10^{-7}, based on a comparison with EPA's residential PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

The total excess cancer risk for the residential vapor intrusion assessment is approximately 7×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI for the residential vapor intrusion assessment is approximately 0.0006, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results, there are no potential unacceptable risks or doses from COPCs for the recreational and residential scenario.

AOC 01-006(o)

The total excess cancer risk for the residential scenario is 2×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HI is 0.3, which is below the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 1.2 mrem/yr, which is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the residential scenario is equivalent to a total risk of 2×10^{-6}, based on a comparison with EPA's residential PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

Based on the risk screening assessment results, there is no potential unacceptable risk or dose from COPCs for the residential scenario.

SWMU 01-007(d)

The total excess cancer risk for the residential scenario is 3×10^{-7}, which is below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HI is 0.09, which is below the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide COPCs for this site.

The total excess cancer risk for the residential vapor intrusion assessment is approximately 2×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI for the residential vapor intrusion assessment is approximately 0.002, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results, there is no potential unacceptable risk from COPCs for the residential scenario.

SWMU 01-007(e)

The total excess cancer risk for the residential scenario is 2×10^{-5}, which is slightly above the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). However, based on the results in the uncertainty analysis (section G-4.3.2), the potential residential risk is overestimated by the maximum detected concentration. The risk is reduced to 1.3×10^{-5} when the average of the two detected concentrations is used in the risk screening assessment. In addition, no pathway to receptors currently exists at the location where the maximum concentration was detected. The HI is 0.3, which is below the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide COPCs for this site.

The HI for the residential vapor intrusion assessment is approximately 0.000003, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results and the uncertainty analysis, there is no potential unacceptable risk from COPCs for the residential scenario.

SWMU 01-007(j)

The total excess cancer risk for the residential scenario is 3×10^{-6}, which is below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HI is 0.6, which is below the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide COPCs for this site.

Based on the risk screening assessment results, there is no potential unacceptable risk from COPCs for the residential scenario.

SWMU 01-007(k)

The total excess cancer risk for the residential scenario is 7×10^{-8}, which is below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HI is 0.2, which is below the NMED target HI of 1.0 (NMED 2006, 092513). The total dose is 0.2 mrem/yr, which is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the residential scenario is equivalent to a total risk of 9×10^{-7}, based on a comparison with EPA's residential PRGs for radionuclides (available http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

The total excess cancer risk for the residential vapor intrusion assessment is approximately 7×10^{-8}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI for the residential vapor intrusion assessment is approximately 0.00006, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results, there is no potential unacceptable risk or dose from COPCs for the residential scenario.

SWMU 03-009(j)

The total excess cancer risks for the industrial, and residential scenarios are 1×10^{-8} and 7×10^{-8}, respectively, which are below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HIs for the industrial, recreational, and residential scenarios are 0.1, 0.1, and 0.2, which are below the NMED target HI of 1.0 (NMED 2006, 092513). There were no radionuclide COPCs for this site.

Based on the risk screening assessment results, there are no potential unacceptable risks from COPCs for the industrial, recreational, and residential scenarios.

SWMU 32-001

The total excess cancer risks for the industrial, construction worker, and residential scenarios are 2×10^{-7}, 5×10^{-6}, and 8×10^{-7}, respectively, which are below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HIs are 0.005, 0.1, and 0.04, which are below the NMED target HI of 1.0 (NMED 2006, 092513). No radionuclide COPCs were detected from 0–1 ft; therefore, no radiological screening for the industrial worker was conducted. The total doses for the construction worker and the residential scenarios are 0.03 mrem/yr and 0.7 mrem/yr, respectively, which are below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the construction worker scenario is equivalent to a total risk of 6×10^{-8}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the residential scenario is equivalent to a total risk of 1×10^{-6}, based on a comparison with EPA's residential PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

The total excess cancer risk for the residential vapor intrusion assessment is approximately 1×10^{-6}, which is less than the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). The HI for the residential vapor intrusion assessment is approximately 0.0006, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results, there are no potential unacceptable risks or doses from COPCs for the industrial, construction worker, and residential scenarios.

AOC 32-004

The total excess cancer risks for the industrial, construction worker, and residential scenarios are 2×10^{-5}, 1×10^{-5}, and 5×10^{-5}, respectively. The risk for the construction worker scenario is below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513), while the risks for the industrial and residential scenarios are above the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HIs are 0.1, 0.1, and 0.2, respectively, which are below the NMED target HI of 1.0 (NMED 2006, 092513). The total doses are 0.01 mrem/yr, 0.04 mrem/yr, and 0.05 mrem/yr, respectively, which are below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the industrial scenario is equivalent to a total risk of 2×10^{-8}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the construction worker scenario is equivalent to a total risk of 1×10^{-5}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the residential scenario is equivalent to a total risk of 5×10^{-8}, based on a comparison with EPA's residential PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

The HI for the residential vapor intrusion assessment is approximately 0.000008, which is less than the NMED target HI of 1.0 (NMED 2006, 092513).

Based on the risk screening assessment results, there are no potential unacceptable doses from COPCs for the industrial, construction worker, and residential scenarios. Based on the risk screening assessment results, there are no potential unacceptable risks from COPCs for the construction worker scenario. However, there are potential unacceptable cancer risks from COPCs for the industrial and residential scenarios. Based on the risk screening assessment results, there are no potential unacceptable hazards from COPCs for the industrial, construction worker, and residential scenarios.

SWMU 41-001

The total excess cancer risks for the industrial, recreational, and residential scenarios are 9×10^{-7}, 5×10^{-7}, and 7×10^{-7}, respectively, which are below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513). The HIs are 0.09, 0.09, and 0.3, respectively, which are below the NMED target HI of 1.0 (NMED 2006, 092513). The total doses are 0.05 mrem/yr, 0.02 mrem/yr, and 0.2 mrem/yr, which are below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the industrial scenario is equivalent to a total risk of 2×10^{-6}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the recreational scenario is equivalent to a total risk of 2×10^{-8}, based on conversion from dose using RESRAD, Version 6.21. The total dose for the residential scenario is equivalent to a total risk of 1×10^{-6}, based on a comparison with EPA's residential PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

Based on the risk screening assessment results, there are no potential unacceptable risks or doses from COPCs for the industrial, construction worker, and residential scenarios.

AOC 43-001(b2)

The total excess cancer risks for the recreational and residential scenarios are 1×10^{-5} and 4×10^{-5}, respectively. The risk for the recreational scenario is equivalent to the NMED target risk level of 1×10^{-5} (NMED 2006, 092513), while the risk for the residential scenario is above the NMED target risk level of

1×10^{-5} (NMED 2006, 092513). However, based on the results in the uncertainty analysis (section G-4.3.2), the potential residential risk is overestimated. The residential cancer risk is due to polycyclic aromatic hydrocarbons, which are likely from storm water runoff from roof drains. The HIs are 0.1 for both scenarios and are below the NMED target HI of 1.0 (NMED 2006, 092513). The total doses are 0.01 mrem/yr and 0.2 mrem/yr, respectively, which are below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the recreational scenario is equivalent to a total risk of 2×10^{-8}, based on conversion from dose using RESRAD, Version 6.21. The total dose for the residential scenario is equivalent to a total risk of 1×10^{-6}, based on a comparison with EPA's residential PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

Based on the risk screening assessment results, there are no potential unacceptable risks or doses from COPCs for the recreational scenario. There are also no potential unacceptable hazards or doses for the residential scenario. However, there is a potential unacceptable cancer risk from COPCs for the residential scenario.

G-5.0 ECOLOGICAL RISK SCREENING ASSESSMENT

G-5.1 Introduction

The approach for conducting ecological assessments is described in the "Screening Level Ecological Risk Assessment Methods, Revision 2" (LANL 2004, 087630). The assessment consists of the following four parts: a scoping evaluation, a screening evaluation, an uncertainty analysis, and an interpretation of the results.

G-5.2 Scoping Evaluation

The scoping evaluation establishes the breadth and focus of the screening assessment. The ecological scoping checklists are useful tools for organizing existing ecological information (Attachment G-3). The information in the scoping checklists is used to determine whether ecological receptors might be affected, identify the types of receptors that might be present, and develop the ecological conceptual site model for each site. Some sites are in undeveloped areas, some are in residential areas, some are in industrial areas, and some are in developed areas with pavement overlying the site. For the sites that are undeveloped or developed as residential areas, the area typically provides some potential habitat for ecological receptors. However, because of the presence of residences and other townsite facilities, the quality of the habitat varies.

The scoping portion of the assessment indicated that terrestrial receptors were appropriate for evaluating the concentrations of contaminants in soil and tuff samples. Aquatic receptors were not evaluated, because no aquatic communities and no aquatic habitat or perennial source of water exists at any of the sites within the aggregate area. The depth of the regional aquifer (greater than 1000 ft bgs) and the semiarid climate limit transport to groundwater. The potential exposure pathways for terrestrial receptors in soil and tuff are root uptake, inhalation, soil ingestion, dermal contact, external irradiation, and food-web transport (Figure G-3.1-1). The weathering of tuff is the only viable natural process that may result in the exposure of receptors to contaminants in tuff. Because of the slow rate of weathering expected for tuff, exposure in tuff is negligible, although it is included in the assessment. Plant exposure in tuff is largely limited to fractures near the surface, which does not produce sufficient biomass to support an herbivore population. Consequently, the contaminants in tuff are unavailable to receptors. Much of the area on the mesas in the Upper Los Alamos Canyon Aggregate Area is developed with office buildings,

residents, parking lots, and roads. At these sites there are currently no complete pathways to ecological receptors.

The potential risk was evaluated in the risk screening assessments for the following ecological receptors representing several trophic levels:

- plants,
- soil dwelling invertebrates (represented by the earthworm),
- the deer mouse (mammalian omnivore),
- the Montane shrew (mammalian insectivore),
- the desert cottontail (mammalian herbivore),
- the red fox (mammalian carnivore),
- American robin (avian insectivore, avian omnivore, and avian herbivore), and
- American kestrel [avian invertebrate and flesh eater, a surrogate for a threatened and endangered (T&E) species].

The rationale for these receptors is presented in "Screening Level Ecological Risk Assessment Methods, Revision 2" (LANL 2004, 087630). The ecological screening levels (ESLs) were derived for each of these receptors where information was available. The ESLs were based on similar species and derived from experimentally determined NOAELs, lowest-observed-adverse-effect levels (LOAELs), or doses lethal to 50% of the population (LD_{50}). All relevant information necessary to calculate ESLs, including concentration equations, dose equations, bioconcentration factors, transfer factors, and toxicity reference values are presented in the ECORISK Database, Version 2.3 (LANL 2008, 103352).

G-5.3 Assessment Endpoints

An assessment endpoint is an "explicit expression of the actual environmental value that is to be protected, operationally defined by an ecological entity and its attributes" (EPA 1998, 062809). Assessments should include ecologically relevant endpoints that help to sustain the natural structure, function, and biodiversity of an ecosystem or its components. In a screening assessment, the assessment endpoints are attributes of ecological receptors that may be adversely affected by exposure to hazardous wastes from past operations (EPA 1997, 059370), wherein receptors are populations and communities (EPA 1999, 070086).

The ecological risk screening assessment is designed to protect populations and communities of biota rather than individual organisms, except for listed or candidate T&E species or treaty-protected species (EPA 1999, 070086). The protection of individual organisms within these designated protected species could also be achieved at the population level; the populations of these species tend to be small, and the loss of an individual adversely affects the species.

In accordance with this guidance, the Laboratory developed generic assessment endpoints to ensure that values at all levels of the food chain are considered in the ecological screening process (LANL 1999, 064137). These general assessment endpoints can be measured using impacts on reproduction, growth, and survival to represent categories of effects that may adversely impact populations. In addition, specific receptor species were chosen to represent each function group. The receptor species were chosen because of their presence at the site, their sensitivity to the chemicals of potential ecological concern (COPECs), and their potential for exposure to those COPECs. These categories of effects and the

chosen receptor species were sued to select the types of effects seen in toxicity studies considered in the development of the toxicity reference values (TRVs). Toxicity studies used in the development of TRVs included only those in which the adverse effect evaluated affected reproduction, survival, and/or growth.

The selection of receptors and assessment endpoints are designed to be protective of both the representative species used as screening receptors and the other species within their feeding guilds and the overall food web for the terrestrial and aquatic ecosystems. Focusing the assessment endpoints on the general characteristics of species that affect populations (rather than the biochemical and behavioral changes that may affect only the studied species) also ensures applicability to the ecosystem of concern.

G-5.4 Screening Evaluation

The ecological risk screening assessments identify COPECs and are based on the comparison of EPCs (UCLs or maximum detected concentrations) to ESLs in accordance with Laboratory guidance (LANL 2004, 087630). The EPCs used in the ecological risk screening assessments are presented in Tables G-2.2-1, G-2.2-4, G-2.2-7, G-2.2-9, G-2.2-10, G-2.2-12, G-2.2-13, G-2.2-16, G-2.2-17, G-2.2-19, G-2.2-20, G-2.2-21, G-2.2-23, G-2.2-25, G-2.2-26, G-2.2-27, G-2.2-29, G-2.2-31, G-2.2-34, and G-2.2-37,. The calculations of the EPCs are summarized in section G-3.3. Input and output data files for ProUCL calculations are provided on a DVD as Attachment G-1. ESLs obtained from the ECORISK Database, Version 2.3 (LANL 2008, 103352) are presented in Table G-5.4-1. The ESLs are based on similar species and are derived from experimentally determined NOAELs, LOAELs, or doses determined lethal to 50% of the test population. Information relevant to the calculation of ESLs, including concentration equations, dose equations, bioconcentration factors, transfer factors, and TRVs are presented in the ECORISK Database, Version 2.3 (LANL 2008, 103352).

The HQ calculated for each COPEC and screening receptor is the ratio of the EPC to the ESL for each ecological receptor. The higher the contaminant levels relative to the ESLs, the higher the potential risk to receptors; conversely, the higher the ESLs relative to the contaminant levels, the lower the potential risk to receptors. The analysis begins with a comparison of the minimum ESL for each COPC to the EPC. HQs greater than 0.3 are used to identify COPECs requiring additional evaluation (LANL 2004, 087630). Individual HQs for a receptor are summed to derive an HI; an HI greater than 1.0 is an indication that further assessment may be needed to be sure that exposure to multiple COPECs at a site will not lead to potential adverse impacts to a given receptor population. COPCs without ESLs are retained as COPECs and evaluated further in the uncertainty section. The HQ and HI analysis is a conservative indication of potential adverse effects and is designed to minimize the potential of overlooking possible COPECs at the site.

Calcium, iron, nitrate, perchlorate, benzyl alcohol, butylbenzene[sec-], carbon disulfide, chloromethane, ethylbenzene, isopropyltoluene[4-], propylene[1-], styrene, trichlorofluoromethane, trimethylbenzene[1,2,4-], and xylene[1,2-] do not have ESLs for any receptors. As a result, these COPCs are retained as COPECs and discussed in the uncertainty section.

The HIs for the terrestrial receptors are discussed below for each site evaluated within the aggregate area.

G-5.4-1 AOC 00-031(a)

The results of the minimum ESL comparisons are presented in Table G-5.4-2. No COPCs were retained because all of the HQs were less than 0.3.

Carbon disulfide does not have an ESL, is retained as a COPEC, and is discussed in the uncertainty section.

G-5.4-2 SWMU 01-001(b)

The results of the minimum ESL comparisons are presented in Table G-5.4-3. Cadmium, chromium, copper, mercury, nickel, selenium, silver, and Aroclor-1254 are retained as COPECs because the HQs were greater than 0.3.

Table G-5.4-4 presents the HQs and HIs for each receptor/COPEC at SWMU 01-001(b). The HI analysis indicates that all receptors, except the red fox, kestrel (top avian carnivore), and the cottontail, have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

Nitrate, perchlorate, and isopropyltoluene[4-] do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

G-5.4-3 SWMU 01-001(c)

The results of the minimum ESL comparisons are presented in Table G-5.4-5. Antimony, barium, chromium, lead, mercury, nickel, selenium, thallium, vanadium, and di-n-butyl phthalate are retained as COPECs because the HQs were greater than 0.3.

Table G-5.4-6 presents the HQs and HIs for each receptor/COPEC at SWMU 01-001(c). The HI analysis indicates that the kestrel (omnivorous), the robin (all guilds), the shrew, the deer mouse, the earthworm, and the plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

Potential ecological risks associated with aluminum are based on soil pH. Aluminum is retained only in soil with a pH lower than 5.5, in accordance with EPA guidance (EPA 2003, 085645). Aluminum was eliminated as a COPEC and was not evaluated further because the mean soil pH at SWMU 01-001(c) is 7.1 (range of pH 6 to 9.2).

Calcium, magnesium, nitrate, perchlorate, and trimethylbenzene[1,2,4] do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

G-5.4-4 SWMU 01-001(e)

The results of the minimum ESL comparison are presented in Table G-5.4-7. No COPCs were retained because the HQ was less than 0.3.

Calcium does not have an ESL, is retained as a COPEC, and is discussed in the uncertainty section.

G-5.4-5 SWMU 01-001(t)

The results of the minimum ESL comparisons are presented in Table G-5.4-8. Barium, chromium, copper, lead, nickel, and selenium are retained as COPECs because the HQs were greater than 0.3.

Table G-5.4-9 presents the HQs and HIs for each receptor/COPEC at SWMU 01-001(t). The HI analysis indicates that the robin (all guilds), shrew, deer mouse, earthworm, and the plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

Nitrate does not have an ESL, is retained as a COPEC, and is discussed in the uncertainty section.

G-5.4-6 SWMU 01-001(u)

The results of the minimum ESL comparisons are presented in Table G-5.4-10. Barium, copper, lead, selenium, and bis(2-ethylhexyl)phthalate are retained as COPECs because the HQs were greater than 0.3.

Table G-5.4-11 presents the HQs and HIs for each receptor/COPEC at SWMU 01-001(u). The HI analysis indicates that the robin (omnivorous and insectivorous) and the plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

Calcium, isopropyltoluene[4-], and trichlorofluoromethane do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

G-5.4-7 SWMU 01-002

The results of the minimum ESL comparisons are presented in Table G-5.4-12. Antimony, chromium, cyanide, lead, mercury, nickel, selenium, Aroclor-1254, and bis(2-ethylhexyl)phthalate are retained as COPECs because the HQs were greater than 0.3.

Table G-5.4-13 presents the HQs and HIs for each receptor/COPEC at SWMU 01-002. The HI analysis indicates that all receptors, except the red fox, cottontail, and deer mouse, have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

Calcium, nitrate, styrene, and trichlorofluoromethane do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

G-5.4-8 SWMU 01-003(e)

The results of the minimum ESL comparisons are presented in Table G-5.4-14. Beryllium, lead, mercury, nickel, selenium, zinc, Aroclor-1254, Aroclor-1260, bis(2-ethylhexyl)phthalate, and di-n-butylphthalate are retained as COPECs because the HQs were greater than 0.3.

Table G-5.4-15 presents the HQs and HIs for each receptor/COPEC at SWMU 01-003(e). The HI analysis indicates that all receptors, except the cottontail, have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

Calcium, nitrate, butylbenzene[sec-], chloromethane, isopropyltoluene[4-], propylene[1-], styrene, and trimethylbenzene[1,2,4-] do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

G-5.4-9 SWMU 01-006(d)

The results of the minimum ESL comparisons are presented in Table G-5.4-16. Mercury was retained as a COPEC because the HQ was greater than 0.3.

Table G-5.4-17 presents the HQs and HIs for each receptor/COPEC at SWMU 01-006(d). The HI analysis indicates that all receptors, except the kestrel, robin, and earthworm, have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

G-5.4-10 AOC 01-006(g)

The results of the minimum ESL comparisons are presented in Table G-5.4-18. Arsenic, barium, chromium, copper, nickel, and bis(2-ethylhexyl)phthalate are retained as COPECs because the HQs were greater than 0.3.

Table G-5.4-19 presents the HQs and HIs for each receptor/COPEC at AOC 01-006(g). The HI analysis indicates that the kestrel (top carnivore), the robin (omnivorous and insectivorous), earthworm, and the plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section

Nitrate, perchlorate, and trimethylbenzene[1,2,4-] do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

G-5.4-11 SWMU 01-006(o)

The results of the minimum ESL comparisons are presented in Table G-5.4-20. Aroclor-1254 and bis(2-ethylhexyl)phthalate are retained as COPECs because the HQs were greater than 0.3.

Table G-5.4-21 presents the HQs and HIs for each receptor/COPEC at SWMU 01-006(o). The HI analysis indicates that the red fox, kestrel (both guilds), and robin (omnivorous and insectivorous) have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

Nitrate and benzyl alcohol do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

G-5.4-12 SWMU 01-007(d)

The results of the minimum ESL comparisons are presented in Table G-5.4-22. Chromium, lead, nickel, selenium, and di-n-octylphthalate are retained as COPECs because the HQs were greater than 0.3.

Table G-5.4-23 presents the HQs and HIs for each receptor/COPEC at SWMU 01-007(d). The HI analysis indicates that the robin (omnivorous and insectivorous), shrew, deer mouse, earthworm, and plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

Nitrate and trimethylbenzene[1,2,4-] do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

G-5.4-13 SWMU 01-007(e)

The results of the minimum ESL comparisons are presented in Table G-5.4-24. Barium, copper, nickel, selenium, silver, Aroclor-1254, benzo(a)anthracene, and chrysene are retained as COPECs because the HQs were greater than 0.3.

Table G-5.4-25 presents the HQs and HIs for each receptor/COPEC at SWMU 01-007(e). The HI analysis indicates that the red fox, kestrel (omnivorous), robin (omnivorous and insectivorous), deer mouse, shrew, and plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

Calcium, nitrate, and trichlorofluoromethane do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

G-5.4-14 SWMU 01-007(j)

The results of the minimum ESL comparisons are presented in Table G-5.4-26. Aroclor-1254, bis(2-ethylhexyl)phthalate, and di-n-butylphthalate are retained as COPECs because the HQs were greater than 0.3.

Table G-5.4-27 presents the HQs and HIs for each receptor/COPEC at SWMU 01-007(j). The HI analysis indicates that the red fox, kestrel (both guilds), robin (omnivorous and insectivorous), and shrew have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

G-5.4-15 AOC 01-007(k)

The results of the minimum ESL comparisons are presented in Table G-5.4-28. Barium, chromium, copper, nickel, and selenium are retained as COPECs because the HQs were greater than 0.3.

Table G-5.4-29 presents the HQs and HIs for each receptor/COPEC at AOC 01-007(k). The HI analysis indicates that all receptors, except the red fox, kestrel (top carnivore), and cottontail, have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

Potential ecological risks associated with aluminum are based on soil pH. Aluminum is retained only in soil with a pH lower than 5.5, in accordance with EPA guidance (EPA 2003, 085645). Aluminum was eliminated as a COPEC and was not evaluated further because the mean soil pH at AOC 01-007(k) is 8.4 (range of pH 7.8 to 8.7).

Nitrate does not have ESLs, is retained as a COPEC, and is discussed in the uncertainty section.

G-5.4-16 SWMU 03-009(j)

The results of the minimum ESL comparisons are presented in Table G-5.4-30. Chromium, cyanide, lead, and nickel are retained as COPECs because the HQs were greater than 0.3.

Table G-5.4-31 presents the HQs and HIs for each receptor/COPEC at SWMU 03-009(j). The HI analysis indicates that the robin (all guilds), earthworm, and plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

Potential ecological risks associated with aluminum are based on soil pH. Aluminum is retained only in soil with a pH lower than 5.5, in accordance with EPA guidance (EPA 2003, 085645). Aluminum was eliminated as a COPEC and was not evaluated further because the mean soil pH at SWMU 03-009(j) is 7.2 (range of pH 7.2 to 7.3).

Calcium and nitrate do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

G-5.4-17 SWMU 32-001

The dioxin and furan congener TEF calculations are presented in Table G-5.4-32. The results of the minimum ESL comparisons are presented in Table G-5.4-33. Barium, chromium, cobalt, copper, cyanide, mercury, nickel, selenium, zinc, Aroclor-1260, bis(2-ethylhexyl)phthalate, and TCDD[2,3,7,8-] equivalent are retained as COPECs because the HQs were greater than 0.3.

Table G-5.4-34 presents the HQs and HIs for each receptor/COPEC at SWMU 32-001. The HI analysis indicates that all receptors, except the cottontail, have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

Calcium, nitrate, and perchlorate do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

G-5.4-18 AOC 32-004

The results of the minimum ESL comparisons are presented in Table G-5.4-35. Chromium, copper, lead, mercury, nickel, selenium, silver, zinc, acenaphthene, benzo(a)anthracene, bis(2-ethylhexyl)phthalate, chrysene, fluoranthene, phenanthrene, and pyrene are retained as COPECs because the HQs were greater than 0.3.

Table G-5.4-36 presents the HQs and HIs for each receptor/COPEC at AOC 32-004. The HI analysis indicates that all receptors, except the red fox, have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

Nitrate does not have an ESL, is retained as a COPEC, and is discussed in the uncertainty section.

G-5.4-19 SWMU 41-001

The results of the minimum ESL comparisons are presented in Table G-5.4-37. Chromium, lead, manganese, selenium, vanadium, zinc, bis(2-ethylhexyl)phthalate, and di-n-butylphthalate are retained as COPECs because the HQs were greater than 0.3.

Table G-5.4-38 presents the HQs and HIs for each receptor/COPEC at SWMU 41-001. The HI analysis indicates that the kestrel (both guilds), robin (all guilds), and plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

Potential ecological risks associated with aluminum are based on soil pH. Aluminum is retained only in soil with a pH lower than 5.5, in accordance with EPA guidance (EPA 2003, 085645). Aluminum was eliminated as a COPEC and was not evaluated further because the mean soil pH at SWMU 41-001 is 8.3 (range of pH 7.3 to 8.8).

Calcium, iron, nitrate, perchlorate, and benzyl alcohol do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

G-5.4-20 AOC 43-001(b2)

The dioxin and furan congener TEF calculations are presented in Table G-5.4-39. The results of the minimum ESL comparisons are presented in Table G-5.4-40. Barium, cadmium, chromium, copper, cyanide, lead, nickel, selenium, zinc, acenaphthene, benzo(a)anthracene, bis(2-ethylhexyl)phthalate, chrysene, di-n-butylphthalate, fluoranthene, phenanthrene, pyrene, and TCDD[2,3,7,8-] equivalent are retained as COPECs because the HQs were greater than 0.3.

Table G-5.4-41 presents the HQs and HIs for each receptor/COPEC at AOC 43-001(b2). The HI analysis indicates that all receptors, except the cottontail, have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

Carbon disulfide, nitrate, styrene, and trimethylbenzene[1,2,4-] do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

G-5.4-21 Summary

No potential ecological risks were found for any receptor based on minimum ESL comparisons at AOC 00-031(a), SWMU 01-001(e), and SWMU 01-006(d). The remaining sites are evaluated further in the uncertainly analysis section below.

G-5.5 Uncertainty Analysis

The uncertainty analysis describes the key sources of uncertainty related to the screening evaluations. This analysis can result in either adding or removing chemicals from the list of COPECs. This section contains a qualitative uncertainty analysis of the issues relevant to evaluating the potential ecological risk at each site.

G-5.5.1 Chemical Form

The assumptions used in the ESL derivations were conservative and not necessarily representative of actual conditions. These assumptions include maximum chemical bioavailability, maximum receptor ingestion rates, minimum bodyweight, and additive effects of multiple COPECs. Most of these factors tend to result in conservative estimates of the ESLs, which may lead to an overestimation of the potential risk. The assumption of additive effects for multiple COPECs may result in an over- or underestimation of the potential risk to receptors.

The chemical form of the individual COPCs was not determined as part of this investigation. Toxicological data are typically based on the most toxic and bioavailable chemical species, which are not typically found in the environment. The inorganic, radionuclide, and organic COPECs are not generally 100% bioavailable to receptors in the natural environment due to the adsorption of chemical constituents to matrix surfaces (e.g., soils), or rapid oxidation or reduction changes that render harmful chemical forms unavailable to biotic processes. The ESLs were calculated to ensure a conservative indication of potential risk (LANL 2004, 087630) and the values are biased toward overestimating the potential risk to receptors.

G-5.5.2 Exposure Assumptions

The EPCs used in the calculation of HQs are UCLs or maximum detected concentrations in the sediment/soil/fill/tuff to depths of 5 ft bgs and are conservative estimates of exposure to each COPC. The sampling efforts focused on areas of suspected contamination, and receptors were assumed to ingest 100% of their food and spend 100% of their time at the site. These exposure assumptions for terrestrial receptors in the Upper Los Alamos Canyon Aggregate Area may overestimate potential ecological exposure and risk.

G-5.5.3 Toxicity Values

The HQs were calculated using ESLs, which are based on NOAELs as threshold effect levels; actual risk for a given COPEC/receptor combination occurs at a higher level, somewhere between the NOAEL-based threshold and the threshold based on the LOAEL. The use of NOAELs leads to an overestimation of potential risk to ecological receptors. ESLs are based on laboratory studies requiring extrapolation to wildlife receptors. Laboratory studies are typically based on “artificial” and maintained populations with genetically similar individuals and are limited to single chemical exposures in isolated and controlled

conditions using a single exposure pathway. Wild species are concomitantly exposed to a variety of chemical and environmental stressors, potentially rendering them more susceptible to chemical stress. On the other hand, wild populations are likely more genetically diverse than laboratory populations, making wild populations, as a whole, less sensitive to chemical exposure than laboratory populations. The uncertainties associated with the ESLs tend to lead to an overestimation of potential risk.

G-5.5.4 Comparison with Background Concentrations

SWMU 01-001(b)

The ecological risk screening assessments for this site are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPCs of six inorganic COPECs are similar to background concentrations for sediment and/or tuff, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table G-5.5-1). Cadmium, chromium, copper, mercury, nickel, and selenium are eliminated as COPECs because the EPCs are similar to background. Silver is retained as a COPEC.

SWMU 01-001(c)

The ecological risk screening assessments for this site are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPCs of eight inorganic COPECs are similar to background concentrations for sediment and/or tuff, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table G-5.5-2). Antimony, barium, chromium, lead, nickel, selenium, thallium, and vanadium are eliminated as COPECs because the EPCs are similar to background. Mercury is retained as a COPEC.

SWMU 01-001(t)

The ecological risk screening assessments for this site are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPCs of five inorganic COPECs are similar to background concentrations for tuff, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table G-5.5-3). Barium, chromium, lead, nickel, and selenium are eliminated as COPECs because the EPCs are similar to background. Copper is retained as a COPEC.

SWMU 01-001(u)

The ecological risk screening assessments for this site are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPCs of four inorganic COPECs are similar to background concentrations for tuff, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table G-5.5-4). Barium, copper, lead, and selenium are eliminated as COPECs because the EPCs are similar to background. No inorganic COPECs are retained for this site.

SWMU 01-002

The ecological risk screening assessments for this site are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPCs of seven inorganic COPECs are similar to background concentrations for soil and/or tuff, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table G-5.5-5). Antimony, chromium, cyanide, lead, nickel, mercury, and selenium are eliminated as COPECs because the EPCs are similar to background. No inorganic COPECs are retained for this site.

SWMU 01-003(e)

The ecological risk screening assessments for this site are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPCs of six inorganic COPECs are similar to background concentrations for sediment, soil and/or tuff, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table G-5.5-6). Beryllium, lead, mercury, nickel, selenium, and zinc are eliminated as COPECs because the EPCs are similar to background. No inorganic COPECs are retained for this site.

SWMU 01-006(d)

The ecological risk screening assessments for this site are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPC of one inorganic COPEC is similar to background concentrations for sediment and/or tuff, indicating that exposure of receptors to this inorganic chemical is similar to background (Table G-5.5-7). Mercury is eliminated as a COPEC because the EPC is similar to background. No inorganic COPECs are retained for this site.

AOC 01-006(g)

The ecological risk screening assessments for this site are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPCs of five inorganic COPECs are similar to background concentrations for sediment and tuff, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table G-5.5-8). Arsenic, barium, chromium, copper, and nickel are eliminated as COPECs because the EPCs are similar to background. No inorganic COPECs are retained for this site.

SWMU 01-007(d)

The ecological risk screening assessments for this site are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPCs of two inorganic COPECs are similar to background concentrations for tuff, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table G-5.5-9). Lead and selenium are eliminated as COPECs because the EPCs are similar to background. Chromium and nickel are retained as COPECs.

SWMU 01-007(e)

The ecological risk screening assessments for this site are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPCs of five inorganic COPECs are similar to background concentrations for tuff, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table G-5.5-10). Barium, copper, nickel, selenium, and silver are eliminated as COPECs because the EPCs are similar to background. No inorganic COPECs are retained for this site.

SWMU 01-007(k)

The ecological risk screening assessments for this site are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPCs of four inorganic COPECs are similar to background concentrations for tuff, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table G-5.5-11). Barium, chromium, nickel, and selenium are eliminated as COPECs because the EPCs are similar to background. Copper is retained as a COPEC.

SWMU 03-009(j)

The ecological risk screening assessments for this site are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPCs of four inorganic COPECs are similar to background concentrations for tuff, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table G-5.5-12). Chromium, cyanide, lead, and nickel are eliminated as COPECs because the EPCs are similar to background. No inorganic COPECs are retained for this site.

SWMU 32-001

The ecological risk screening assessments for this site are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPCs of ten inorganic COPECs are similar to background concentrations for soil and/or tuff, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table G-5.5-13). Barium, chromium, cobalt, copper, cyanide, mercury, nickel, selenium, silver, and zinc are eliminated as COPECs because the EPCs are similar to background. No inorganic COPECs are retained for this site.

AOC 32-004

The ecological risk screening assessments for this site are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPCs of six inorganic COPECs are similar to background concentrations for soil and/or tuff, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table G-5.5-14). Chromium, copper, nickel, selenium, silver, and zinc are eliminated as COPECs because the EPCs are similar to background. Lead and mercury are retained as COPECs.

SWMU 41-001

The ecological risk screening assessments for this site are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPCs of six inorganic COPECs are similar to background concentrations for sediment, Qbt 2 tuff, and/or Qbt 1g tuff indicating that exposure of receptors to these inorganic chemicals is similar to background (Table G-5.5-15). Chromium, lead, manganese, selenium, vanadium, and zinc are eliminated as COPECs because the EPCs are similar to background. No inorganic COPECs are retained for this site.

AOC 43-001(b2)

The ecological risk screening assessments for this site are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPCs of eight inorganic COPECs are similar to background concentrations for sediment and/or tuff, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table G-5.5-16). Barium, cadmium, chromium, copper, lead, nickel, selenium, and zinc are eliminated as COPECs because the EPCs are similar to background. Cyanide is retained as a COPEC.

Summary

Because inorganic COPECs similar to background concentrations were eliminated, all COPECs at AOC 01-006(e) and SWMU 03-009(j) are not retained. Additionally, one COPEC remains at SWMU 01-001(u); however, the HIs for all receptors are less than 1. No potential ecological risks to receptors remain at these sites. The remaining sites are evaluated further below.

G-5.5.5 Area Use Factors

In addition to the direct comparison of the EPC with the ESLs, area use factors (AUFs) are used to account for the amount of time that a receptor is likely to spend within the contaminated areas based on the size of the receptor's home range (HR). The AUFs for individual organisms were developed by dividing the size of the site by the HR for that receptor. Because T&E species must be assessed on an individual basis (EPA 1999, 070086), the AUF is used for the Mexican spotted owl. The kestrel (top carnivore) is used as the surrogate receptor for the Mexican spotted owl. The unadjusted HIs for the kestrel (top carnivore) are below 1.0 for all sites, except SWMU 01-002, SWMU 01-003(e), AOC 01-006(g), SWMU 01-006(o), SWMU 01-007(j), SWMU 32-001, AOCs 32-004, SWMU 41-001, and AOC 43-001(b2).

The HR for the Mexican spotted owl is 366 ha, and the site areas are presented in Table G-5.5-17. The AUFs for the Mexican spotted owl range from 0.000002 to 0.00027. Application of the AUFs for the Mexican spotted owl to the HQs for the kestrel (top carnivore) results in adjusted HIs from 0.00001 to 0.03. There is no potential adverse impacts to the Mexican spotted owl at SWMU 01-002, SWMU 01-003(e), AOC 01-006(g), SWMU 01-006(o), SWMU 01-007(j), SWMU 32-001, AOC 32-004, SWMU 41-001, and AOC 43-001(b2).

G-5.5.6 Population Area Use Factors

EPA guidance is to manage the ecological risk to populations rather than to individuals, with the exception of T&E species (EPA 1999, 070086). One approach to addressing the potential effects on populations is to estimate the spatial extent of the area inhabited by the local population that overlaps with the contaminated area. The population area for each receptor is based on the individual receptor home range and its dispersal distance (Bowman et al. 2002, 073475). Bowman et al. (2002, 073475) estimate that the median dispersal distance for mammals is 7 times the linear dimension of the HR (i.e., the square root of the HR area). If only the dispersal distances for the mammals with HRs within the range of the screening receptors are used, the median dispersal distance becomes 3.6 times the square root of the HR ($R^2 = 0.91$) (Bowman et al. 2002, 073475). If it is assumed that the receptors can disperse over the same distance in any direction, the population area is circular and the dispersal distance is the radius of the circle. Therefore, the population area for each receptor can be derived by $\pi(3.6\sqrt{HR})^2$ or approximately 40HR.

The population area use factor (PAUF) is calculated by dividing the site area by the population area of the receptor (Tables G-5.5-17 and G-5.5-18). The HIs are recalculated minus the COPECs eliminated based on similarity to background (section G-5.5-4) and the HQs are adjusted by multiplying by the PAUFs. If the PAUF is greater than 1, the HQs are not adjusted for that receptor. The HQs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs. The adjusted HQs and HIs for each site are presented in Tables G-5.5-19 to G-5.5-33.

SWMU 01-001(b)

The site area for SWMU 01-001(b) is 0.019 ha (Table G-5.5-18). The adjusted HIs are less than 1.0 for all the ecological receptors (Table G-5.5-19).

SWMU 01-001(c)

The site area for SWMU 01-001(c) is 0.014 ha (Table G-5.5-18). The adjusted HIs are less than 1.0 for all the ecological receptors, except the earthworm (Table G-5.5-20).

Dourson and Stara (1983, 073474) conducted a study of uncertainty factors incorporated in calculating ESLs for ecological receptors. Based on their study, the LOAEL to NOAEL adjustment indicates that HIs up to 10 may not adversely affect ecological receptors. To maintain conservatism, they state that HIs less than 3 do not adversely affect ecological receptors. Therefore, the HI of 7 for the earthworm does not indicate potential risk because it is less than 10.

SWMU 01-001(t)

The site area for SWMU 01-001(t) is 0.17 ha (Table G-5.5-18). The adjusted HIs are less than or equivalent to 1.0 for all the ecological receptors, except the plant (Table G-5.5-21).

Dourson and Stara (1983, 073474) conducted a study of uncertainty factors incorporated in calculating ESLs for ecological receptors. Based on their study, the LOAEL to NOAEL adjustment indicates that HIs up to 10 may not adversely affect ecological receptors. To maintain conservatism, they state that HIs less than 3 do not adversely affect ecological receptors. Therefore, the HI of 2 for the plant does not indicate potential risk because it is less than 3.

In addition, field observations made during the site visit and field activities found no indication of adverse impacts on the plant community (Attachment G-3).

SWMU 01-002

The site area for SWMU 01-002 is 0.23 ha (Table G-5.5-17). The adjusted HIs are less than 1.0 for all the ecological receptors (Table G-5.5-22).

SWMU 01-003(e)

The site area for SWMU 01-003(e) is 0.34 ha (Table G-5.5-17). The adjusted HIs are less than 1.0 for all the ecological receptors (Table G-5.5-23).

SWMU 01-006(g)

The site area for SWMU 01-006(g) is 0.044 ha (Table G-5.5-17). The adjusted HIs are less than 1.0 for all the ecological receptors (Table G-5.5-24).

SWMU 01-006(o)

The site area for SWMU 01-006(0) is 0.08 ha (Table G-5.5-17). The adjusted HIs are less than 1.0 for all the ecological receptors (Table G-5.5-25).

SWMU 01-007(d)

The site area for SWMU 01-007(d) is 0.07 ha (Table G-5.5-18). The adjusted HIs are less than 1.0 for all the ecological receptors, except the earthworm and plant (Table G-5.5-26).

The plant and earthworm HI is high (23) almost entirely because of chromium. The EPC for chromium is the maximum concentration and overestimates the potential risk to both receptors.

In addition, field observations made during the site visit and field activities found no indication of adverse impacts on the plant community (Attachment G-3).

SWMU 01-007(e)

The site area for SWMU 01-007(e) is 0.04 ha (Table G-5.5-18). The adjusted HIs are less than 1.0 for all the ecological receptors (Table G-5.5-27).

SWMU 01-007(j)

The site area for SWMU 01-007(j) is 0.06 ha (Table G-5.5-17). The adjusted HIs are less than 1.0 for all the ecological receptors (Table G-5.5-28).

SWMU 01-007(k)

The site area for SWMU 01-007(k) is 0.47 ha (Table G-5.5-18). The adjusted HIs are less than 1.0 for all the ecological receptors, except for the earthworm and the plant (Table G-5.5-29).

Dourson and Stara (1983, 073474) conducted a study of uncertainty factors incorporated in calculating ESLs for ecological receptors. Based on their study, the LOAEL to NOAEL adjustment indicates that HIs up to 10 may not adversely affect ecological receptors. To maintain conservatism, they state that HIs less than 3 do not adversely affect ecological receptors. Therefore, because they are less than 3, the HIs of 2 for the earthworm and the plant do not indicate potential risk.

In addition, field observations made during the site visit and field activities found no indication of adverse impacts on the plant community (Attachment G-3).

SWMU 32-001

The site area for SWMU 32-001 is 0.0009 ha (Table G-5.5-17). The adjusted HIs are less than 1.0 for all the ecological receptors (Table G-5.5-30).

AOC 32-004

The site area for SWMU 32-004 is 0.004 ha (Table G-5.5-17). The adjusted HIs are less than 1.0 for all the ecological receptors, except the earthworm and plant (Table G-5.5-31). The HI (8) for the earthworm is primarily from mercury, and to a lesser extent fluoranthene, phenanthrene, and pyrene. The plant HI (2) is from lead and acenaphthene with all HQs less than 1.

Dourson and Stara (1983, 073474) conducted a study of uncertainty factors incorporated in calculating ESLs for ecological receptors. Based on their study, the LOAEL to NOAEL adjustment indicates that HIs up to 10 may not adversely affect ecological receptors. To maintain conservatism, they state that HIs less than 3 do not adversely affect ecological receptors. Therefore, the HIs for the earthworm and plant do not indicate potential risks.

In addition, field observations made during the site visit and field activities found no indication of adverse impacts on the plant community (Attachment G-3).

SWMU 41-001

The site area for SWMU 41-001 is 0.1 ha (Table G-5.5-17). The adjusted HIs are less than 1.0 for all the ecological receptors (Table G-5.5-32).

AOC 43-001(b2)

The site area for SWMU 43-001(b2) is 0.05 ha (Table G-5.5-17). The adjusted HIs are less than or equivalent to 1.0 for all the ecological receptors, except the earthworm (Table G-5.5-33). The HI (2) for the earthworm is primarily from fluoranthene, phenanthrene, and pyrene; all HQs are less than 1.0.

Dourson and Stara (1983, 073474) conducted a study of uncertainty factors incorporated in calculating ESLs for ecological receptors. Based on their study, the LOAEL to NOAEL adjustment indicates that HIs up to 10 may not adversely affect ecological receptors. To maintain conservatism, they state that HIs less than 3 do not adversely affect ecological receptors. Therefore, the HI for the earthworm does not indicate a potential risk because it is less than 3.

G-5.5.7 Exposure Pathways

Much of the area on the mesas within the Upper Los Alamos Canyon Aggregate Area is developed with office buildings, residents, parking lots, and roads. At these sites there are no complete pathways to ecological receptors. SWMU 01-002 is located under pavement and buildings of Timber Ridge Condominiums and various commercial and residential buildings. SWMUs 01-007(c) and 01-007(e) are completely under pavement and residential buildings. The area where AOC 01-007(k) is located is completely developed, and the site lies beneath the structures and parking lot of the Los Alamos Inn. AOC 01-007(j) is in an area that is highly developed and is partially beneath buildings, sidewalks, and roads.

G-5.5.8 COPECs without ESLs

Several COPECs do not have ESLs for any receptor in the current version of the ECORISK Database (LANL 2008, 103352) because relevant toxicity data for these chemicals has not been found. In an effort to address this uncertainty and provide a quantitative assessment of potential ecological risk, several online toxicity databases have been searched in order to find relevant toxicity information. The online databases searched included EPA Ecotox Database, EPA Office of Pesticide Programs Aquatic Life Benchmarks, U.S. Army Corps of Engineers/EPA Environmental Residue-Effects, California Cal/Ecotox Database, Pesticide Action Network Pesticide Database, U.S. Army Wildlife Toxicity Assessment Program, USDA Integrated Pesticide Management Database, American Bird Conservancy Pesticide Toxicity Database, and Oak Ridge National Laboratory Risk Assessment Information System. Toxicity data was obtained for several COPECs and receptors as a result of this online database search and interim ESLs were calculated. The ESLs are termed interim because they are still undergoing review, documentation has not yet been completed, and, therefore, are not yet in the ECORISK Database. Once the development process is completed the interim ESLs will be finalized and included in the appropriate revision to the ECORISK Database. Although the majority of the COPECs listed did not have any relevant toxicity data in the online databases, a search of the literature continues in an effort to determine if any relevant toxicity information exists.

In the absence of a chemical-specific ESL, COPEC concentrations can be compared to ESLs for a surrogate chemical. Comparison to surrogate ESLs provides an estimate of potential effects of a chemically related compound and a line of evidence to indicate the likelihood that ecological receptors are potentially impacted.

Some COPECs without ESLs do not have chemical-specific toxicity data or surrogate chemicals to be used in the screening assessments and cannot be assessed quantitatively for potential ecological risk. These COPECs are often infrequently detected across the site. In these cases, comparisons to

residential human health SSLs are presented. The comparison of COPEC concentrations to residential human health SSLs is a viable alternative for several reasons. Animal studies are used to infer effects on humans and is the basic premise of modern toxicology (EPA 1989, 008021). In addition, toxicity values derived for the calculation of human health SSLs are often based on potential effects that are more sensitive than the ones used to derive ESLs (e.g., cellular effects for humans versus survival or reproductive effects for terrestrial animals). The EPA also applies uncertainty factors or modifying factors to ensure that the toxicity values are protective (i.e., they are adjusted by uncertainty factors to values much lower than the study results). COPEC concentrations compared with these values are an order of magnitude or more below the SSLs, which corresponds to uncertainty factors of 10 or more. Therefore, it is assumed that the differences in toxicity would not be more than an order of magnitude for any given chemical. The relative difference between values provides a weight of evidence that the potential toxicity of the COPC is likely to be low or very low to the receptor(s).

AOC 00-031(a)

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for carbon disulfide. However, carbon disulfide has an interim ESL for at least one receptor based on toxicity information from the EPA ECOTOX Database.

The minimum interim ESL for carbon disulfide (0.82 mg/kg for the deer mouse) is used to screen the carbon disulfide EPC (0.00025 mg/kg) and results in a maximum HQ of 0.0003. Because this HQ is less than 0.3, carbon disulfide is eliminated as a COPEC.

Based on this assessment, no COPECs remain at this AOC, and there is no potential ecological risk to receptors.

SWMU 01-001(b)

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for nitrate, perchlorate, and isopropyltoluene[4-]. In addition, no toxicity data were found as a result of the online database searches. However, isopropyltoluene[4-] has surrogate ESLs for a structurally related compound (toluene) in the current version of the ECORISK Database. Nitrate does not have surrogate ESLs and is assessed qualitatively.

The minimum ESL for toluene (23 mg/kg for the shrew) is used to screen the isopropyltoluene[4-] EPC (0.003 mg/kg) and results in a maximum HQ of 0.0001. Because this HQ is less than 0.3, isopropyltoluene[4-] is eliminated as a COPEC.

Nitrate was detected in 16 samples with a maximum detected concentration of 22.7 mg/kg. Nitrate is naturally occurring and the detected concentrations likely reflect natural levels, but no background data are available. The NMED residential SSL for nitrate is 100,000 mg/kg, indicating that potential toxicity is very low. Because of the potential very low toxicity and the naturally occurring concentrations, nitrate is eliminated as a COPEC.

Perchlorate was detected in one sample with a maximum detected concentration of 0.0023 mg/kg. No background data are available for perchlorate. The NMED residential SSL for perchlorate is 54.8 mg/kg, indicating that potential toxicity is low. Because of the potential low toxicity and the infrequent detection, perchlorate is eliminated as a COPEC.

Based on these assessments, no COPECs remain at this SWMU and there is no potential ecological risk to receptors.

SWMU 01-001(c)

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for calcium, magnesium, nitrate, perchlorate, and trimethylbenzene[1,2,4-]. In addition, no toxicity data were found as a result of the online database searches. However, trimethylbenzene[1,2,4-] has surrogate ESLs for a structurally related compound (benzene) in the current version of the ECORISK Database. Calcium, magnesium, nitrate, and perchlorate do not have surrogate ESLs and are assessed qualitatively.

Calcium was detected in 8 samples with no concentrations above background. The maximum detected concentration between 0-5 ft for calcium is 1400 mg/kg and the EPC is 1119 mg/kg. All concentrations were less than Qbt 2,3,4 BV (2200 mg/kg). Because calcium is not different from background and is an essential nutrient (EPA 1989, 008021), it is eliminated as a COPEC.

Magnesium was detected in 8 samples with only one concentration above background. The maximum detected concentration between 0–5 ft for magnesium is 827 mg/kg and the EPC is 636.4 mg/kg. All concentrations were less than Qbt 2,3,4 BV (1690 mg/kg). Because magnesium is not different from background and is an essential nutrient (EPA 1989, 008021), it is eliminated as a COPEC.

Nitrate was detected in two samples with a maximum detected concentration of 0.4 mg/kg. Nitrate is naturally occurring, and the detected concentrations likely reflect natural levels, but no background data are available. The NMED residential SSL for nitrate is 100,000 mg/kg, indicating that potential toxicity is very low. Because of the potential very low toxicity and the naturally occurring concentrations, nitrate is eliminated as a COPEC.

Perchlorate was detected in one sample with a maximum detected concentration of 0.0027 mg/kg. No background data are available for perchlorate. The NMED residential SSL for perchlorate is 54.8 mg/kg, indicating that potential toxicity is low. Because of the potential low toxicity and the infrequent detection, perchlorate is eliminated as a COPEC.

The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the trimethylbenzene[1,2,4-] EPC (0.0004 mg/kg) and results in a maximum HQ of 0.00002. Because this HQ is less than 0.3, trimethylbenzene[1,2,4-] is eliminated as a COPEC.

Based on this assessment, no COPECs remain at this SWMU and there is no potential ecological risk to receptors.

SWMU 01-001(e)

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for calcium. In addition, no toxicity data were found as a result of the online database searches. Calcium does not have surrogate ESLs and is assessed qualitatively.

Calcium was detected in 4 samples with one concentration above background. The maximum detected concentration between 0–5 ft for calcium is 4940 mg/kg and the EPC is 4940 mg/kg. Concentrations were less than background or not substantially above the maximum Qbt 2,3,4 background concentration (2230 mg/kg). Because calcium is not substantially different from background and is an essential nutrient (EPA 1989, 008021), it is eliminated as a COPEC.

SWMU 01-001(t)

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for nitrate. In addition, no toxicity data were found as a result of the online database searches. Nitrate does not have surrogate ESLs and is assessed qualitatively.

Nitrate was detected in one sample with a maximum detected concentration of 3.1 mg/kg. Nitrate is naturally occurring, and the detected concentration likely reflects natural levels, but no background data are available. The NMED residential SSL for nitrate is 100,000 mg/kg, indicating that potential toxicity is very low. Because of the potential very low toxicity and the naturally occurring concentration, nitrate is eliminated as a COPEC.

SWMU 01-001(u)

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for calcium, isopropyltoluene[4-], and trichlorofluoromethane. In addition, no toxicity data were found as a result of the online database searches. However, isopropyltoluene[4-] has surrogate ESLs for a structurally related compound (toluene) in the current version of the ECORISK Database. Calcium and trichlorofluoromethane do not have surrogate ESLs and are assessed qualitatively.

Calcium was detected in 4 samples with one concentration above background. The maximum detected concentration between 0–5 ft for calcium is 2370 mg/kg and the EPC is 2370 mg/kg. All concentrations were less than or similar to the maximum Qbt 2,3,4 background concentration (2230 mg/kg). Because calcium is not substantially different from background and is an essential nutrient (EPA 1989, 008021), it is eliminated as a COPEC.

The minimum ESL for toluene (23 mg/kg for the shrew) is used to screen the isopropyltoluene[4-] EPC (0.0025 mg/kg) and results in a maximum HQ of 0.0001. Because this HQ is less than 0.3, isopropyltoluene[4-] is eliminated as a COPEC.

Trichlorofluoromethane was detected in four samples at a maximum detected concentration of 0.0031 mg/kg. The NMED residential SSL for trichlorofluoromethane is 588 mg/kg, indicating that potential toxicity is low. Because of the potential low toxicity and the infrequent detection, trichlorofluoromethane is eliminated as a COPEC.

Based on these assessments, no COPECs remain at this SWMU and there is no potential ecological risk to receptors.

SWMU 01-002

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for calcium, nitrate, styrene, and trichlorofluoromethane. However, styrene has an interim ESL for at least one receptor based on toxicity information from the Oak Ridge National Laboratory Risk Assessment Information System. Calcium, nitrate, and trichlorofluoromethane do not have surrogate ESLs and are assessed qualitatively.

The minimum interim ESL for styrene (300 mg/kg for the plant) is used to screen the styrene EPC (0.0004 mg/kg) and results in a maximum HQ of 0.000001. Because this HQ is less than 0.3, styrene is eliminated as a COPEC.

Calcium was detected in 28 samples with only 5 samples having concentrations above background. The maximum detected concentration for calcium is 49,500 mg/kg and the EPC is 9969 mg/kg. All

concentrations, except for the maximum detected concentration, were less than background or less than 2–3 times the Qbt 2,3,4 maximum background concentration. The EPC is within the range of soil background concentrations. Because calcium is generally not substantially different from background, is infrequently detected above background, and is an essential nutrient (EPA 1989, 008021), it is eliminated as a COPEC.

Nitrate was detected in 10 samples with a maximum detected concentration of 7.7 mg/kg. Nitrate is naturally occurring, and the detected concentrations likely reflect natural levels, but no background data are available. The NMED residential SSL for nitrate is 100,000 mg/kg, indicating that potential toxicity is very low. Because of the potential very low toxicity and the naturally occurring concentrations, nitrate is eliminated as a COPEC.

Trichlorofluoromethane was detected in one sample with a maximum detected concentration of 0.00055 mg/kg. The NMED residential SSL for trichlorofluoromethane is 588 mg/kg, indicating that potential toxicity is low. Because of the potential low toxicity and the infrequent detection, trichlorofluoromethane is eliminated as a COPEC.

Based on these assessments, no COPECs remain at this SWMU and there is no potential ecological risk to receptors.

SWMU 01-003(e)

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for calcium, nitrate, butylbenzene[sec-], chloromethane, isopropyltoluene[4-], propylene[1-], styrene, and trimethylbenzene[1,2,4-]. However, styrene has an interim ESL for at least one receptor based on toxicity information from the Oak Ridge National Laboratory Risk Assessment Information System. In addition, isopropyltoluene[4-], butylbenzene[sec-], and trimethylbenzene[1,3,5-] have surrogate ESLs for structurally related compound (toluene and benzene, respectively) in the current version of the ECORISK Database. Calcium, nitrate, chloromethane, and propylene[1-] and do not have surrogate ESLs and are assessed qualitatively.

The minimum interim ESL for styrene (300 mg/kg for the plant) is used to screen the styrene EPC (0.0002 mg/kg) and results in a maximum HQ of 0.000001. Because this HQ is less than 0.3, styrene is eliminated as a COPEC.

Calcium was detected in 12 samples with one concentration above background. The maximum detected concentration between 0–5 ft for calcium is 6100 mg/kg and the EPC is 3513 mg/kg. All but one concentration were less than background and the EPC is not substantially different from the maximum Qbt 2,3,4 background concentration (2230 mg/kg). Because calcium is not substantially different from background and is an essential nutrient (EPA 1989, 008021), it is eliminated as a COPEC.

Nitrate was detected in six samples with a maximum detected concentration of 23.1 mg/kg. Nitrate is naturally occurring, and the detected concentrations likely reflect natural levels, but no background data are available. The NMED residential SSL for nitrate is 100,000 mg/kg, indicating that potential toxicity is very low. Because of the potential very low toxicity and the naturally occurring concentrations, nitrate is eliminated as a COPEC.

The minimum ESL for toluene (23 mg/kg for the shrew) is used to screen the isopropyltoluene[4-] EPC (0.00016 mg/kg) and results in a maximum HQ of 0.000007. Because this HQ is less than 0.3, isopropyltoluene[4-] is eliminated as a COPEC.

The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the butylbenzene[sec-] EPC (0.0008 mg/kg) and results in a maximum HQ of 0.00003. Because this HQ is less than 0.3, butylbenzene[sec-] is eliminated as a COPEC.

The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the trimethylbenzene[1,2,4-] EPC (0.0004 mg/kg) and results in a maximum HQ of 0.00002. Because this HQ is less than 0.3, trimethylbenzene[1,2,4-] is eliminated as a COPEC.

Chloromethane was detected in one sample with a maximum detected concentration of 0.00071 mg/kg. The NMED residential SSL for chloromethane is 21.8 mg/kg, indicating that potential toxicity is low. Because of the potential low toxicity and the infrequent detection, chloromethane is eliminated as a COPEC.

Propylene[1-] was detected in one sample with a maximum detected concentration of 0.00012 mg/kg. The EPA Region 6 risk-based residential SSL for propylene[1-] is 140 mg/kg, indicating that potential toxicity is low. Because of the potential low toxicity and the infrequent detection, propylene[1-] is eliminated as a COPEC.

Based on these assessments, no COPECs remain at this SWMU and there is no potential ecological risk to receptors.

AOC 01-006(g)

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for nitrate, perchlorate, and trimethylbenzene[1,2,4-]. In addition, no toxicity data were found as a result of the online database searches. However, trimethylbenzene[1,2,4-] has surrogate ESLs for a structurally related compound (benzene) in the current version of the ECORISK Database. Nitrate and perchlorate do not have surrogate ESLs and are assessed qualitatively.

The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the trimethylbenzene[1,2,4-] EPC (0.00031 mg/kg) and results in a maximum HQ of 0.00001. Because this HQ is less than 0.3, trimethylbenzene[1,2,4-] is eliminated as a COPEC.

Nitrate was detected in seven samples with a maximum detected concentration of 30.3 mg/kg. Nitrate is naturally occurring and the detected concentrations likely reflect natural levels, but no background data are available. The NMED residential SSL for nitrate is 100,000 mg/kg, indicating that potential toxicity is very low. Because of the potential very low toxicity and the naturally occurring concentrations, nitrate is eliminated as a COPEC.

Perchlorate was detected in four samples with a maximum detected concentration of 0.0087 mg/kg. No background data are available for perchlorate. The EPA regional residential SSL for perchlorate is 55 mg/kg, indicating that potential toxicity is low. Because of the potential low toxicity and the infrequent detection, perchlorate is eliminated as a COPEC.

Based on these assessments, no COPECs remain at this AOC, and there is no potential ecological risk to receptors.

SWMU 01-006(o)

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for nitrate and benzyl alcohol. In addition, no toxicity data were found as a result of the online database searches. Benzyl alcohol and nitrate do not have surrogate ESLs and are assessed qualitatively.

Benzyl alcohol was detected in one sample with a maximum detected concentration of 0.042 mg/kg. The EPA regional residential SSL for benzyl alcohol is 31,000 mg/kg, indicating that potential toxicity is very low. Because of the potential very low toxicity and the infrequent detection, benzyl alcohol is eliminated as a COPEC.

Nitrate was detected in three samples with a maximum detected concentration of 0.28 mg/kg. Nitrate is naturally occurring, and the detected concentrations likely reflect natural levels, but no background data are available. The NMED residential SSL for nitrate is 100,000 mg/kg, indicating that potential toxicity is very low. Because of the potential very low toxicity and the naturally occurring concentrations, nitrate is eliminated as a COPEC.

Based on these assessments, no COPECs remain at this SWMU and there is no potential ecological risk to receptors.

SWMU 01-007(d)

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for trimethylbenzene[1,2,4-]. In addition, no toxicity data were found as a result of the on-line database searches. However, trimethylbenzene[1,2,4-] has surrogate ESLs for a structurally related compound (benzene) in the current version of the ECORISK Database.

The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the trimethylbenzene[1,2,4-] EPC (0.00042 mg/kg) and results in a maximum HQ of 0.00002. Because this HQ is less than 0.3, trimethylbenzene[1,2,4-] is eliminated as a COPEC.

Based on these assessments, no COPECs remain at this SWMU and there is no potential ecological risk to receptors.

SWMU 01-007(e)

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for nitrate, ethylbenzene, and trichlorofluoromethane. In addition, no toxicity data were found as a result of the online database searches. However, ethylbenzene has surrogate ESLs for a structurally related compound (benzene) in the current version of the ECORISK Database. Nitrate and trichlorofluoromethane do not have surrogate ESLs and are assessed qualitatively.

Nitrate was detected in two samples with a maximum detected concentration of 1.1 mg/kg. Nitrate is naturally occurring, and the detected concentrations likely reflect natural levels, but no background data are available. The NMED residential SSL for nitrate is 100,000 mg/kg, indicating that potential toxicity is very low. Because of the potential very low toxicity and the naturally occurring concentrations, nitrate is eliminated as a COPEC.

Ethylbenzene was detected in one sample with a maximum detected concentration of 0.0001 mg/kg. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the ethylbenzene EPC

(0.0001 mg/kg) and results in a maximum HQ of 0.000004. Because this HQ is less than 0.3, ethylbenzene is eliminated as a COPEC.

Trichlorofluoromethane was detected in one sample with a maximum detected concentration of 0.00028 mg/kg. The NMED residential SSL for trichlorofluoromethane is 588 mg/kg, indicating that potential toxicity is low. Because of the potential low toxicity and the infrequent detection, trichlorofluoromethane is eliminated as a COPEC.

Based on these assessments, no COPECs remain at this SWMU and there is no potential ecological risk to receptors.

AOC 01-007(k)

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for nitrate. In addition, no toxicity data were found as a result of the online database searches. Nitrate does not have surrogate ESLs and is assessed qualitatively.

Nitrate was detected in 16 samples with a maximum detected concentration of 3.1 mg/kg. Nitrate is naturally occurring and the detected concentrations likely reflect natural levels, but no background data are available. The NMED residential SSL for nitrate is 100,000 mg/kg, indicating that potential toxicity is very low. Because of the potential very low toxicity and the naturally occurring concentrations, nitrate is eliminated as a COPEC.

Based on these assessments, no COPECs remain at this AOC, and there is no potential ecological risk to receptors.

SWMU 03-009(j)

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for calcium and nitrate. In addition, no toxicity data were found as a result of the online database searches. Calcium and nitrate do not have surrogate ESLs and are assessed qualitatively.

Calcium was detected in four samples with three concentrations above background. The maximum detected concentration between 0-5 ft for calcium is 3590 mg/kg and the EPC is 3590 mg/kg. All concentrations were less than background or not substantially different from the maximum Qbt 2,3,4 background concentration (2230 mg/kg). Because calcium is not substantially different from background and is an essential nutrient (EPA 1989, 008021), it is eliminated as a COPEC.

Nitrate was detected in four samples with a maximum detected concentration of 0.2 mg/kg. Nitrate is naturally occurring, and the detected concentrations likely reflect natural levels, but no background data are available. The NMED residential SSL for nitrate is 100,000 mg/kg, indicating that potential toxicity is very low. Because of the potential very low toxicity and the naturally occurring concentrations, nitrate is eliminated as a COPEC.

SWMU 32-001

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for calcium. In addition, no toxicity data were found as a result of the online database searches. Calcium does not have surrogate ESLs and is assessed qualitatively.

Calcium was detected in 12 samples, with only 3 samples having concentrations above background. The maximum detected concentration for calcium is 9770 mg/kg and the EPC is 4734 mg/kg. All concentrations, except for the maximum detected concentration, were less than background or less than 2 to 3 times the Qbt 2, 3, and 4 maximum background concentration. The EPC is approximately twice the Qbt 2, 3, and 4 maximum background concentration and within the range of soil background concentrations. Because calcium is generally not substantially different from background, is infrequently detected above background, and is an essential nutrient (EPA 1989, 008021), it is eliminated as a COPEC.

Based on these assessments, no COPECs remain at this SWMU and there is no potential ecological risk to receptors.

SWMU 32-004

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for nitrate. In addition, no toxicity data were found as a result of the online database searches. Nitrate does not have a surrogate ESL and is assessed qualitatively.

Nitrate was detected in one sample with a concentration of 0.26 mg/kg. Nitrate is naturally occurring, and the detected concentrations likely reflect natural levels, but no background data are available. The NMED residential SSL for nitrate is 100,000 mg/kg, indicating that potential toxicity is very low. Because of the potential very low toxicity and the naturally occurring concentrations, nitrate is eliminated as a COPEC.

SWMU 41-001

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for calcium, iron, nitrate, perchlorate, and benzyl alcohol. In addition, no toxicity data were found as a result of the online database searches. Calcium, iron, nitrate, perchlorate, and benzyl alcohol do not have surrogate ESLs and are assessed qualitatively.

Benzyl alcohol was detected in one sample with a maximum detected concentration of 0.038 mg/kg. The EPA regional residential SSL for benzyl alcohol is 31000 mg/kg, indicating that potential toxicity is very low. Because of the potential very low toxicity and the infrequent detection, benzyl alcohol is eliminated as a COPEC.

Calcium was detected in 18 samples, with only two concentrations above background. The maximum detected concentration between 0–5 ft for calcium is 2870 mg/kg and the EPC is 1736 mg/kg. All concentrations were less than background or similar to the maximum Qbt 1g background concentration (2300 mg/kg). The EPC is less than the Qbt 1g BV. Because calcium is not substantially different from background, is infrequently detected above background, and is an essential nutrient (EPA 1989, 008021), it is eliminated as a COPEC.

Iron was detected in 18 samples, with only 3 samples having concentrations above background. The maximum detected concentration for iron is 4340 mg/kg and the EPC is 3136 mg/kg. All concentrations, except for the maximum detected concentration, were less than background or less than 2 times the Qbt 1g maximum background concentration. The EPC is also less than the Qbt 1g maximum background concentration. Because iron is not substantially different from background and is infrequently detected above background, it is eliminated as a COPEC.

Nitrate was detected in 17 samples with a maximum concentration of 13.3 mg/kg. Nitrate is naturally occurring, and the detected concentrations likely reflect natural levels, but no background data are

available. The NMED residential SSL for nitrate is 100,000 mg/kg, indicating that potential toxicity is very low. Because of the potential very low toxicity and the naturally occurring concentrations, nitrate is eliminated as a COPEC.

Perchlorate was detected in two samples with a maximum detected concentration of 0.0098 mg/kg. No background data are available for perchlorate. The NMED residential SSL for perchlorate is 54.8 mg/kg, indicating that potential toxicity is low. Because of the potential low toxicity and the infrequent detection, perchlorate is eliminated as a COPEC.

Based on these assessments, no COPECs remain at this SWMU and there is no potential ecological risk to receptors.

AOC 43-001(b2)

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for nitrate, carbon disulfide, styrene, and trimethylbenzene[1,2,4-]. However, carbon disulfide and styrene have interim ESLs for at least one receptor based on toxicity information from the EPA ECOTOX Database and the Oak Ridge National Laboratory Risk Assessment Information System, respectively, and trimethylbenzene[1,2,4-] has surrogate ESLs for a structurally related compound (benzene) in the current version of the ECORISK Database. Nitrate does not have a surrogate ESL and is assessed qualitatively.

Nitrate was detected in 16 samples with a maximum detected concentration of 1.8 mg/kg. Nitrate is naturally occurring, and the detected concentrations likely reflect natural levels, but no background data are available. The NMED residential SSL for nitrate is 100,000 mg/kg, indicating that potential toxicity is very low. Because of the potential very low toxicity and the naturally occurring concentrations, nitrate is eliminated as a COPEC.

The minimum interim ESL for carbon disulfide (0.82 mg/kg for the deer mouse) is used to screen the carbon disulfide EPC (0.0005 mg/kg) and results in a maximum HQ of 0.0006. Because this HQ is less than 0.3, carbon disulfide is eliminated as a COPEC.

The minimum interim ESL for styrene (300 mg/kg for the plant) is used to screen the styrene EPC (0.00041 mg/kg) and results in a maximum HQ of 0.000001. Because this HQ is less than 0.3, styrene is eliminated as a COPEC.

The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the trimethylbenzene[1,2,4-] EPC (0.00038 mg/kg) and results in a maximum HQ of 0.00002. Because this HQ is less than 0.3, trimethylbenzene[1,2,4-] is eliminated as a COPEC.

Based on these assessments, no COPECs remain at this AOC and there is no potential ecological risk to receptors.

G-5.5.9 DOE Tier I Bioconcentration Guide

The DOE Tier I Biota Concentration Guide (BCG) is lower for strontium-90 (22.5 pCi/g) than the ECORISK Database minimum ESL (560 pCi/g). Strontium-90 was a COPC at two sites: SWMU 01-006(o) and SWMU 32-001. Using the EPC for strontium-90 for each of these sites and the DOE Tier I BCG, the HQs are 0.02 and 0.01, respectively. These HQs are too small to impact the HIs for these sites. In addition, the DOE BCG incorporates bioaccumulation factors that are orders of magnitude higher than those in the ECORISK Database. Environmental surveillance and monitoring at the Laboratory indicate

that bioaccumulation factors are not as high as those used by DOE (Bennett et al. 1996, 056035). Therefore, the ESL comparison is more representative than the BCG comparison.

The DOE Tier I Biota Concentration Guide (BCG) is lower for cesium-137 (20.8 pCi/g) than the ECORISK Database minimum ESL (680 pCi/g). Cesium-137 was a COPC at one site: SWMU 01-003(e). Using the EPC for cesium-137 for this site and the DOE Tier I BCG, the HQ is 0.007. This HQ is too small to impact the HI for the site. In addition, the DOE BCG incorporates bioaccumulation factors that are orders of magnitude higher than those in the ECORISK Database. Environmental surveillance and monitoring at the Laboratory indicate that bioaccumulation factors are not as high as those used by DOE (Bennett et al. 1996, 056035). Therefore, the ESL comparison is more representative than the BCG comparison.

G-5.5.10 Comparison with Results of Previous Field and Laboratory Studies

Biota investigations have been conducted in canyon reaches in Los Alamos/Pueblo Canyon (LANL 2004, 087390) and Mortandad Canyon (LANL 2006, 094161; LANL 2007, 098279). Field and laboratory studies included collection and analysis of soil, sediment, and water samples; cavity-nesting bird monitoring and analysis of eggs; small mammal trapping and analysis of whole organisms; earthworm bioaccumulation tests—measures of growth and survival, and analysis of whole organisms; and seedling germination tests.

The field and laboratory results on small mammals, birds, earthworms, and plants included reaches with similar or higher COPEC concentrations as detected at sites within the Upper Los Alamos Canyon Aggregate Area. The studies found no effects from exposure to COPECs in any of the canyon reaches further supporting the conclusion that there is no potential ecological risk at these sites.

The HIs for the earthworm and plant at SWMU 01-007(d) were elevated because of chromium. The EPC for chromium is the maximum detected concentration and overestimates the potential risk to these receptors. In addition, the EPC is less than chromium concentrations detected in the canyon studies of earthworm bioaccumulation tests—measures of growth and survival and seedling germination tests mentioned above. Therefore, there is no potential ecological risk at SWMU 01-007(d) to earthworms and plants.

G-5.6 Receptor Lines of Evidence

Based on the ecological risk screening assessments, several COPECs were identified at sites within the Upper Los Alamos Canyon Aggregate Area. Receptors were evaluated using several lines of evidence: minimum ESL comparisons, HI analyses, comparison to background concentrations, potential effects to populations (individuals for threatened and endangered species), and results of field and laboratory studies conducted in the canyons.

Red Fox (Carnivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors were less than 0.3 [AOC 00-031(a), SWMU 01-001(e), and SWMU 01-006(d)]
- Screening with the ESLs eliminated the red fox because the HI was less than or equivalent to 1 [SWMU 01-001(b), SWMU 01-001(c), SWMU 01-001(t), SWMU 01-001(u), SWMU 01-002, AOC 01-006(g), SWMU 01-007(d), AOC 01-007(k), SWMU 03-009(j), SWMU 32-001, AOC 32-004, SWMU 41-001, and AOC 43-001(b2)].

- The HIs were adjusted by the PAUF, which is the ratio of the site area to the red fox population area. The adjusted HIs were less than or equivalent to 1.0 for the red fox [SWMU 01-003(e), SWMU 01-006(o), SWMU 01-007(e), and SWMU 01-007(j)].

These lines of evidence support the conclusion that no potential ecological risk to the red fox exists within the Upper Los Alamos Canyon Aggregate Area.

Kestrel (Top Carnivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors were less than 0.3 [AOC 00-031(a), SWMU 01-001(e), and SWMU 01-006(d)].
- Screening with the ESLs eliminated the kestrel (top carnivore) because the HI was less than or equivalent to 1 [SWMU 01-001(b), SWMU 01-001(c), SWMU 01-001(t), SWMU 01-001(u), SWMU 01-007(d), AOC 01-007(k), and SWMU 03-009(j)].
- Several COPECs were eliminated because their EPCs were similar to background concentrations.
- The HIs were adjusted by the PAUF, which is the ratio of the site area to the kestrel population area. The adjusted HIs were less than or equivalent to 1.0 for the kestrel [SWMU 01-002, AOC 01-003(e), AOC 01-006(g), AOC 01-006(o), SWMU 01-007(e), SWMU 01-007(j), SWMU 32-001, AOC 32-004, SWMU 41-001, and AOC 43-001(b2)].
- The kestrel (top carnivore) is a surrogate for the Mexican spotted owl. The HIs were adjusted by the AUF, which is the ratio of the site area to the individual home range. The adjusted HIs are less than 1.0 for all sites.

These lines of evidence support the conclusion that no potential ecological risk to the kestrel (top carnivore) or the Mexican spotted owl exists within the Upper Los Alamos Canyon Aggregate Area.

Kestrel (Intermediate Carnivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors were less than 0.3 [AOC 00-031(a), SWMU 01-001(e), and SWMU 01-006(d)].
- Screening with the ESLs eliminated the kestrel (intermediate carnivore) because the HI was less than or equivalent to 1 [SWMU 01-001(t), SWMU 01-001(u), AOC 01-006(g), SWMU 01-007(d), and SWMU 03-009(j)]
- Several COPECs were eliminated because their EPCs were similar to background concentrations. The HIs were less than or equivalent to 1.0 for the kestrel (intermediate carnivore) [SWMU 01-001(b), AOC 01-007(k)].
- The HIs were adjusted by the PAUF, which is the ratio of the site area to the kestrel population area. The adjusted HIs were less than or equivalent to 1.0 for the kestrel [SWMU 01-001(c), SWMU 01-002, AOC 01-003(e), SWMU 01-006(o), SWMU 01-007(e), SWMU 01-007(j), SWMU 32-001, AOC 32-004, SWMU 41-001, and AOC 43-001(b2)].

These lines of evidence support the conclusion that no potential ecological risk to the omnivorous kestrel exists within the Upper Los Alamos Canyon Aggregate Area.

Robin (All Feeding Guilds)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors were less than 0.3 [AOC 00-031(a), SWMU 01-001(e), and SWMU 01-006(d)].
- Several COPECs were eliminated because their EPCs were similar to background concentrations. The HIs were less than or equivalent to 1.0 for the robin [SWMU 01-001(u), SWMU 01-007(d), and SWMU 03-009(j)].
- The HIs were adjusted by the PAUF, which is the ratio of the site area to the robin population area. The adjusted HIs were less than or equivalent to 1.0 for the robin[SWMU 01-001(b), SWMU 01-001(c), SWMU 01-001(t), SWMU 01-002, SWMU 01-003(e), AOC 01-006(g), SWMU 01-006(o), SWMU 01-007(e), SWMU 01-007(j), AOC 01-007(k), SWMU 32-001, AOC 32-004, SWMU 41-001, and AOC 43-001(b2)].
- Field studies in Los Alamos/Pueblo Canyons (LANL 2004, 087390) and Mortandad Canyon (LANL 2006, 094161) included reaches with similar or higher COPEC concentrations and found no effects from exposure to birds.

These lines of evidence support the conclusion that no potential ecological risk to the robin exists within the Upper Los Alamos Canyon Aggregate Area.

Desert Cottontail (Herbivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors were less than 0.3 [AOC 00-031(a), SWMU 01-001(e), and SWMU 01-006(d)].
- Screening with the ESLs eliminated the cottontail because the HI was less than or equivalent to 1 [SWMU 01-001(b), SWMU 01-001(c), SWMU 01-001(t), SWMU 01-001(u), SWMU 01-002, SWMU 01-003(e), AOC 01-006(g), SWMU 01-006(o), SWMU 01-007(d), SWMU 01-007(e), SWMU 01-007(j), AOC 01-007(k), SWMU 03-009(j), SWMU 32-001, SWMU 41-001, and AOC 43-001(b2)].
- Several COPECs were eliminated because their EPCs were similar to background concentrations.
- The HIs were adjusted by the PAUF, which is the ratio of the site area to the cottontail population area. The adjusted HI was less than or equivalent to 1.0 for the desert cottontail [AOC 32-004].

These lines of evidence support the conclusion that no potential ecological risk to the desert cottontail exists within the Upper Los Alamos Canyon Aggregate Area.

Montane Shrew (Insectivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors were less than 0.3 [AOC 00-031(a), SWMU 01-001(e), and SWMU 01-006(d)].
- Screening with the ESLs eliminated the shrew because the HI was less than or equivalent to 1 [SWMU 01-001(u), AOC 01-006(g), SWMU 01-006(o), SWMU 03-009(j), and SWMU 41-001].
- Several COPECs were eliminated because their EPCs were similar to background concentrations. The HIs were less than or equivalent to 1.0 for the shrew [SWMU 01-001(b), SWMU 01-001(c), SWMU 01-002, SWMU 01-003(e), and SWMU 32-001].

- The HIs were adjusted by the PAUF, which is the ratio of the site area to the shrew population area. The adjusted HI was less than or equivalent to 1.0 for the shrew [SWMU 01-001(t), SWMU 01-007(d), SWMU 01-007(e), SWMU 01-007(j), AOC 01-007(k), AOC 32-004, and AOC 43-001(b2)].
- Field studies in Los Alamos/Pueblo Canyons (LANL 2004, 087390) and Mortandad Canyon (LANL 2006, 094161) included reaches with similar or higher COPEC concentrations and found no effects from exposure to small mammals.

These lines of evidence support the conclusion that no potential ecological risk to the montane shrew exists within the Upper Los Alamos Canyon Aggregate Area.

Deer Mouse (Omnivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors were less than 0.3 [AOC 00-031(a), SWMU 01-001(e), and SWMU 01-006(d)].
- Screening with the ESLs eliminated the deer mouse because the HI was less than or equivalent to 1 [SWMU 01-001(c), SWMU 01-001(u), SWMU 01-002, AOC 01-006(g), SWMU 01-006(o), SWMU 01-007(j), SWMU 03-009(j), SWMU 32-001, and SWMU 41-001].
- Several COPECs were eliminated because their EPCs were similar to background concentrations. The HIs were less than or equivalent to 1.0 for the deer mouse [SWMU 01-001(b) and SWMU 01-003(e)].
- The HIs were adjusted by the PAUF, which is the ratio of the site area to the deer mouse population area. The adjusted HI was less than or equivalent to 1.0 for the shrew [SWMU 01-001(t), SWMU 01-007(d), SWMU 01-007(e), AOC 01-007(k), AOC 32-004, and AOC 43-001(b2)].
- Field studies in Los Alamos/Pueblo Canyons (LANL 2004, 087390) and Mortandad Canyon (LANL 2006, 094161) included reaches with similar or higher COPEC concentrations and found no effects from exposure to small mammals.

These lines of evidence support the conclusion that no potential ecological risk to the deer mouse exists within the Upper Los Alamos Canyon Aggregate Area.

Earthworm (Invertebrate)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors were less than 0.3 [AOC 00-031(a), SWMU 01-001(e), and SWMU 01-006(d)].
- Screening with the ESLs eliminated the earthworm because the HI was less than or equivalent to 1 [SWMU 01-001(u), SWMU 01-006(o), SWMU 01-007(e), SWMU 01-007(j), SWMU 03-009(j), and SWMU 41-001].
- Several COPECs were eliminated because their EPCs were similar to background concentrations. The HIs were less than or equivalent to 1.0 for the earthworm [SWMU 01-001(b), SWMU 01-001(t), SWMU 01-002, SWMU 01-003(e), AOC 01-006(g), and SWMU 32-001].
- Based on Dourson and Stara (1983, 073474), HIs up to 10 may not adversely affect ecological receptors. To maintain conservatism, they state that HIs less than 3 do not adversely affect ecological receptors. Therefore, because the HI for the earthworm is equal to or less than 10, the

HI likely does not indicate potential risks [SWMU 01-001(c), AOC 01-007(k), AOC 32-004, and AOC 43-001(b2)].

- Laboratory studies in Los Alamos/Pueblo Canyons (LANL 2004, 087390) and Mortandad Canyon (LANL 2006, 094161) included reaches with similar or higher COPEC concentrations and found no effects from exposure to earthworms. Therefore, there is no potential ecological risk at SWMU 01-007(d) to earthworms.

These lines of evidence support the conclusion that no potential ecological risk to the earthworm exists within the Upper Los Alamos Canyon Aggregate Area.

Plant

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors were less than 0.3 [AOC 00-031(a), SWMU 01-001(e), and SWMU 01-006(d)].
- Screening with the ESLs eliminated the plant because the HI was less than or equivalent to 1 [SWMU 01-001(u), SWMU 01-006(o), SWMU 01-007(e), and SWMU 01-007(j)].
- Several COPECs were eliminated because their EPCs were similar to background concentrations. The HIs were less than or equivalent to 1.0 for the plant [SWMU 01-001(b), SWMU 01-001(c), SWMU 01-002, SWMU 01-003(e), AOC 01-006(g), SWMU 03-009(j), SWMU 32-001, and SWMU 41-001].
- Based on Dourson and Stara (1983, 073474), HIs up to 10 may not adversely affect ecological receptors. To maintain conservatism, they state that HIs less than 3 do not adversely affect ecological receptors. Therefore, because the HI for the plant is equal to or less than 10, the HI likely does not indicate potential risks [SWMU 01-001(t), AOC 01-007(k), AOC 32-004, and AOC 43-001(b2)].
- The plant communities were evaluated during site visits. No evidence of adverse impacts of contamination to the plant communities based on field observations was found during site visits; the plant community was typical of the surrounding area and appears healthy.
- Laboratory studies in Los Alamos/Pueblo Canyons (LANL 2004, 087390) and Mortandad Canyon (LANL 2006, 094161) included reaches with similar or higher COPEC concentrations and found no effects from exposure to plants. Therefore, there is no potential ecological risk at SWMU 01-007(d) to plants.

These lines of evidence support the conclusion that no potential ecological risk to the plant community exists within the Upper Los Alamos Canyon Aggregate Area.

G-5.7 COPECs with No ESLs

COPECs with no ESLs were evaluated for each site. If an interim or surrogate ESL were available, the minimum ESL was used to screen the COPEC. If an interim or surrogate ESL were not available and a residential SSL was available, the residential SSL was used to estimate potential toxicity. In addition, the frequency of detection and the concentrations detected were also evaluated. All COPECs were eliminated based on these comparisons.

The analysis of COPECs with no ESLs supports the conclusion that there is no potential ecological risk to any receptor within the Upper Los Alamos Canyon Aggregate Area.

G-5.8 Summary

No potential ecological risks were found for any receptor following evaluations based on minimum ESLs, HI analyses, comparisons to background, potential effects to populations (individuals for T&E species), and comparisons to field and laboratory study results conducted in the canyons. These lines of evidence, discussed for each receptor, and the analysis of COPECs with no ESLs support the conclusion that there is no potential ecological risk within the Upper Los Alamos Canyon Aggregate Area.

G-6.0 CONCLUSIONS

G-6.1 Human Health Risk Screening Assessments

The human health risk screening assessments indicated no potential unacceptable risks or doses from COPCs for the industrial, recreational, construction worker, and residential scenarios for 23 of the 25 sites evaluated in the Upper Los Alamos Canyon Aggregate Area. AOC 32-004 had potential unacceptable cancer risks for the industrial and residential scenarios, but not for the construction worker scenario. AOC 43-001(b2) had potential unacceptable cancer risk for the residential scenario, but not for the recreational scenario.

The total excess cancer risks were equivalent to or below the NMED target risk level of 1×10^{-5} (NMED 2006, 092513) for the recreational and construction worker scenarios at all sites where evaluated. The total excess cancer risks for the industrial scenario were below or equivalent to the NMED target risk level, except at AOC 32-004, which had a total excess cancer risk of 2×10^{-5}. The total excess cancer risks for the residential scenario were below or equivalent to the NMED target risk level, except at AOC 32-004 and AOC 43-001(b2). Total excess cancer risks are 5×10^{-5}, and 4×10^{-5}, respectively.

The HIs for the industrial, recreational, construction worker, and residential scenarios were less than the NMED target HI of 1.0 (NMED 2006, 092513) for all sites where evaluated.

The vapor intrusion of VOCs into buildings was evaluated for the residential scenario using the Johnson and Ettinger model (http://www.epa.gov/swerrims/riskassessment/airmodel/johnson_ettinger.htm) for subsurface vapor intrusion. The maximum detected concentration of each VOC COPC was compared to the risk-based concentration generated by the model for each site. The HIs and total excess cancer risks were less than the NMED target HI of 1.0 and the NMED target cancer risk level of 1×10^{-5} (NMED 2006, 092513). Except at AOC 00-031(a), the vapor intrusion pathway did not substantially contribute to the potential residential risk. At AOC 00-031(a), the HI for vapor intrusion was 0.7. The total risk at all sites did not exceed the target risk levels.

The doses for the industrial, recreational, construction worker, and residential scenarios are below the DOE target dose of 15 mrem/yr at all of the sites evaluated. The radionuclide EPCs were also used to estimate the total risk, using EPA's residential and industrial radionuclide PRGs (available at http://epa-orgs.ornl.gov/cgi-bin/radionuclides/rprg_search), or a conversion using RESRAD, Version 6.21, for the recreational scenario. The total risks from radionuclides for the industrial scenario range from 4×10^{-6} to 2×10^{-8}. The total risks from radionuclides for the construction worker scenario range from 4×10^{-6} to 2×10^{-8}. The total risks from radionuclides for the residential scenario range from 2×10^{-6} to 4×10^{-8}. The total risks from radionuclides for the recreational scenario range from 5×10^{-8} to 2×10^{-8}.

The Laboratory's as low as reasonably achievable (ALARA) program description states that quantitative ALARA evaluations are not necessary for Laboratory activities that have a potential for annual public exposure less than a 3-mrem total effective dose equivalent individual dose ("Los Alamos National Laboratory Environmental ALARA Program," PD410, p. 7, effective November 8, 2008). For

SWMUs 01-001(e), 01-006(d), 01-007(d), 01-007(e), and 01-007(j) and AOC 00-031(a), where public access is available, radiological dose was not calculated because no radionuclide COPCs were identified at these sites. The calculated radiation dose(s) for the residential scenario at the other sites with public access ranged from 0.05 mrem/yr to 2.6 mrem/yr. Therefore, radiation exposures to the public at the sites evaluated within the Upper Los Alamos Canyon Aggregate Area in this report are ALARA.

Sites at TA-03, TA-41, and TA-43 are inaccessible by the public and are not planned for release by DOE in the foreseeable future. Therefore, an ALARA evaluation for radiological exposure to the public is not currently required. Should DOE's plans for releasing these areas change, an ALARA evaluation will be conducted at that time. It should be noted that the Laboratory addresses considerations for radiation exposures to workers under the Laboratory's occupational radiological protection program in compliance with 10 Code of Federal Regulations 835. The Laboratory's radiation protection program implements ALARA and consists of the following elements: management commitment, training, design review, radiological work review, performance assessments, and documentation.

G-6.2 Ecological Screening Assessments

Potential ecological risks were evaluated for receptors based on minimum ESLs, HI analyses, comparisons to background, potential effects to populations (individuals for T&E species), the infrequency of detection, interim or surrogate ESLs, relative toxicity, and comparisons to field and laboratory study results conducted in the canyons. These lines of evidence, discussed for each receptor, support the conclusion that there is no potential ecological risk within the Upper Los Alamos Canyon Aggregate Area.

G-7.0 REFERENCES

The following list includes all documents cited in this appendix. 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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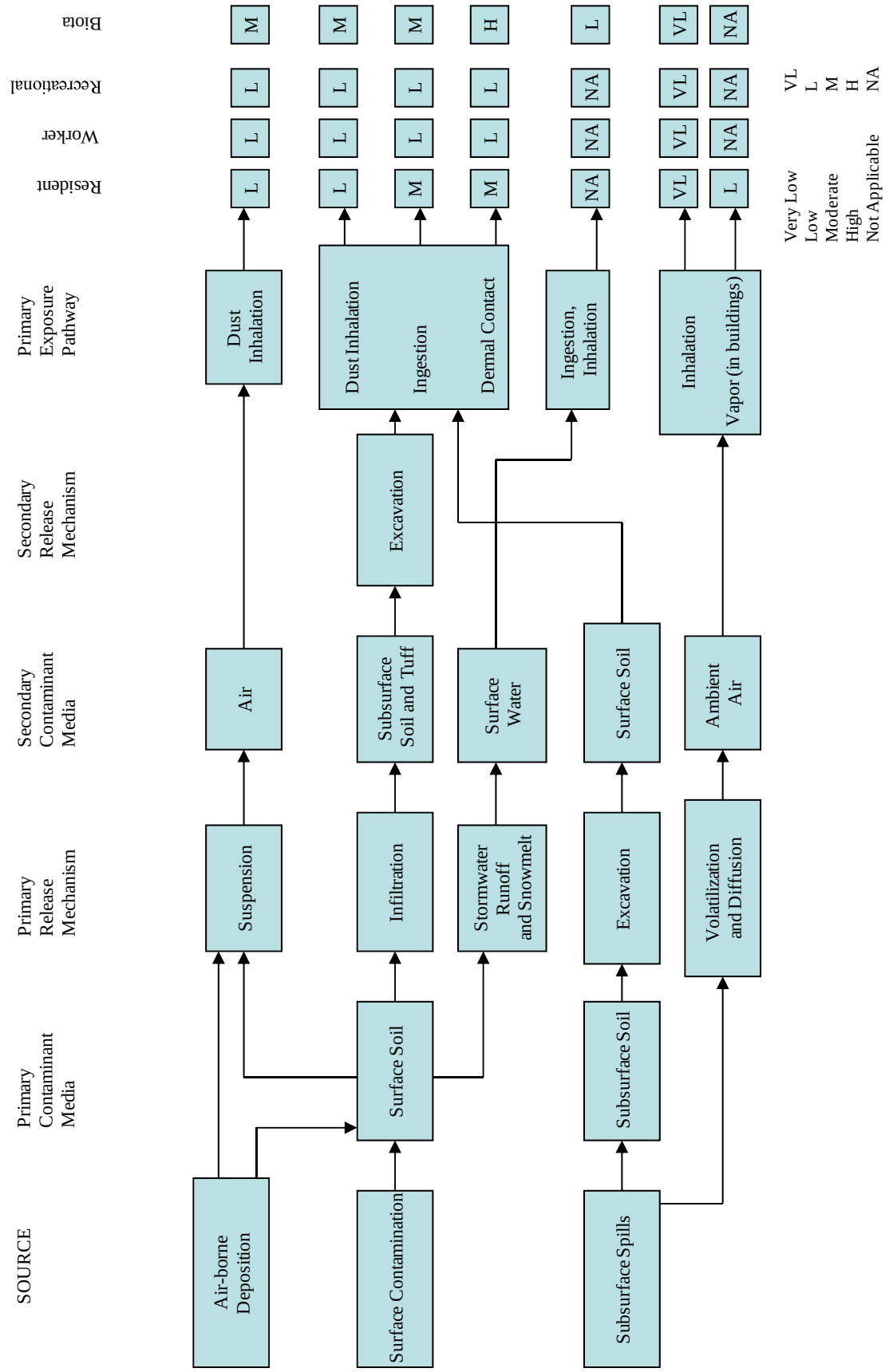


Figure G-3.1-1 Conceptual site model for Upper Los Alamos Canyon Aggregate Area

Table G-2.2-1
Exposure Point Concentrations at SWMU 00-031(a) for Ecological Receptors

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Acetone	1	1	n/a*	0.054	n/a	0.054	Maximum detected concentration
Butanone[2-]	1	1	n/a	0.0062	n/a	0.0062	Maximum detected concentration
Carbon Disulfide	1	1	n/a	0.00025	n/a	0.00025	Maximum detected concentration
Methylene Chloride	1	1	n/a	0.041	n/a	0.041	Maximum detected concentration

* n/a = Not applicable.

Table G-2.2-2
Exposure Point Concentrations at SWMU 00-031(a) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Selenium	1	0	0.53(U)	0.53(U)	n/a[a]	0.53(U)	Maximum detection limit
Organic Chemicals (mg/kg)							
Acetone	6	1	0.007(U)	0.054	n/a[a]	0.05	Maximum detected concentration
Butanone[2-]	2	1	0.0062	0.022(U)	n/a	0.006	Maximum detected concentration
Butylbenzene[sec-]	6	1	0.0052(U)	0.016	n/a	0.016	Maximum detected concentration
Carbon Disulfide	6	1	0.00025	0.0058(U)	n/a	0.0002[b]	Maximum detected concentration
Ethylbenzene	6	1	0.00085	0.0059(U)	n/a	0.0008[b]	Maximum detected concentration
Isopropylbenzene	6	1	0.0035	0.0059(U)	n/a	0.004[b]	Maximum detected concentration
Isopropyltoluene[4-]	6	1	0.0052(U)	0.042	n/a	0.04	Maximum detected concentration
Methylene Chloride	6	2	0.0052(U)	0.041	Nonparametric	0.037	95% KM (t)
Methylnaphthalene[2-]	6	1	0.29	0.39(U)	n/a	0.29[b]	Maximum detected concentration
Naphthalene	6	1	0.11	0.39(U)	n/a	0.11[b]	Maximum detected concentration
Total Petroleum Hydrocarbons – Gasoline Range Organics	6	1	0.1(U)	0.18	n/a	0.18	Maximum detected concentration
Trichlorofluoromethane	6	3	0.00058	0.012(U)	n/a	0.0007[c]	Maximum detected concentration
Trimethylbenzene[1,2,4-]	6	1	0.00056(U)	0.15	n/a	0.15	Maximum detected concentration
Trimethylbenzene[1,3,5-]	6	1	0.0052(U)	0.23	n/a	0.23	Maximum detected concentration
Xylene (total)	6	1	0.0052(U)	0.013	n/a	0.013	Maximum detected concentration

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

[c] Recommended UCL exceeds the maximum concentration; the maximum detected concentration is used.

Table G-2.2-3
Exposure Point Concentrations at SWMU 01-001(b) for the Recreational Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	7	7	0.055	0.24	Normal	1.94	95% Student's t
Chromium	7	6	1.5(U)	20.7	Gamma	17.06	95% KM (Chebyshev)
Copper	7	7	1.8	10.1	Normal	6.43	95% Student's t
Mercury	7	6	0.012	0.215	Gamma	0.175	95% KM (Chebyshev)
Nickel	7	7	1	13.9	Gamma	8.69	95% Approximate Gamma
Nitrate	7	6	0.21(U)	22.7	Normal	14.01	95% KM (t)
Selenium	7	5	0.2	0.51(U)	Normal	0.247	95% KM (t)
Silver	7	7	0.03	0.18	Gamma	0.12	95% Approximate Gamma
Organic Chemicals (mg/kg)							
Acetone	7	2	0.0027	0.038(U)	Nonparametric	0.0028[a]	Maximum detected concentration
Aroclor-1254	7	2	0.013	0.13	Nonparametric	0.12	95% KM (Chebyshev)
Methylene Chloride	7	4	0.0012	0.011	Normal	0.0066	95% KM (t)
Radionuclides (pCi/g)							
Plutonium-238	7	1	-0.01(U)	0.129	n/a[b]	0.129	Maximum detected concentration
Plutonium-239/240	7	1	0.0008(U)	0.198	n/a	0.198	Maximum detected concentration

[a] Recommended UCL exceeds the maximum concentration; the maximum detected concentration is used.

[b] n/a = Not applicable.

Table G-2.2-4
Exposure Point Concentrations at SWMU 01-001(b) for the Ecological Receptors

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	19	17	0.03(U)	8.1	Nonparametric	3.06	95% KM (Chebyshev)
Chromium	19	16	1.3(U)	67.9	Nonparametric	27.2	95% KM (Chebyshev)
Copper	19	19	1	51.3	Nonparametric	18.29	95% Chebyshev (Mead, SD)
Mercury	19	11	0.012	0.0469	Nonparametric	0.0469 [a]	Maximum detected concentration
Nickel	19	19	1	33.1	Lognormal	12.71	95% Chebyshev (MVUE))
Nitrate	19	16	0.096	22.7	Lognormal	10.27	95% KM (Chebyshev)
Perchlorate	19	1	0.0023	0.0058(U)	n/a[b]	0.0023[c]	Maximum detected concentration
Selenium	19	15	0.19	0.53(U)	Nonparametric	0.242	95% KM (BCA)
Silver	19	19	0.028	17.9	Gamma	6.77	95% Chebyshev (Mead, SD)
Organic Chemicals (mg/kg)							
Acetone	19	3	0.0027	0.038(U)	Normal	0.005	95% KM (t)
Aroclor-1254	19	4	0.0062	0.13	Approximate Gamma	0.03	95% KM (t)
4-Isopropyltoluene	19	1	0.00032	0.0058(U)	n/a	0.003[c]	Maximum detected concentration
Methylene Chloride	19	9	0.0012	0.016	Normal	0.007	95% KM (t)
Radionuclides (pCi/g)							
Cesium-134	19	1	-0.098(U)	0.054	n/a	0.054	Maximum detected concentration
Plutonium-238	19	1	-0.024(U)	0.129	n/a	0.129	Maximum detected concentration
Plutonium-239/240	19	1	0.0008	0.198	n/a	0.198	Maximum detected concentration
Uranium-235/236	19	1	-0.014(U)	0.143(U)	n/a	0.01	Maximum detected concentration

[a] Recommended UCL exceeds the maximum concentration; the maximum detected concentration is used.

[b] n/a = Not applicable.

[c] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-5
Exposure Point Concentrations at SWMU 01-001(b) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	23	20	0.03(U)	8.1	Nonparametric	3.13	95% KM (Chebyshev)
Chromium	23	20	1.3(U)	67.9	Nonparametric	24.36	95% KM (Chebyshev)
Copper	23	23	1	51.3	Nonparametric	16.98	95% Chebyshev (Mean, SD)
Mercury	23	12	0.012	0.0469	Nonparametric	0.0458	95% KM (t)
Nickel	23	23	1	33.1	Gamma	9.46	95% Approximate Gamma
Nitrate	23	19	0.096	22.7	Nonparametric	8.68	95% KM (Chebyshev)
Perchlorate	23	1	0.0023	0.0058(U)	n/a[a]	0.0023[b]	Maximum detected concentration
Selenium	23	17	0.18	0.53(U)	Nonparametric	0.253	95% KM (BCA)
Silver	23	23	0.028	17.9	Nonparametric	7.01	95% Chebyshev (Mean, SD)
Organic Chemicals (mg/kg)							
Acetone	23	4	0.0027	0.038(U)	Normal	0.0047	95% KM (t)
Aroclor-1254	23	4	0.0062	0.13	Approximate Gamma	0.026	95% KM (t)
Bis(2-ethylhexyl)phthalate	23	1	0.29	0.38(U)	n/a	0.29[b]	Maximum detected concentration
Bromomethane	23	1	0.00042(U)	0.012(U)	n/a	0.00069[b]	Maximum detected concentration
4-Isopropyltoluene	23	1	0.00032	0.0058(U)	n/a	0.00032[b]	Maximum detected concentration
Methylene Chloride	23	10	0.00082	0.016	Normal	0.00626	95% KM (t)
Radionuclides (pCi/g)							
Cesium-134	23	1	-0.098(U)	0.054	n/a	0.054	Maximum detected concentration
Plutonium-238	23	1	-0.024(U)	0.129	n/a	0.129	Maximum detected concentration
Plutonium-239/240	23	1	-0.003(U)	0.198	n/a	0.198	Maximum detected concentration
Uranium-235/236	23	1	-0.014(U)	0.143(U)	n/a	0.14[b]	Maximum detected concentration

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-6
Exposure Point Concentrations at SWMU 01-001(c) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	2	2	2510	3730	n/a[a]	3730	Maximum detected concentration
Arsenic	2	2	1.5	1.7	n/a	1.7	Maximum detected concentration
Barium	2	2	40.5	56.2	n/a	56.2	Maximum detected concentration
Beryllium	2	2	0.53	0.55	n/a	0.55	Maximum detected concentration
Calcium	2	2	1050	1180	n/a	1180	Maximum detected concentration
Chromium	2	2	3.4	4.4	n/a	4.4	Maximum detected concentration
Cobalt	2	2	1.3	1.6	n/a	1.6	Maximum detected concentration
Copper	2	2	3.2	3.8	n/a	3.8	Maximum detected concentration
Lead	2	2	9.5	11.7	n/a	11.7	Maximum detected concentration
Magnesium	2	2	761	827	n/a	827	Maximum detected concentration
Nickel	2	2	2	2.8	n/a	2.8	Maximum detected concentration
Selenium	2	2	0.2	0.25	n/a	0.25	Maximum detected concentration
Thallium	2	1	0.13	0.21(U)	n/a	0.13[b]	Maximum detected concentration
Vanadium	2	2	6.2	6.3	n/a	6.3	Maximum detected concentration
Organic Chemicals (mg/kg)							
Di-n-butylphthalate	2	1	0.049	0.35(U)	n/a	0.049[b]	Maximum detected concentration
Radionuclides (pCi/g)							
Plutonium-239/240	2	2	0.499	5.49	n/a	5.49	Maximum detected concentration

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-7
Exposure Point Concentrations at SWMU 01-001(c) for the Ecological Receptor

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	8	8	392	3730	Normal	2688	95% Student's t
Antimony	8	3	0.084(U)	0.51(UJ)	Normal	0.19	95% KM (t)
Arsenic	8	6	0.5(U)	1.7	Normal	1.44	95% KM (t)
Barium	8	8	8	56.2	Normal	41.82	95% Student's t
Beryllium	8	8	0.28	0.82	Normal	0.63	95% Student's t
Calcium	8	8	267	1400	Normal	1119	95% Student's t
Chromium	8	8	1.5	7.1	Normal	5.18	95% Student's t
Cobalt	8	8	0.36	1.6	Normal	1.296	95% Student's t
Copper	8	8	1.7	5.3	Normal	4.15	95% Student's t
Lead	8	8	3.4	11.7	Normal	10.3	95% Student's t
Magnesium	8	8	128	827	Normal	636.4	95% Student's t
Mercury	8	1	0.0153(U)	0.342	n/a [a]	0.34	Maximum detected concentration
Nickel	8	8	1.2	4.5	Normal	3.58	95% Student's t
Nitrate	8	2	0.15	0.4	n/a	0.4	Maximum detected concentration
Perchlorate	8	1	0.0027	0.0054(U)	n/a	0.0027 [b]	Maximum detected concentration
Selenium	8	6	0.2	0.52(U)	Normal	0.38	95% KM (t)
Thallium	8	2	0.13	0.21(U)	n/a	0.17 [b]	Maximum detected concentration
Vanadium	8	6	0.86 U	7.3	Normal	6.32	95% KM (t)
Organic Chemicals (mg/kg)							
Aroclor-1260	8	1	0.031	0.035(U)	n/a	0.031 [b]	Maximum detected concentration
Di-n-butylphthalate	8	1	0.049	0.35(U)	n/a	0.049 [b]	Maximum detected concentration
1,2,4-Trimethylbenzene	8	1	0.00043	0.0054(U)	n/a	0.00043 [b]	Maximum detected concentration
Radionuclides (pCi/g)							
Plutonium-239/240	8	7	0.081(U)	7.24	Gamma	5.75	95% KM (Chebyshev)

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U or UJ) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-8
Exposure Point Concentrations at SWMU 01-001(c) for the Residential and Construction Worker Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	9	9	321	3730	Normal	2484	95% Student's t
Antimony	9	3	0.073(U)	0.51(UJ)	Normal	0.19	95% KM (t)
Arsenic	9	6	0.36(U)	1.7	Normal	1.37	95% KM (t)
Barium	9	9	8	56.2	Normal	38.83	95% Student's t
Beryllium	9	9	0.28	0.82	Normal	0.60	95% Student's t
Calcium	9	9	231	1180	Normal	1044	95% Student's t
Chromium	9	9	1.5	9.6	Normal	6.17	95% Student's t
Cobalt	9	9	0.36	1.6	Normal	1.21	95% Student's t
Copper	9	9	1.7	5.3	Normal	3.93	95% Student's t
Lead	9	9	3.4	11.7	Normal	9.42	95% Student's t
Magnesium	9	9	128	827	Normal	591	95% Student's t
Mercury	9	1	0.0153(U)	0.342	n/a[a]	0.34[b]	Maximum detected concentration
Nickel	9	9	1.2	4.5	Normal	3.76	95% Student's t
Nitrate	9	2	0.15	0.4	n/a[a]	0.4	Maximum detected concentration
Perchlorate	9	1	0.0027	0.0054(U)	n/a[a]	0.0027[b]	Maximum detected concentration
Selenium	9	6	0.2	0.52(U)	Normal	0.37	95% KM (t)
Thallium	9	2	0.13	0.21(U)	n/a[a]	0.17[b]	Maximum detected concentration
Vanadium	9	6	0.86(U)	7.3	Normal	5.97	95% KM (t)
Organic Chemicals (mg/kg)							
Aroclor-1260	9	1	0.031	0.035(U)	n/a	0.031[b]	Maximum detected concentration
Di-n-butylphthalate	9	1	0.049	0.35(U)	n/a	0.049 [b]	Maximum detected concentration
1,2,4-Trimethylbenzene	9	1	0.00043	0.0054(U)	n/a	0.00043[b]	Maximum detected concentration
Radionuclides (pCi/g)							
Plutonium-239/240	9	7	0.025(U)	7.24	Gamma	5.75	95% KM (Chebyshev)

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U or UJ) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-9
Exposure Point Concentrations at SWMU 01-001(e) for the Ecological Receptor and Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Calcium	4	4	269	4940	n/a[a]	4940	Maximum detected concentration
Organic Chemicals (mg/kg)							
Toluene	4	1	0.0004	0.0058(U)	n/a	0.0004[b]	Maximum detected concentration

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-10
Exposure Point Concentrations at SWMU 01-001(t) for the Ecological Receptors

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Arsenic	8	8	0.52	2.9	Approximate Gamma	1.968	95% Approximate Gamma
Barium	8	8	5.3	58.8	Normal	37.5	95% Student's t
Chromium	6	6	2.2	21.3	Normal	17.37	95% Student's t
Copper	8	8	0.86	159	Nonparametric	107.2	95% Chebyshev (Mean, SD)
Lead	8	8	2.4	13	Normal	8.99	95% Student's t
Nickel	8	8	2.7	10.3	Normal	9.02	95% Student's t
Nitrate	8	1	0.12(U)	3.1	n/a[a]	3.1	Maximum detected concentration
Selenium	8	2	0.32	0.61(U)	n/a	0.36[b]	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acetone	8	1	0.0064	0.025(U)	n/a	0.0064[b]	Maximum detected concentration
Methylene Chloride	8	6	0.0025	0.026	Normal	0.017	95% KM (t)
Radionuclides (pCi/g)							
Uranium-235/236	8	2	0.008(U)	0.197	Nonparametric	0.17	95% KM (t)

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-11
Exposure Point Concentrations at SWMU 01-001(t) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Arsenic	17	15	0.52	2.9	Approximate Gamma	1.708	95% KM (BCA)
Barium	17	17	5.3	106	Gamma	54.53	95% Approximate Gamma
Chromium	15	15	1.3	40.1	Gamma	21.38	95% Approximate Gamma
Copper	17	17	0.86	159	Nonparametric	52.42	95% Chebyshev (Mean, SD)
Lead	17	17	2.4	50.5	Approximate Gamma	17.19	95% Approximate Gamma
Nickel	17	17	2.2	19	Gamma	10.07	Approximate Gamma
Nitrate	17	1	0.12(U)	3.1	n/a[a]	3.1	Maximum detected concentration
Selenium	17	7	0.21	0.61(U)	Normal	0.318[b]	95% KM (t)
Organic Chemicals (mg/kg)							
Acetone	15	2	0.0033	0.025(U)	n/a	0.0064 [b]	Maximum detected concentration
Benzyl Alcohol	17	1	0.36(U)	1.8	n/a	1.8	Maximum detected concentration
Methylene Chloride	17	6	0.0021(U)	0.026	Normal	0.0097	95% KM (t)
Radionuclides (pCi/g)							
Uranium-235/236	17	2	0.0008(U)	0.197	Nonparametric	0.17	95% KM (t)

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-12
Exposure Point Concentrations at SWMU 01-001(u) for the Ecological Receptors and Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Barium	4	4	11.4	105	n/a[a]	105	Maximum detected concentration
Calcium	4	4	449	2370	n/a	2370	Maximum detected concentration
Copper	4	4	1.5	8.1	n/a	8.1	Maximum detected concentration
Lead	4	4	14.8	28.2	Normal	27.28	95% Student's t
Selenium	4	2	0.19	0.61(U)	n/a	0.27[b]	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acetone	4	2	0.0039	0.024(UJ)	n/a	0.0061[b]	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	4	1	0.062	0.39(U)	n/a	0.062[b]	Maximum detected concentration
Fluoranthene	4	1	0.048	0.4(U)	n/a	0.048[b]	Maximum detected concentration
4-Isopropyltoluene	4	1	0.0025	0.006(U)	n/a	0.0025[b]	Maximum detected concentration
Methylene Chloride	4	2	0.0031	0.0055	n/a	0.0055	Maximum detected concentration
Pyrene	4	1	0.048	0.4(U)	n/a	0.048[b]	Maximum detected concentration
Toluene	4	1	0.00095	0.006(U)	n/a	0.00095	Maximum detected concentration
Trichlorofluoromethane	4	4	0.0018	0.0031	n/a	0.0031	Maximum detected concentration

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-13
Exposure Point Concentrations at SWMU 01-002 for the Ecological Receptors

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	28	3	0.063	4.3(U)	Normal	0.076	95% KM (t)
Beryllium	28	27	0.1	1.1	Gamma	0.477	95% KM (BCA)
Calcium	28	28	142	49500	Nonparametric	9969	95% Chebyshev (Mean, SD)
Chromium	28	28	1.2	59.4	Nonparametric	17.21	95% Approximate Gamma
Copper	28	27	0.56	5.3(U)	Gamma	2.064	95% KM (BCA)
Cyanide (total)	27	7	0.1	0.83	Lognormal	0.234	95% KM (t)
Lead	28	28	1.5	74.2	Lognormal	13.73	95% H-UCL
Mercury	28	12	0.008	0.53	Nonparametric	0.074	95% KM (BCA)
Nickel	28	27	1.2	27.4	Gamma	9.04	95% Approximate Gamma
Nitrate	27	9	0.16	7.7	Gamma	1.52	95% KM (t)
Selenium	28	24	0.2	0.62(U)	Normal	0.31	95% KM (t)
Organic Chemicals (mg/kg)							
Acetone	27	4	0.0033	0.025(U)	Normal	0.0049	95% KM (t)
Aroclor-1254	27	2	0.034(U)	0.21	Nonparametric	0.081	95% KM (t)
Aroclor-1260	27	4	0.0035(U)	0.042(U)	Gamma	0.011	95% KM (t)
Bis(2-ethylhexyl)phthalate	27	1	0.12	0.42(U)	n/a[a]	0.12[b]	Maximum detected concentration
Methylene Chloride	27	8	0.00082(U)	0.027(U)	Normal	0.0030	95% KM (t)
Styrene	27	1	0.0002(U)	0.0064(U)	n/a	0.00041[b]	Maximum detected concentration
Toluene	27	2	0.00038	0.0064(U)	n/a	0.00055[b]	Maximum detected concentration
Trichlorofluoromethane	27	1	0.00055	0.013(U)	n/a	0.00055[b]	Maximum detected concentration

Table G-2.2-13 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Radionuclides (pCi/g)							
Plutonium-238	27	2	-0.031(U)	0.117	Nonparametric	0.11	95% KM (Chebyshev)
Plutonium-239/240	27	5	-0.038(U)	0.459	Normal	0.17	95% KM (t)
Tritium	27	2	-0.31(U)	0.92	Nonparametric	0.73	95% KM (Chebyshev)
Uranium-235/236	27	3	-0.003(U)	0.231	Normal	0.14	95% KM (t)

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-14
Exposure Point Concentrations at SWMU 01-002 for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	37	3	0.0063	4.3(U)	Normal	0.076	95% KM (t)
Beryllium	37	35	0.1	1.3	Gamma	0.508	95% KM (BCA)
Calcium	37	37	142	49500	Nonparametric	8084	95% Chebyshev (Mean, SD)
Chromium	37	36	1.2	59.4	Gamma	20.06	95% KM (Chebyshev)
Copper	37	35	0.56	6.4	Lognormal	3.083	95% KM (Chebyshev)
Cyanide (total)	35	7	0.1	0.83	Lognormal	0.212	95% KM (t)
Lead	37	36	1.5	74.2	Approximate Gamma	13.42	95% Approximate Gamma
Mercury	37	37	0.008	0.53	Nonparametric	0.064	95% KM (t)
Nickel	37	35	1.2	27.4	Gamma	8.38	95% KM (BCA)
Nitrate	35	14	0.12(U)	44.3	Gamma	5.60	95% KM (t)
Selenium	37	28	0.19	0.62(U)	Normal	0.32	95% KM (t)
Organic Chemicals (mg/kg)							
Acetone	35	4	0.0033	0.025(U)	Normal	0.0046	95% KM (t)
Aroclor-1254	35	3	0.028	0.21	Normal	0.045	95% KM (t)
Aroclor-1260	35	6	0.0035	0.042(U)	Lognormal	0.0099	95% KM (t)
Benzene	35	1	0.0002	0.0064(U)	n/a[a]	0.0002[b]	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	35	1	0.12	0.42(U)	n/a	0.12[b]	Maximum detected concentration
Butlybenzene[n-]	35	1	0.00041	0.0064(U)	n/a	0.00041[b]	Maximum detected concentration
Butlybenzene[sec-]	35	1	0.00019	0.0064(U)	n/a	0.00019[b]	Maximum detected concentration
Chloroform	35	1	0.00012	0.0064(U)	n/a	0.00012[b]	Maximum detected concentration
Isopropyltoluene[4-]	35	1	0.00023	0.0064(U)	n/a	0.00023[b]	Maximum detected concentration
Methylene Chloride	35	9	0.00082(U)	0.027(U)	Normal	0.00278	95% KM (t)
Styrene	35	1	0.0002(U)	0.0064(U)	n/a	0.00041[b]	Maximum detected concentration

Table G-2.2-14 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Toluene	35	4	0.00038	0.0064(U)	Normal	0.00082	95% KM (t)
Trichlorofluoromethane	35	1	0.00055	0.013(U)	n/a	0.00055[b]	Maximum detected concentration
Vinyl Chloride	35	1	0.0017	0.0064(U)	n/a	0.0017	Maximum detected concentration
Xylene (total)	35	1	0.0051	0.0064(U)	n/a	0.0051	Maximum detected concentration
Radionuclides (pCi/g)							
Plutonium-238	35	2	-0.032(U)	0.117	Nonparametric	0.11	95% KM (Chebyshev)
Plutonium-239/240	35	8	-0.038(U)	0.459	Normal	0.16	95% KM (t)
Tritium	35	2	-0.33(U)	0.92	Nonparametric	0.71	95% KM (Chebyshev)
Uranium-235/236	35	3	-0.003(U)	0.231	Normal	0.14	95% KM (t)

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-15
Exposure Point Concentrations at SWMU 01-003(e) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Calcium	10	10	1290	2410	Normal	2133	95% Student's t
Beryllium	10	10	0.43	0.71	Normal	0.65	95% Student's t
Lead	10	10	13.4	29.1	Normal	22.21	95% Student's t
Mercury	10	10	0.0148	0.11	Gamma	0.056	Approximate Gamma
Nickel	10	10	3	13.6	Gamma	7.27	Approximate Gamma
Nitrate	10	6	0.21(U)	23.1	Normal	9.74	95% KM (t)
Zinc	10	10	21.9	38.3	Normal	33.26	95% Student's t
Organic Chemicals (mg/kg)							
Acenaphthene	10	1	0.075	0.36(U)	n/a[a]	0.075[b]	Maximum detected concentration
Anthracene	10	1	0.11	0.36(U)	n/a	0.11[b]	Maximum detected concentration
Aroclor-1254	10	1	0.034(UJ)	0.14	n/a	0.14	Maximum detected concentration
Aroclor-1260	10	5	0.027	0.087	Normal	0.058	95% KM (t)
Benzo(a)anthracene	10	3	0.048	0.35(U)	Normal	0.22	95% KM (t)
Benzo(a)pyrene	10	3	0.055	0.35(U)	Normal	0.22	95% KM (t)
Benzo(b)fluoranthene	10	2	0.049	0.35(UJ)	n/a	0.24[b]	Maximum detected concentration
Benzo(g,h,i)perylene	10	2	0.038	0.35(UJ)	n/a	0.13[b]	Maximum detected concentration
Benzo(k)fluoranthene	10	3	0.036	0.35(UJ)	Normal	0.22[b]	95% KM (t)
Bis(2-ethylhexyl)phthalate	10	3	0.056	0.52	Lognormal	0.52	95% KM (BCA)
2-Butanone	10	1	0.0014	0.022(U)	n/a	0.0014[b]	Maximum detected concentration
sec-Butylbenzene	10	2	0.00077	0.0055(UJ)	n/a	0.0008[b]	Maximum detected concentration
Chloromethane	10	1	0.00071	0.011(U)	n/a	0.00071[b]	Maximum detected concentration
Chrysene	10	4	0.045	0.35(UJ)	Lognormal	0.21	95% KM (t)
Dibenz(a,h)anthracene	10	1	0.047	0.36(UJ)	n/a	0.047[b]	Maximum detected concentration
Dibenzofuran	10	1	0.046	0.36(U)	n/a	0.046[b]	Maximum detected concentration

Table G-2.2-15 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Di-n-butylphthalate	10	1	0.045	0.36(U)	n/a	0.045[b]	Maximum detected concentration
Fluoranthene	10	5	0.056	0.57	Lognormal	0.23	95% KM (t)
Fluorene	10	1	0.079	0.36(U)	n/a	0.079[b]	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	10	1	0.12	0.36(UJ)	n/a	0.12[b]	Maximum detected concentration
4-Isopropyltoluene	10	2	0.00013	0.0055(UJ)	n/a	0.00016[b]	Maximum detected concentration
Methylene chloride	10	6	0.0012	0.0055(U)	Normal	0.0035[b]	95% KM (t)
Naphthalene	10	1	0.082	0.36(U)	n/a	0.082[b]	Maximum detected concentration
Phenanthrene	10	4	0.068	0.48	Nonparametric	0.20	95% KM (t)
1-Propylbenzene	10	1	0.00012	0.0055(UJ)	n/a	0.00012[b]	Maximum detected concentration
Pyrene	10	7	0.039	0.53	Gamma	0.20	95% KM (BCA)
Styrene	10	1	0.00019	0.0055(U)	n/a	0.00019[b]	Maximum detected concentration
Tetrachloroethene	10	1	0.00016	0.0055(U)	n/a	0.00016[b]	Maximum detected concentration
Toluene	10	1	0.00038	0.0055(U)	n/a	0.00038[b]	Maximum detected concentration
1,2,4-Trimethylbenzene	10	1	0.00027(U)	0.0052(UJ)	n/a	0.00039[b]	Maximum detected concentration
1,3,5-Trimethylbenzene	10	2	0.00011	0.0055(UJ)	n/a	0.00012[b]	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	10	4	-0.03(U)	0.202	Normal	0.15	95% KM (t)
Plutonium-239/240	10	7	0.0151(U)	1.04	Lognormal	0.60	95% KM (Chebvshev)
Tritium	10	1	-0.03(U)	0.64	n/a	0.64	Maximum detected concentration

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U or UJ) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-16
Exposure Point Concentrations at SWMU 01-003(e) for the Ecological Receptor and Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Beryllium	14	14	0.43	2.5	Nonparametric	1.09	95% Student's t
Calcium	14	12	328(U)	6100	Nonparametric	3513	95% KM (Chebyshev)
Lead	14	14	2.2	30.6	Normal	20.97	95% Student's t
Mercury	14	14	0.0148	0.129	Approximate Gamma	0.059	95% Approximate Gamma
Nickel	14	14	3	13.6	Gamma	7.13	95% Approximate Gamma
Nitrate	14	6	0.21(U)	23.1	Normal	7.11	95% KM (t)
Perchlorate	14	1	0.0051(U)	0.0062	n/a[a]	0.0062	Maximum detected concentration
Selenium	14	3	0.19	0.55(U)	Normal	0.44	95% KM (t)
Zinc	14	14	20.1	63.8	Gamma	37.77	95% Approximate Gamma
Organic Chemicals (mg/kg)							
Acenaphthene	14	1	0.075	0.36(U)	n/a	0.075[b]	Maximum detected concentration
Anthracene	14	1	0.11	0.36(U)	n/a	0.11[b]	Maximum detected concentration
Aroclor-1254	14	1	0.034 UJ	0.14	n/a	0.14	Maximum detected concentration
Aroclor-1260	14	6	0.027	0.087	Normal	0.052	95% KM (t)
Benzo(a)anthracene	14	3	0.048	0.36(U)	Normal	0.22	95% KM (t)
Benzo(a)pyrene	14	3	0.055	0.36(U)	Normal	0.22	95% KM (t)
Benzo(b)fluoranthene	14	2	0.049	0.36(U)	Nonparametric	0.24	95% KM (BCA)
Benzo(g,h,i)perylene	14	2	0.038	0.36(U)	n/a	0.13	Maximum detected concentration
Benzo(k)fluoranthene	14	3	0.036	0.36(U)	Normal	0.22	95% KM (t)
Bis(2-ethylhexyl)phthalate	14	3	0.056	0.052	Lognormal	0.52	95% KM (BCA)
2-Butanone	14	1	0.0014	0.022(U)	n/a	0.0014[b]	Maximum detected concentration
Sec-Butylbenzene	14	2	0.00077	0.0055(UJ)	n/a	0.0008[b]	Maximum detected concentration
Chloromethane	14	1	0.00071	0.011(U)	n/a	0.00071[b]	Maximum detected concentration
Chrysene	14	4	0.045	0.36(UJ)	Lognormal	0.20	95% KM (t)

Table G-2.2-16 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Dibenz(a,h)anthracene	14	1	0.047	0.36(UJ)	n/a	0.047[b]	Maximum detected concentration
Dibenzofuran	14	1	0.046	0.36(U)	n/a	0.046[b]	Maximum detected concentration
Di-n-butylphthalate	14	2	0.045	0.36(U)	n/a	0.046[b]	Maximum detected concentration
Fluoranthene	14	5	0.056	0.57	Lognormal	0.19	95% KM (t)
Fluorene	14	1	0.079	0.36(U)	n/a	0.079[b]	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	14	1	0.12	0.36(UJ)	n/a	0.12[b]	Maximum detected concentration
4-Isopropyltoluene	14	2	0.00013	0.0055(UJ)	n/a	0.00016[b]	Maximum detected concentration
Methylene Chloride	14	6	0.0012	0.0055	Normal	0.0034	95% KM (t)
Naphthalene	14	1	0.082	0.36(U)	n/a	0.082[b]	Maximum detected concentration
Phenanthrene	14	4	0.068	0.48	Nonparametric	0.17	95% KM (t)
1-Propylbenzene	14	1	0.00012	0.0055(U)	n/a	0.00012[b]	Maximum detected concentration
Pyrene	14	7	0.039	0.53	Gamma	0.18	95% KM (t)
Styrene	14	1	0.00019	0.0055(U)	n/a	0.00019[b]	Maximum detected concentration
Tetrachloroethene	14	1	0.00016	0.0055(U)	n/a	0.00016[b]	Maximum detected concentration
Toluene	14	1	0.00038	0.0055(U)	n/a	0.00038[b]	Maximum detected concentration
1,2,4-Trimethylbenzene	14	1	0.00025	0.0052(UJ)	n/a	0.00039[b]	Maximum detected concentration
1,3,5-Trimethylbenzene	14	2	0.00011	0.0055(UJ)	n/a	0.00012[b]	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	14	4	-0.04(U)	0.202	Normal	0.14	95% KM (t)
Plutonium-239/240	14	8	0.0072(U)	1.27	Lognormal	0.70	95% KM (Chebvshev)
Tritium	14	1	-0.06(U)	0.64	n/a	0.64	Maximum detected concentration

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U or UJ) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-17
Exposure Point Concentrations at SWMU 01-006(d) for All Scenarios and Ecological Receptors

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Mercury	2	2	0.122	0.122	n/a*	0.122	Maximum detected concentration
Organic Chemicals (mg/kg)							
Fluoranthene	1	1	n/a	0.053	n/a	0.053	Maximum detected concentration
Pyrene	1	1	n/a	0.053	n/a	0.053	Maximum detected concentration

* n/a = Not applicable.

Table G-2.2-18
Exposure Point Concentrations at SWMU 01-006(g) for the Recreational Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Arsenic	4	4	1.8	5.2	n/a[a]	5.2[b]	Maximum detected concentration
Barium	4	4	30.5	48.7	Normal	47.73	95% Student's t
Chromium	4	4	3	9.2	Normal	9.18	95% Student's t
Copper	4	4	2.8	12.5	Normal	11.72	95% Student's t
Nickel	4	4	2.3	4	n/a	4[b]	Maximum detected concentration
Nitrate	4	4	0.48	30.3	n/a	30.3[b]	Maximum detected concentration
Perchlorate	4	2	0.0026	0.0054(U)	n/a	0.0028[c]	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1260	4	4	0.0073	0.02	n/a	0.02[b]	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	4	1	0.056	0.36(U)	n/a	0.056[c]	Maximum detected concentration
Methylene Chloride	4	1	0.0052(U)	0.029	n/a	0.029	Maximum detected concentration
Trimethylbenzene[1,2,4-]	4	1	0.00031	0.0052(U)	n/a	0.00031[c]	Maximum detected concentration
Radionuclides (pCi/g)							
Plutonium-239/240	4	4	0.577	1.69	n/a	1.69[b]	Maximum detected concentration

[a] n/a = Not applicable.

[b] Recommended UCL exceeds the maximum concentration; the maximum detected concentration is used.

[c] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-19
Exposure Point Concentrations at SWMU 01-006(g) for the Ecological Receptors and Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Arsenic	9	9	0.62	5.2	Gamma	3.77	95% Approximate Gamma
Barium	9	9	10.3	76.5	Normal	46.82	95% Student's t
Chromium	9	9	3	17	Normal	14.32	95% Student's t
Copper	9	9	1.5	12.5	Gamma	7.221	95% Approximate Gamma
Nickel	9	9	2.3	11.1	Normal	8.22	95% Student's t
Nitrate	9	7	0.11	30.3	Gamma	18.96	95% KM (Chebyshev)
Perchlorate	9	4	0.0026	0.029	Normal	0.012	95% KM (t)
Organic Chemicals (mg/kg)							
Aroclor-1260	9	5	0.0051	0.035(U)	Normal	0.017	95% KM (t)
Bis(2-ethylhexyl)phthalate	9	2	0.048	0.36(U)	n/a[a]	0.056[b]	Maximum detected concentration
Methylene Chloride	9	3	0.0014(U)	0.029	Normal	0.028	95% KM (t)
Trimethylbenzene[1,2,4-]	9	2	0.00031	0.0053(U)	n/a	0.00032[b]	Maximum detected concentration
Radionuclides (pCi/g)							
Plutonium-239/240	9	5	0.038(U)	1.69	Normal	1.09	95% KM (t)

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-20
Exposure Point Concentrations at SWMU 01-006(o) for the Ecological Receptors and Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Nitrate	6	3	0.093	0.28	n/a [a]	0.28	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	6	3	0.028	0.47	Normal	0.27	95% KM (t)
Aroclor-1260	6	1	0.032	0.039(U)	n/a	0.032 [b]	Maximum detected concentration
Benzo(a)anthracene	6	1	0.051	0.39(U)	n/a	0.051 [b]	Maximum detected concentration
Benzo(a)pyrene	6	1	0.053	0.39(U)	n/a	0.053 [b]	Maximum detected concentration
Benzo(b)fluoranthene	6	1	0.062	0.39(U)	n/a	0.062 [b]	Maximum detected concentration
Benzo(k)fluoranthene	6	1	0.048	0.39(U)	n/a	0.048 [b]	Maximum detected concentration
Benzyl Alcohol	6	1	0.042	0.39(U)	n/a	0.042 [b]	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	6	1	0.24	0.39(U)	n/a	0.24 [b]	Maximum detected concentration
Chrysene	6	1	0.061	0.39(U)	n/a	0.061 [b]	Maximum detected concentration
Fluoranthene	6	1	0.13	0.39(U)	n/a	0.13 [b]	Maximum detected concentration
Phenanthrene	6	1	0.066	0.39(U)	n/a	0.066 [b]	Maximum detected concentration
Pyrene	6	1	0.11	0.39(U)	n/a	0.11 [b]	Maximum detected concentration
Radionuclides (pCi/g)							
Plutonium-239/240	6	2	-0.007(U)	0.282	n/a	0.28	Maximum detected concentration
Strontium-90	6	1	-0.053(U)	0.39	n/a	0.39	Maximum detected concentration
Tritium	6	1	-0.29(U)	1.42	n/a	1.42	Maximum detected concentration

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-21
Exposure Point Concentrations at SWMU 01-007(d) for the Ecological Receptors

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Chromium	3	3	18.9	53.3	n/a[a]	53.3	Maximum detected concentration
Lead	3	3	6.6	15.6	n/a	15.6	Maximum detected concentration
Nickel	3	3	9.1	26	n/a	26	Maximum detected concentration
Nitrate	3	3	0.11	0.26	n/a	0.26	Maximum detected concentration
Selenium	3	2	0.32	0.56(U)	n/a	0.42[b]	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1260	3	3	0.0037	0.025	n/a	0.025	Maximum detected concentration
Di-n-octylphthalate	3	1	0.36(U)	0.43	n/a	0.43	Maximum detected concentration
Methylene Chloride	3	1	0.0033	0.0059(U)	n/a	0.0033[b]	Maximum detected concentration
Timethylbenzene[1,2,4-]	3	2	0.00042	0.0056(U)	n/a	0.00044[b]	Maximum detected concentration

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-22
Exposure Point Concentrations at SWMU 01-007(d) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Chromium	6	6	18.9	62.9	Normal	57.06	95% Student's t
Lead	6	6	4.3	25.7	Normal	18.45	95% Student's t
Nickel	6	6	9.1	29.8	Normal	27.61	95% Student's t
Nitrate	6	6	0.11	0.73	Normal	0.481	95% Student's t
Selenium	6	4	0.23	0.56(U)	n/a[a]	0.42[b]	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1260	6	5	0.0031	0.039(U)	n/a	0.025[b]	Maximum detected concentration
Di-n-octylphthalate	6	1	0.36 U	0.43	n/a	0.43	Maximum detected concentration
Methylene Chloride	6	4	0.0013	0.0059(U)	Normal	0.0044	95% KM (t)
Timethylbenzene[1,2,4-]	6	3	0.00042	0.006(U)	n/a	0.00057[b]	Maximum detected concentration

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-23
Exposure Point Concentrations at SWMU 01-007(e) for the Ecological Receptors

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Barium	2	2	27	53.5	n/a[a]	53.5	Maximum detected concentration
Calcium	2	2	1020	2580	n/a	2580	Maximum detected concentration
Copper	2	2	1.7	9.9	n/a	9.9	Maximum detected concentration
Nickel	2	2	4.2	7.3	n/a	7.3	Maximum detected concentration
Nitrate	2	2	1.0	1.1	n/a	1.1	Maximum detected concentration
Selenium	2	2	0.18	0.32	n/a	0.32	Maximum detected concentration
Silver	2	2	0.062	3.1	n/a	3.1	Maximum detected concentration
Organic Chemicals (mg/kg)							
Anthracene	2	1	0.079	0.37(U)	n/a	0.079[b]	Maximum detected concentration
Aroclor-1254	2	2	0.0064	0.28	n/a	0.28	Maximum detected concentration
Benzo(a)anthracene	2	1	0.37(U)	1.6	n/a	1.6	Maximum detected concentration
Benzo(a)pyrene	2	1	0.37(U)	0.88	n/a	0.88	Maximum detected concentration
Benzo(b)fluoranthene	2	1	0.37(U)	2	n/a	2	Maximum detected concentration
Benzo(g,h,i)perylene	2	1	0.37(U)	0.89	n/a	0.89	Maximum detected concentration
Benzo(k)fluoranthene	2	1	0.37(U)	1.8	n/a	1.8	Maximum detected concentration
Chrysene	2	1	0.37(U)	3	n/a	3	Maximum detected concentration
Ethylbenzene	2	1	0.0001	0.0057(U)	n/a	0.0001[b]	Maximum detected concentration
Fluoranthene	2	1	0.37(U)	1.5	n/a	1.5	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	2	1	0.37(U)	0.78	n/a	0.78	Maximum detected concentration
Phenanthrene	2	1	0.2	0.37(U)	n/a	0.2[b]	Maximum detected concentration
Pyrene	2	1	0.37(U)	1.6	n/a	1.6	Maximum detected concentration
Trichlorofluoromethane	2	1	0.00028	0.011(U)	n/a	0.00028[b]	Maximum detected concentration

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-24
Exposure Point Concentrations at SWMU 01-007(e) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Barium	4	4	27	53.5	n/a[a]	53.5	Maximum detected concentration
Calcium	4	4	949	2580	n/a	2580	Maximum detected concentration
Copper	4	4	1.7	12.4	n/a	12.4	Maximum detected concentration
Nickel	4	4	4.2	7.3	n/a	7.3	Maximum detected concentration
Nitrate	4	2	0.24(U)	1.1	n/a	1.1	Maximum detected concentration
Selenium	4	4	0.18	0.33	n/a	0.33	Maximum detected concentration
Silver	4	4	0.062	3.1	n/a	3.1	Maximum detected concentration
Organic Chemicals (mg/kg)							
Anthracene	4	2	0.045	0.4(U)	n/a	0.079[b]	Maximum detected concentration
Aroclor-1254	4	4	0.0064	0.28	n/a	0.28	Maximum detected concentration
Benzo(a)anthracene	4	2	0.11	1.6	n/a	1.6	Maximum detected concentration
Benzo(a)pyrene	4	2	0.099	0.88	n/a	0.88	Maximum detected concentration
Benzo(b)fluoranthene	4	2	0.094	2	n/a	2	Maximum detected concentration
Benzo(g,h,i)perylene	4	2	0.057	0.89	n/a	0.89	Maximum detected concentration
Benzo(k)fluoranthene	4	2	0.09	1.8	n/a	1.8	Maximum detected concentration
Chrysene	4	2	0.13	3	n/a	3	Maximum detected concentration
Ethylbenzene	4	1	0.0001	0.006(U)	n/a	0.0001[b]	Maximum detected concentration
Fluoranthene	4	2	0.26	1.5	n/a	1.5	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	4	2	0.055	0.78	n/a	0.78	Maximum detected concentration
Methylene chloride	4	2	0.0038	0.006	Nonparametric	0.004	95% KM(t)
Phenanthrene	4	2	0.2	0.4(U)	n/a	0.21[b]	Maximum detected concentration
Pyrene	4	2	0.24	1.6	Nonparametric	1.6	95% KM (BCA)
Toluene	4	1	0.0006(U)	0.006(U)	n/a	0.0015	Maximum detected concentration
Trichlorofluoromethane	4	1	0.00028	0.012(U)	n/a	0.00028[b]	Maximum detected concentration

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-25
Exposure Point Concentrations at SWMU 01-007(j) for the Ecological Receptors and Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Aroclor-1254	2	2	0.6	0.67	n/a[a]	0.67	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	2	1	0.085	0.4(U)	n/a	0.085[b]	Maximum detected concentration
Di-n-butylphthalate	2	1	0.05	0.4(U)	n/a	0.05[b]	Maximum detected concentration

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-26
Exposure Point Concentrations at SWMU 01-007(k) for the Ecological Receptors and Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	6	6	442	9730	Approximate Gamma	7751	95% Approximate Gamma
Barium	6	6	5.3	58.8	Gamma	46.44	95% Approximate Gamma
Chromium	4	4	12.2	21.3	Normal	20.14	95% Student's t
Copper	6	6	0.86	159	n/a[a]	159[b]	Maximum detected concentration
Nickel	6	6	6.4	10.3	Normal	9.67	95% Student's t
Nitrate	6	1	0.12(U)	3.1	n/a	3.1	Maximum detected concentration
Selenium	6	2	0.32	0.61(U)	n/a	0.36[b]	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acetone	6	1	0.0064	0.025(U)	n/a	0.0064 [b]	Maximum detected concentration
Methylene Chloride	6	6	0.0025	0.026	Normal	0.021	95% Student's t
Radionuclides (pCi/g)							
Uranium-235/236	6	2	0.008 U	0.197	Nonparametric	0.18	95% KM (t)

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-27
Exposure Point Concentrations at SWMU 03-009(j) for the
Ecological Receptors and Industrial, Recreational, and Residential Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	4	4	7570	11700	Normal	11263	95% Student's t
Calcium	4	4	1340	3590	n/a[a]	3590	Maximum detected concentration
Chromium	4	4	7	15.2	Normal	15.13	95% Student's t
Cyanide (total)	4	2	0.12	0.59(U)	n/a	0.16[b]	Maximum detected concentration
Lead	4	4	7.5	16.4	Normal	15.74	95% Student's t
Nickel	4	4	8.4	11.1	Nonparametric	10.69	95% Student's t
Nitrate	4	4	0.1	0.2	n/a	0.2	Maximum detected concentration

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-28
Exposure Point Concentrations at SWMU 32-001 for the Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Barium	3	3	80.8	155	n/a[a]	155[b]	Maximum detected concentration
Calcium	3	3	991	2730	n/a	2730[b]	Maximum detected concentration
Chromium	3	3	7	7.8	n/a	7.8	Maximum detected concentration
Cobalt	3	3	3.5	12.4	n/a	12.4[b]	Maximum detected concentration
Copper	3	3	6.9	16.5	n/a	16.5[b]	Maximum detected concentration
Mercury	3	2	0.0378(U)	0.41	n/a	0.41	Maximum detected concentration
Nickel	3	3	5.1	9.9	n/a	9.9[b]	Maximum detected concentration
Nitrate	1	1	3.8	3.8	n/a	3.8	Maximum detected concentration
Selenium	3	1	0.21(U)	0.31	n/a	0.31	Maximum detected concentration
Silver	3	1	0.085	2(UJ)	n/a	0.085[b]	Maximum detected concentration
Zinc	3	3	36	79.3	n/a	79.3[b]	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1260	1	1	0.07(J)	0.07(J)	n/a	0.07	Maximum detected concentration
Dichloroethene[cis-1,2-]	2	2	0.005 (J)	0.01	n/a	0.01	Maximum detected concentration
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	1	1	9.48E-06	9.48E-06	n/a	9.48E-06	Maximum detected concentration
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	1	1	1.32E-05	1.32E-05	n/a	1.32E-05	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	1	1	7.44E-07	7.44E-07	n/a	7.44E-07	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	1	1	4.13E-07	4.13E-07	n/a	4.13E-07	Maximum detected concentration
Hexachlorodibenzofuran[1,2,3,4,7,8-]	1	1	8.63E-07	8.63E-07	n/a	8.63E-07	Maximum detected concentration
Hexachlorodibenzofuran[1,2,3,6,7,8-]	1	1	1.04E-06	1.04E-06	n/a	1.04E-06	Maximum detected concentration
Hexachlorodibenzofuran[2,3,4,6,7,8-]	1	1	1.59E-06	1.59E-06	n/a	1.59E-06	Maximum detected concentration
Methylene Chloride	3	1	0.005	0.006(U)	n/a	0.005[c]	Maximum detected concentration
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	1	1	9.64E-05	9.64E-05	n/a	9.64E-05	Maximum detected concentration

Table G-2.2-28 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	1	1	1.76E-05	1.76E-05	n/a	1.76E-05	Maximum detected concentration
Pentachlorodibenzofuran[1,2,3,7,8-]	1	1	1.52E-07	1.52E-07	n/a	1.52E-07	Maximum detected concentration
Pentachlorodibenzofuran[2,3,4,7,8-]	1	1	3.25E-06	3.25E-06	n/a	3.25E-06	Maximum detected concentration
Trichloroethene	2	2	0.006	0.009	n/a	0.009	Maximum detected concentration

[a] n/a = Not applicable.

[b] Recommended UCL exceeds the maximum detected concentration; the maximum detected concentration is used.

[c] The maximum concentration of the data set is a nondetect (U or UJ) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-29

Exposure Point Concentrations at SWMU 32-001 for the Ecological Receptors and Residential and Construction Worker Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Barium	12	12	7.6	186	Normal	138.4	95% Student's t
Calcium	12	12	579	9770	Gamma	4734	95% Approximate Gamma
Chromium	12	12	6.5	18.8	Gamma	13.55	95% Approximate Gamma
Cobalt	12	12	0.66	12.4	Normal	5.44	95% Approximate Gamma
Copper	12	12	1	16.5	Gamma	9.14	95% Approximate Gamma
Cyanide (total)	10	1	0.093	5.4(U)	n/a[a]	0.093[b]	Maximum detected concentration
Mercury	12	4	0.0164	0.41	Normal	0.15	95% KM (t)
Nickel	12	12	5.1	12.1	Normal	9.21	95% Student's t
Nitrate	10	10	2.5	18.9	Approximate Gamma	11.14	95% Approximate Gamma
Perchlorate	10	1	0.0036	0.0058(U)	n/a	0.0036	Maximum detected concentration
Selenium	12	4	0.19	0.62(U)	n/a	0.31[b]	Maximum detected concentration
Silver	12	10	0.04	2(UJ)	Normal	0.084	95% KM (t)
Zinc	12	12	11.1	79.3	Gamma	43.46	95% Approximate Gamma
Organic Chemicals (mg/kg)							
Acetone	12	4	0.0041	0.024(U)	Normal	0.0062	95% KM (t)
Aroclor-1260	10	3	0.035(U)	0.51	n/a	0.51	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	12	2	0.061	0.39(U)	n/a	0.16[b]	Maximum detected concentration
Dichloroethene[cis-1,2-]	2	2	0.005	0.01	n/a	0.01	Maximum detected concentration
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	10	6	2.62E-07	9.48E-06	Normal	4.3806E-06	95% KM (t)
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	10	3	1.12E-07(U)	1.32E-05	n/a	1.32E-05	Maximum detected concentration
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	10	1	9.06E-08(U)	5.76E-07(U)	n/a	5.57E-07[b]	Maximum detected concentration

Table G-2.2-29 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	10	1	1.52E-07(U)	3.94E-07(U)	n/a	3.16E-07[b]	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	10	2	1.59E-07(U)	7.44E-07	n/a	7.44E-07	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	10	2	1.53E-07(U)	5.51E-07	n/a	5.51E-07	Maximum detected concentration
Hexachlorodibenzofuran[1,2,3,4,7,8-]	10	3	6.06E-08(U)	8.63E-07	n/a	8.63E-07	Maximum detected concentration
Hexachlorodibenzofuran[1,2,3,6,7,8-]	10	3	5.84E-08(U)	1.04E-06	n/a	1.04E-06	Maximum detected concentration
Hexachlorodibenzofuran[2,3,4,6,7,8-]	10	4	5.88E-08(U)	1.59E-06	n/a	1.59E-06	Maximum detected concentration
Methylene Chloride	12	3	0.0022	0.0063	Normal	0.0059	95% KM (t)
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	10	9	5.75E-07	9.64E-05	Gamma	7.3666E-05	95% KM (Chebyshev)
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	10	5	2.24E-07	1.76E-05	Normal	7.8002E-06	95% KM (t)
Pentachlorodibenzodioxin[1,2,3,7,8-]	10	1	7.23E-08(U)	4.22E-07(U)	n/a	2.33E-07[b]	Maximum detected concentration
Pentachlorodibenzofuran[1,2,3,7,8-]	10	2	1E-07(U)	2.25E-07	n/a	2.25E-07	Maximum detected concentration
Pentachlorodibenzofuran[2,3,4,7,8-]	10	3	1.02E-07(U)	3.25E-06	n/a	3.25E-06	Maximum detected concentration
Phenanthrene	12	1	0.044	0.39(U)	n/a	0.044 [b]	Maximum detected concentration
Tetrachloroethene	12	1	0.00022	0.006(U)	n/a	0.00022[b]	Maximum detected concentration
Trichloroethene	12	2	0.0054(U)	0.009	n/a	0.009	Maximum detected concentration
Radionuclides (pCi/g)							
Plutonium-239/240	10	1	0.007(U)	0.049(U)	n/a	0.047 [b]	Maximum detected concentration
Strontium-90	10	1	-0.094(UJ)	0.274	n/a	0.27	Maximum detected concentration

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U or UJ) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-30
Exposure Point Concentrations at SWMU 32-004 for the Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Chromium	9	9	1	32	Gamma	17.71	95% Approximate Gamma
Copper	9	9	1.2	26	Normal	13.61	95% Student's t
Lead	9	9	9.5	200	Gamma	104.3	95% Approximate Gamma
Mercury	9	3	0.1(U)	0.55	Normal	0.32	95% KM (t)
Nickel	9	3	2(U)	6.3	Nonparametric	5.51	95% KM (t)
Silver	9	1	0.58(U)	3.3	n/a[a]	3.3	Maximum detected concentration
Zinc	9	9	20	150	Normal	94.76	95% Student's t
Organic Chemicals (mg/kg)							
Acenaphthene	9	1	0.16(U)	0.89(U)	n/a	0.19[b]	Maximum detected concentration
Acetone	2	1	0.002	0.02(U)	n/a	0.002 [b]	Maximum detected concentration
Anthracene	9	3	0.16(U)	2.3	n/a	0.76	95% KM (BCA)
Benzo(a)anthracene	9	5	0.16(U)	8.2	Gamma	3.67	95% KM (BCA)
Benzo(a)pyrene	9	5	0.16(U)	8.4	Gamma	3.84	95% KM (BCA)
Benzo(b)fluoranthene	9	6	0.12	7.8	Gamma	3.24	95% KM (BCA)
Benzo(g,h,i)perylene	9	5	0.15	4.9	Gamma	2.15	95% KM (BCA)
Benzo(k)fluoranthene	9	5	0.15	7.9	Gamma	3.47	95% KM (BCA)
Bis(2-ethylhexyl)phthalate	9	5	0.097	1.8	Normal	0.84	95% KM (t)
Butylbenzylphthalate	9	6	0.16	8.3	Normal	3.48	95% KM (t)
Chrysene	9	6	0.16(U)	14	Gamma	5.79	95% KM (BCA)
Di-n-octylphthalate	9	1	0.097	0.89(U)	n/a	0.097 [b]	Maximum detected concentration
Fluoranthene	9	8	0.18	18	Gamma	11.75	95% KM (Chebyshev)
Fluorene	9	1	0.16(U)	0.89(U)	n/a	0.19 [b]	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	9	5	0.16(U)	4.8	Gamma	2.08	95% KM (BCA)

Table G-2.2-30 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Naphthalene	9	1	0.16(U)	0.89(U)	n/a	0.23 [b]	Maximum detected concentration
Phenanthrene	9	6	0.1	11	Gamma	4.37	95% KM (BCA)
Pyrene	9	7	0.15	15	Gamma	9.81	95% KM (Chebyshev)
Radionuclides (pCi/g)							
Americium-241	8	1	0.009(U)	0.104(U)	n/a	0.091 [b]	Maximum detected concentration

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-31
Exposure Point Concentrations at SWMU 32-004 for the Ecological Receptors

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Chromium	11	11	1	44.6	Gamma	25.01	95% Approximate Gamma
Copper	11	11	1.2	26	Gamma	13.36	95% Approximate Gamma
Lead	11	11	3.7	200	Gamma	87.06	95% Approximate Gamma
Mercury	11	3	0.0142(U)	0.55	Normal	0.28	95% KM (t)
Nickel	11	5	2(U)	24.1	Gamma	10.61	95% KM (t)
Nitrate	2	1	0.24(U)	0.26	n/a[a]	0.26	Maximum detected concentration
Selenium	11	2	0.23	1.2(U)	n/a	0.25[b]	Maximum detected concentration
Silver	11	3	0.058	3.3	Nonparametric	1.85	95% KM (Chebyshev)
Zinc	11	11	20	150	Normal	84.08	95% Student's t
Organic Chemicals (mg/kg)							
Acenaphthene	11	1	0.16(U)	0.89(U)	n/a	0.19[b]	Maximum detected concentration
Acetone	4	1	0.002	0.024(U)	n/a	0.002[b]	Maximum detected concentration
Anthracene	11	3	0.16(U)	2.3	Nonparametric	0.68	95% KM (BCA)
Benzo(a)anthracene	11	5	0.16(U)	8.2	Gamma	2.60	95% KM (t)
Benzo(a)pyrene	11	5	0.16(U)	8.4	Gamma	2.71	95% KM (t)
Benzo(b)fluoranthene	11	6	0.12	7.8	Gamma	2.84	95% KM (BCA)
Benzo(g,h,i)perylene	11	5	0.15	4.9	Gamma	1.60	95% KM (t)
Benzo(k)fluoranthene	11	5	0.15	7.9	Gamma	2.54	95% KM (t)
Bis(2-ethylhexyl)phthalate	11	6	0.097	1.8	Normal	0.72	95% KM (t)
Butylbenzylphthalate	11	6	0.16	8.3	Normal	2.89	95% KM (t)
Chrysene	11	6	0.16(U)	14	Gamma	4.71	95% KM (BCA)
Di-n-octylphthalate	11	1	0.097	0.89(U)	n/a	0.097[b]	Maximum detected concentration
Fluoranthene	11	8	0.18	18	Gamma	9.85	95% KM (Chebyshev)
Fluorene	11	1	0.16(U)	0.89(U)	n/a	0.19[b]	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	11	5	0.16(U)	4.8	Gamma	1.56	95% KM (t)

Table G-2.2-31 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Naphthalene	11	1	0.16(U)	0.89(U)	n/a	0.23[b]	Maximum detected concentration
Phenanthrene	11	6	0.1	11	Gamma	3.43	95% KM (t)
Pyrene	11	7	0.15	15	Gamma	4.71	95% KM (BCA)
Radionuclides (pCi/g)							
Americium-241	10	1	0.009(U)	0.104(U)	n/a	0.091[b]	Maximum detected concentration

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-32
Exposure Point Concentrations at SWMU 32-004 for the Residential and Construction Worker Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Chromium	12	12	1	44.6	Gamma	24.59	95% Approximate Gamma
Copper	12	12	1.2	26	Gamma	12.15	95% Approximate Gamma
Lead	12	12	0.21	200	Gamma	79.4	95% Approximate Gamma
Mercury	12	3	0.0142(U)	0.55	Normal	0.27	95% KM (t)
Nickel	12	6	2(U)	24.1	Normal	10.77	95% KM (t)
Nitrate	3	1	0.22(U)	0.26	n/a[a]	0.26	Maximum detected concentration
Selenium	12	3	0.22	1.2(U)	Normal	0.28	95% KM (t)
Silver	12	4	0.23	3.3	Nonparametric	1.63	95% KM (Chebyshev)
Zinc	12	12	0.14	150	Gamma	85.4	95% Approximate Gamma
Organic Chemicals (mg/kg)							
Acenaphthene	12	1	0.16(U)	0.89(U)	n/a	0.19[b]	Maximum detected concentration
Acetone	5	1	0.002	0.024(U)	n/a	0.002 [b]	Maximum detected concentration
Anthracene	12	3	0.16(U)	2.3	na	0.65	95% KM (t)
Benzo(a)anthracene	12	5	0.16(U)	8.2	Gamma	2.40	95% KM (t)
Benzo(a)pyrene	12	5	0.16(U)	8.4	Gamma	2.71	95% KM (t)
Benzo(b)fluoranthene	12	6	0.12	7.8	Gamma	2.84	95% KM (t)
Benzo(g,h,i)perylene	12	5	0.15	4.9	Gamma	1.47	95% KM (t)
Benzo(k)fluoranthene	12	5	0.15	7.9	Gamma	2.34	95% KM (t)
Bis(2-ethylhexyl)phthalate	12	7	0.058	1.8	Normal	0.66	95% KM (t)
Butylbenzylphthalate	12	6	0.16	8.3	Normal	2.67	95% KM (t)
Chrysene	12	6	0.16(U)	14	Gamma	4.09	95% KM (t)
Di-n-octylphthalate	12	1	0.097	0.89(U)	n/a	0.097 [b]	Maximum detected concentration
Fluoranthene	12	8	0.18	18	Gamma	5.30	95% KM (BCA)
Fluorene	12	1	0.16(U)	0.89(U)	n/a	0.19 [b]	Maximum detected concentration

Table G-2.2-32 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Indeno(1,2,3-cd)pyrene	12	5	0.16(U)	4.8	Gamma	1.45	95% KM (t)
Naphthalene	12	1	0.16(U)	0.89(U)	n/a	0.23 [b]	Maximum detected concentration
Phenanthrene	12	6	0.1	11	Gamma	3.16	95% KM (t)
Pyrene	12	7	0.15	15	Gamma	4.46	95% KM (BCA)
Radionuclides (pCi/g)							
Americium-241	11	1	-0.019 U	0.104(U)	n/a	0.091 [b]	Maximum detected concentration

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-33
Exposure Point Concentrations at SWMU 41-001 for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	2	2	2150	2460	n/a[a]	2460	Maximum detected concentration
Arsenic	2	2	0.8	1.2	n/a	1.2	Maximum detected concentration
Barium	2	2	31.1	40.5	n/a	40.5	Maximum detected concentration
Calcium	2	2	958	1320	n/a	1320	Maximum detected concentration
Chromium	2	2	2.2	2.4	n/a	2.4	Maximum detected concentration
Copper	2	2	3.4	4	n/a	4	Maximum detected concentration
Iron	2	2	3700	4340	n/a	4340	Maximum detected concentration
Lead	2	2	11.4	13.8	n/a	13.8	Maximum detected concentration
Manganese	2	2	180	199	n/a	199	Maximum detected concentration
Nickel	2	2	2.1	2.1	n/a	2.1	Maximum detected concentration
Nitrate	2	2	0.91	7.2	n/a	7.2	Maximum detected concentration
Perchlorate	2	1	0.0056(U)	0.0098	n/a	0.0098	Maximum detected concentration
Vanadium	2	2	4.6	6.1	n/a	6.1	Maximum detected concentration
Zinc	2	2	29.7	33.4	n/a	33.4	Maximum detected concentration
Organic Chemicals (mg/kg)							
Benzo(b)fluoranthene	4	1	0.045	0.4(U)	n/a	0.045	Maximum detected concentration
Benzo(k)fluoranthene	4	1	0.037	0.4(U)	n/a	0.037	Maximum detected concentration
Chrysene	4	1	0.046	0.4(U)	n/a	0.046	Maximum detected concentration
Di-n-butylphthalate	4	2	0.065	0.4(U)	n/a	0.13	Maximum detected concentration
Fluoranthene	4	2	0.047	0.4(U)	n/a	0.055[b]	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	4	1	0.36	0.4(UJ)	n/a	0.36[b]	Maximum detected concentration
Pyrene	4	3	0.049	0.4(UJ)	Nonparametric	0.051	95% KM (BCA)
Toluene	4	2	0.0056(U)	0.011	Nonparametric	0.011	95% KM (t)

Table G-2.2-33 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Radionuclides (pCi/g)							
Plutonium-239/240	4	3	0.029(U)	0.368	n/a	0.37[b]	Maximum detected concentration
Tritium	4	2	-0.01(U)	0.192402	n/a	0.19[b]	Maximum detected concentration
Uranium-235/236	2	1	0.08(U)	0.152	n/a	0.15	Maximum detected concentration

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U or UJ) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-34
Exposure Point Concentrations at SWMU 41-001 for Ecological Receptors

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	18	18	1630	3320	Normal	2712	95% Student's t
Arsenic	18	5	0.27(U)	1.2	Normal	0.78	95% KM (t)
Barium	18	18	14.6	40.5	Normal	27.18	95% Student's t
Calcium	18	18	796	2870	Gamma	1736	95% Approximate Gamma
Chromium	18	16	0.84(U)	2.4	Normal	2.02	95% KM (t)
Copper	18	18	1.8	4	Normal	2.91	95% Student's t
Iron	18	18	1810	4340	Normal	3136	95% Student's t
Lead	18	18	5.6	13.8	Normal	10.42	95% Student's t
Manganese	18	18	95.7	206	Normal	151.9	95% Student's t
Nickel	18	18	1.6	2.6	Normal	2.24	95% Student's t
Nitrate	18	17	0.11	13.3	Lognormal	5.143	95% KM (Chebyshev)
Perchlorate	18	2	0.0052	0.0098	n/a[a]	0.0098	Maximum detected concentration
Selenium	18	1	0.21	0.61(U)	n/a	0.21[b]	Maximum detected concentration
Vanadium	18	18	1.6	6.1	Normal	3.91	95% Student's t
Zinc	18	18	12.7	34.8	Normal	25.86	95% Student's t
Organic Chemicals (mg/kg)							
Benzo(b)fluoranthene	22	1	0.045	0.4(U)	n/a	0.045[b]	Maximum detected concentration
Benzo(k)fluoranthene	22	1	0.037	0.4(U)	n/a	0.037[b]	Maximum detected concentration
Benzyl Alcohol	22	1	0.038	0.74(U)	n/a	0.038[b]	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	22	2	0.072	0.4(U)	n/a	0.13[b]	Maximum detected concentration
Chrysene	22	1	0.046	0.4(U)	n/a	0.046[b]	Maximum detected concentration
Di-n-butylphthalate	22	4	0.065	0.4(U)	Normal	0.11	95% KM (t)
Fluoranthene	22	3	0.037	0.4(U)	n/a	0.055[b]	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	22	1	0.35(U)	0.4(UJ)	n/a	0.36[b]	Maximum detected concentration

Table G-2.2-34 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Pyrene	22	3	0.049	0.4(U)	n/a	0.051[b]	Maximum detected concentration
Toluene	22	5	0.00039	0.015	Normal	0.0042	95% KM (t)
Radionuclides (pCi/g)							
Plutonium-239/240	22	8	-0.017(U)	0.368	Normal	0.12	95% KM (t)
Tritium	22	6	-0.16(U)	1.02	Nonparametric	0.448	95% KM (Chebyshev)
Uranium-235/236	18	3	0.03(U)	0.294	Normal	0.178	95% KM (t)

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U or UJ) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-35
Exposure Point Concentrations at SWMU 41-001 for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	29	29	1630	4370	Normal	3071	95% Student's t
Arsenic	29	8	0.27(U)	1.2	Approximate Gamma	0.79	95% KM (t)
Barium	29	29	14.6	68.7	Nonparametric	30.42	95% Student's t
Calcium	29	29	796	3370	Gamma	1872	95% Approximate Gamma
Chromium	29	27	0.84(U)	32	Nonparametric	8.04	95% KM (Chebyshev)
Copper	29	29	1.8	4.1	Gamma	3.03	95% Approximate Gamma
Iron	29	29	1810	6120	Gamma	3371	95% Approximate Gamma
Lead	29	29	5.6	13.8	Normal	10.54	95% Student's t
Manganese	29	29	95.7	278	Gamma	167.6	95% Approximate Gamma
Nickel	29	29	1.6	15.9	Nonparametric	3.75	95% Student's t
Nitrate	29	28	0.11	15.7	Lognormal	5.013	95% KM (Chebyshev)
Perchlorate	28	5	0.0027	0.0098	Normal	0.00519	95% KM (t)
Selenium	29	1	0.21	0.61(U)	n/a[a]	0.21[b]	Maximum detected concentration
Vanadium	29	29	1.6	7.5	Gamma	4.27	95% KM (t)
Zinc	29	29	12.7	41.8	Normal	25.97	95% Student's t
Organic Chemicals (mg/kg)							
Acetone	34	1	0.0033(U)	0.024(U)	n/a	0.004[b]	Maximum detected concentration
Anthracene	34	1	0.048	0.4(U)	n/a	0.048[b]	Maximum detected concentration
Benzo(a)pyrene	34	2	0.13	0.4(U)	n/a	0.25[b]	Maximum detected concentration
Benzo(b)fluoranthene	34	3	0.045	0.4(U)	Normal	0.26	95% KM (t)
Benzo(g,h,i)perylene	34	2	0.072	0.4(U)	n/a	0.14[b]	Maximum detected concentration
Benzo(k)fluoranthene	34	3	0.037	0.4(U)	n/a	0.1[b]	Maximum detected concentration
Benzyl Alcohol	34	2	0.038	0.74(U)	n/a	0.038[b]	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	34	2	0.072	0.4(U)	n/a	0.13[b]	Maximum detected concentration

Table G-2.2-35 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Chrysene	34	3	0.046	0.4(U)	Normal	0.073	95% KM (t)
Di-n-butylphthalate	34	4	0.065	0.4(U)	Normal	0.112	95% KM (t)
Fluoranthene	34	3	0.037	0.4(U)	n/a	0.055[b]	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	34	3	0.063	0.4(UJ)	Normal	0.18	95% KM (t)
Pyrene	34	5	0.049	0.4(U)	Normal	0.063	95% KM (t)
Toluene	34	6	0.00039	0.015	Normal	0.0056	95% KM (t)
Radionuclides (pCi/g)							
Plutonium-239/240	34	9	-0.029(U)	0.368	Normal	0.093	95% KM (t)
Tritium	34	7	-0.16(U)	1.02	Lognormal	0.31	95% KM (Chebyshev)
Uranium-235/236	29	3	0.03(U)	0.294	Normal	0.17	95% KM (t)

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U or UJ) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-36
Exposure Point Concentrations at AOC 43-001(b2) for the Recreational Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Arsenic	11	11	0.83	2.8	Normal	1.868	95% Student's t
Cadmium	11	11	0.065	0.47	Gamma	0.224	95% Approximate Gamma
Chromium	11	11	4.5	29.1	Approximate Gamma	12.94	95% Approximate Gamma
Copper	11	11	2.8	13.4	Normal	10.24	95% Student's t
Cyanide (total)	11	10	0.21	6.9	Gamma	3.06	95% Approximate Gamma
Lead	11	11	9.5	117	Gamma	57.94	95% Approximate Gamma
Nickel	11	11	2.8	12	Nonparametric	6.222	95% Student's t
Nitrate	11	8	0.2	1.8	Normal	1.064	95% KM (t)
Selenium	11	7	0.2	0.67(U)	Normal	0.27	95% Student's t
Zinc	11	11	39.9	147	Normal	109.3	95% Student's t
Organic Chemicals (mg/kg)							
Acenaphthene	11	7	0.15	1	Normal	0.52	95% KM (t)
Anthracene	11	7	0.26	1.9	Normal	0.87	95% KM (t)
Aroclor-1254	11	1	0.012	0.047(U)	n/a[a]	0.012[b]	Maximum detected concentration
Aroclor-1260	11	8	0.0083	0.083	Gamma	0.035	95% KM (Percentile Bootstrap)
Benzo(a)anthracene	11	10	0.11	5.7	Gamma	3.48	95% KM (Chebyshev)
Benzo(a)pyrene	11	10	0.13	5.6	Gamma	3.41	95% KM (Chebyshev)
Benzo(b)fluoranthene	11	10	0.13	6.2	Gamma	3.66	95% KM (Chebyshev)
Benzo(g,h,i)perylene	11	10	0.066	2.5	Gamma	1.54	95% KM (Chebyshev)
Benzo(k)fluoranthene	11	10	0.13	5.5	Gamma	3.45	95% KM (Chebyshev)
Bis(2-ethylhexyl)phthalate	11	9	0.059	0.75	Gamma	0.30	95% KM (BCA)
Butylbenzylphthalate	11	3	0.059	0.47(U)	Lognormal	0.28	95% KM (t)
Chrysene	11	10	0.13	6	Gamma	3.75	95% KM (Chebyshev)

Table G-2.2-36 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Dibenz(a,h)anthracene	11	5	0.11	0.96	Gamma	0.42	95% KM (t)
Dibenzofuran	11	7	0.069	0.49	Normal	0.30	95% KM (t)
Di-n-butylphthalate	11	1	0.066	0.47(U)	n/a	0.066b	Maximum detected concentration
Fluoranthene	11	10	0.25	15	Gamma	9.12	95% KM (Chebyshev)
Fluorene	11	7	0.16	0.84	Normal	0.50	95% KM (t)
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	11	11	8.84E-06	5.96E-04	Approximate Gamma	2.06E-04	95% Approximate Gamma
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	11	11	1.09E-06	7.64E-05	Lognormal	2.9E-05	95% Chebyshev (MVUE)
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	11	9	2.21E-07(U)	7.17E-06	Lognormal	3.93E-06	95% KM (Chebyshev)
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	11	8	2.87E-07(U)	3.93E-06	Nonparametric	1.51E-06	95% KM (BCA)
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	11	11	2.96E-07	2.13E-05	Lognormal	7.14E-06	95% Chebyshev (MVUE)
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	11	8	3.49E-07(U)	6.41E-06	Lognormal	2.47E-06	95% KM (BCA)
Hexachlorodibenzofuran[1,2,3,4,7,8-]	11	9	1.75E-07(U)	2.89E-06	Normal	1.64E-06	95% KM (t)
Hexachlorodibenzofuran[1,2,3,6,7,8-]	11	8	1.79E-07(U)	2.08E-06	Gamma	8.77E-07	95% KM (Percentile Bootstrap)
Hexachlorodibenzofuran[1,2,3,7,8,9-]	11	7	5.65E-08(U)	6.59E-07	Approximate Gamma	2.91E-07	95% KM (Percentile Bootstrap)
Hexachlorodibenzofuran[2,3,4,6,7,8-]	11	9	1.38E-07(U)	3.59E-06	Lognormal	2.09E-06	95% KM (Chebyshev)
Indeno(1,2,3-cd)pyrene	11	10	0.06	2.4	Gamma	1.46	95% KM (Chebyshev)
Methylene Chloride	11	1	0.0016	0.0071(U)	n/a	0.0016	Maximum detected concentration
Methylnaphthalene[2-]	11	7	0.05	0.47(U)	Normal	0.21	95% KM (t)
Naphthalene	11	7	0.081	0.9	Normal	0.44	95% KM (t)
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	11	11	8.92E-05	6.66E-03	Lognormal	2.6E-03	95% Chebyshev (MVUE)
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	11	11	3.03E-06	2.19E-04	Lognormal	7.55E-05	95% Chebyshev (MVUE)
Pentachlorodibenzodioxin[1,2,3,7,8-]	11	8	1.54E-07(U)	2.95E-06	Approximate Gamma	1.13E-06	95% KM (Percentile Bootstrap)

Table G-2.2-36 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Pentachlorodibenzofuran[1,2,3,7,8-]	11	8	1.45E-07(U)	1.43E-06	Normal	7.66E-07	95% KM (t)
Pentachlorodibenzofuran[2,3,4,7,8-]	11	8	1.84E-07(U)	2.33E-06	Gamma	9.9E-07	95% KM (Percentile Bootstrap)
Phenanthrene	11	10	0.14	11	Gamma	7.05	95% KM (Chebyshev)
Pyrene	11	10	0.22	18	Gamma	10.25	95% KM (Chebyshev)
Styrene	11	1	0.00041	0.0069(U)	n/a	0.00041	Maximum detected concentration
Tetrachlorodibenzodioxin[2,3,7,8-]	11	3	3.97E-08(U)	4.01E-07	n/a	4.01E-07	Maximum detected concentration
Tetrachlorodibenzofuran[2,3,7,8-]	11	4	1.05E-07(U)	1.71E-06	n/a	1.71E-06	Maximum detected concentration
Radionuclides (pCi/g)							
Uranium-235/236	11	1	0.01(U)	0.211	n/a	0.21	Maximum detected concentration

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U or UJ) and thus the maximum detected concentration is less than the maximum concentration.

Table G-2.2-37
Exposure Point Concentrations at AOC 43-001(b2) for the Ecological Receptors and Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Arsenic	23	23	0.68	2.9	Normal	1.862	95% Student's t
Barium	23	23	8.5	81.1	Gamma	34.06	95% Approximate Gamma
Cadmium	23	22	0.039	0.47	Gamma	0.16	95% KM (BCA)
Chromium	23	23	4.5	29.1	Approximate Gamma	9.89	95% Approximate Gamma
Copper	23	23	2	13.4	Lognormal	7.75	95% H-UCL
Cyanide (total)	23	16	0.11	6.9	Lognormal	2.29	95% KM (Chebyshev)
Lead	23	23	4.6	117	Gamma	34.6	95% Approximate Gamma
Nickel	23	23	2.8	12	Approximate Gamma	5.25	95% Approximate Gamma
Nitrate	23	16	0.12	1.8	Gamma	0.659	95% KM (Percentile Bootstrap)
Selenium	23	15	0.2	0.73(U)	Normal	0.28	95% Student's t
Zinc	23	23	31	147	Approximate Gamma	81.05	95% Approximate Gamma
Organic Chemicals (mg/kg)							
Acenaphthene	23	10	0.045	1	Normal	0.35	95% KM (t)
Anthracene	23	11	0.037	1.9	Gamma	0.52	95% KM (t)
Aroclor-1254	23	1	0.012	0.048(U)	n/a[a]	0.012[b]	Maximum detected concentration
Aroclor-1260	23	11	0.0044	0.083	Gamma	0.024	95% KM (t)
Benzo(a)anthracene	23	15	0.099	5.7	Gamma	1.28	95% KM (BCA)
Benzo(a)pyrene	23	15	0.11	5.6	Gamma	1.28	95% KM (BCA)
Benzo(b)fluoranthene	23	15	0.099	6.2	Gamma	1.31	95% KM (BCA)
Benzo(g,h,i)perylene	23	15	0.066	2.5	Gamma	0.60	95% KM (BCA)
Benzo(k)fluoranthene	23	15	0.1	5.5	Gamma	1.27	95% KM (BCA)
Bis(2-ethylhexyl)phthalate	23	14	0.047	0.75	Lognormal	0.26	95% KM (BCA)
Butylbenzylphthalate	23	3	0.059	0.48(U)	Lognormal	0.28	95% KM (t)

Table G-2.2-37 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Carbon Disulfide	23	1	0.0005	0.0073(UJ)	n/a	0.0005[b]	Maximum detected concentration
Chrysene	23	16	0.05	6	Approximate Gamma	1.37	95% KM (BCA)
Dibenz(a,h)anthracene	23	5	0.11	0.96	Gamma	0.33	95% KM (t)
Dibenzofuran	23	8	0.069	0.49	Normal	0.26	95% KM (t)
Di-n-butylphthalate	23	1	0.066	0.48(U)	n/a	0.066[b]	Maximum detected concentration
Fluoranthene	23	18	0.045	15	Approximate Gamma	5.02	95% KM (Chebyshev)
Fluorene	23	10	0.044	0.84	Normal	0.35	95% KM (t)
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	23	23	8.84E-07	5.96E-04	Gamma	1.38E-04	95% Approximate Gamma
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	23	19	1.46E-07(U)	7.64E-05	Approximate Gamma	2.55E-05	95% KM (Chebyshev)
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	23	15	5.96E-08(U)	7.17E-06	Gamma	1.5E-06	95% KM (BCA)
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	23	12	9.12E-08(U)	3.93E-06	Gamma	9.08E-07	95% KM (t)
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	23	18	1.09E-07(U)	2.13E-05	Lognormal	7.2E-06	95% KM (Chebyshev)
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	23	14	9.34E-08(U)	6.41E-06	Gamma	1.54E-06	95% KM (BCA)
Hexachlorodibenzofuran[1,2,3,4,7,8-]	23	14	4.76E-08(U)	2.89E-06	Normal	9.74E-07	95% KM (t)
Hexachlorodibenzofuran[1,2,3,6,7,8-]	23	12	4.82E-08(U)	2.08E-06	Gamma	5.42E-07	95% KM (t)
Hexachlorodibenzofuran[1,2,3,7,8,9-]	23	8	5.65E-08(U)	6.59E-07	Gamma	2.11E-07	95% KM (t)
Hexachlorodibenzofuran[2,3,4,6,7,8-]	23	15	5.6E-08(U)	3.59E-06	Gamma	8.52E-07	95% KM (Percentile Bootstrap)
Indeno(1,2,3-cd)pyrene	23	15	0.06	2.4	Gamma	0.57	95% KM (BCA)
Methylene Chloride	23	3	0.001	0.0073(U)	Normal	0.0016	95% KM (t)
Methylnaphthalene[2-]	23	8	0.05	0.48(U)	Normal	0.20	95% KM (t)
Naphthalene	23	9	0.04	0.9	Gamma	0.28	95% KM (t)
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	23	23	5.1E-06	6.66E-03	Gamma	1.58E-03	95% Approximate Gamma
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	23	19	5.71E-07(U)	2.19E-04	Lognormal	7.2E-05	95% KM (Chebyshev)
Pentachlorodibenzodioxin[1,2,3,7,8-]	23	10	5.19E-08(U)	2.95E-06	Gamma	7.05E-07	95% KM (t)

Table G-2.2-37 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Pentachlorodibenzofuran[1,2,3,7,8-]	23	13	5.15E-08(U)	2.66E-06	Gamma	6.82E-07	95% KM (t)
Pentachlorodibenzofuran[2,3,4,7,8-]	23	11	5.05E-08(U)	2.33E-06	Gamma	6.59E-07	95% KM (t)
Phenanthrene	23	16	0.05	11	Gamma	2.51	95% KM (BCA)
Pyrene	23	18	0.041	18	Gamma	5.44	95% KM (Chebyshev)
Styrene	23	1	0.00041	0.0073(U)	n/a	0.00041b	Maximum detected concentration
Tetrachlorodibenzodioxin[2,3,7,8-]	23	3	2.94E-08(U)	4.01E-07	n/a	4.01E-07	Maximum detected concentration
Tetrachlorodibenzofuran[2,3,7,8-]	23	4	3.26E-08(U)	1.71E-06	n/a	1.71E-06	Maximum detected concentration
Trimethylbenzene[1,2,4-]	23	1	0.00033(U)	0.0055(U)	n/a	0.0006b	Maximum detected concentration
Radionuclides (pCi/g)							
Uranium-235/236	23	2	0.007(U)	0.216	Nonparametric	0.21	95% KM (t)

[a] n/a = Not applicable.

[b] The maximum concentration of the data set is a nondetect (U or UJ) and thus the maximum detected concentration is less than the maximum concentration.

Table G-3.2-1
Physical and Chemical Properties of Inorganic COPCs
at Upper Los Alamos Canyon Aggregate Area

COPC	K_d[a] (cm^3/g)	Water Solubility[a, b] (g/L)
Aluminum	1500	Insoluble
Antimony	45	Insoluble
Arsenic	29	Insoluble
Barium	41	Insoluble
Beryllium	790	Insoluble
Cadmium	75	Insoluble
Chromium	850[c]	Insoluble
Cobalt	45	Insoluble
Copper	35	Insoluble
Cyanide (total)	9.9	na[d]
Iron	25	Insoluble
Lead	900	Insoluble
Manganese	65	Insoluble
Mercury	52	Insoluble
Nickel	65	Insoluble
Nitrate	0.0356	na
Perchlorate	na	2.45E+05
Selenium	5	Insoluble
Silver	8.3	Insoluble
Thallium	71[e]	Insoluble
Vanadium	1000	Insoluble
Zinc	62	Insoluble

[a] Information from http://rais.ornl.gov/cgi-bin/tox/TOX_select?select=nrad.

[b] Denotes reference information from http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm.

[c] As chromium salts.

[d] na = Not available.

[e] As thallium salts.

Table G-3.2-2
Physical and Chemical Properties of Radionuclide COPCs
at Upper Los Alamos Canyon Aggregate Area

Analyte	Soil-Water Partition Coefficient, K_d[a] (cm^3/g)	Water Solubility[b] (g/L)
Americium-241	680	Insoluble
Cesium-134	1000	Insoluble
Cesium-137	1000	Insoluble
Plutonium-238	4500	Insoluble
Plutonium-239/240	4500	Insoluble
Strontium-90	35	Insoluble
Tritium	9.9	Soluble
Uranium-234	0.4	Insoluble
Uranium-235/236	0.4	Insoluble
Uranium-238	0.4	Insoluble

[a] Denotes reference information from Superfund Chemical Data Matrix (EPA 1996, 064708).

[b] Denotes reference information from http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm.

Table G-3.2-3
Physical and Chemical Properties of Organic COPCs
at Upper Los Alamos Canyon Aggregate Area

COPC	Water Solubility[a] (mg/L)	Organic Carbon Coefficient K_{oc}[a] (L/kg)	Log Octanol-Water Partition Coefficient K_{ow}[a]	Vapor Pressure[a] (mm Hg at 25°C)
Acenaphthene	3.6E+00[b]	6.12E+03	3.92E+00[b]	2.5E-03[b]
Acenaphthylene	1.61E+01	6.12E+03	3.94E+00	9.12E-04
Acetone	1.00E+06[b]	1.98E+00	-2.40E-01[b]	2.31E+02[b]
Anthracene	4.34E-02[b]	2.04E+04	4.45E+00[b]	2.67E-06[b]
Aroclor-1248	5.32E-02	4.39E+04	6.34E+00	4.94E-04
Aroclor-1254	3.40E-03[b]	5.30E+05[c]	6.79E+00[b]	6.53E-06[b]
Aroclor-1260	2.84E-04[b]	5.30E+05[c]	8.27E+00[b]	4.05E-05[b]
Benzene	1.79E+03	1.66E+02	2.13E+00	9.48E+01
Benzo(a)anthracene	9.40E-03[b]	2.31E+05	5.76+00[b]	1.90E-06[b]
Benzo(a)pyrene	1.62E-03[b]	7.87E+05	6.13E+00[b]	5.49E-09[b]
Benzo(b)fluoranthene	1.50E-03[b]	8.03E+05	5.78E+00[b]	5.00E-07[b]
Benzo(g,h,i)perylene	2.60E-04[b]	2.68E+06	6.63E+00[b]	1.00E-10[b]
Benzoic Acid	3.40E+03[b]	1.45E+01	1.87E+00[b]	7.00E-04[b]
Benzo(k)fluoranthene	8.00E-04[b]	7.87E+05	6.1E+00[b]	9.65E-10[b]
Benzyl Alcohol	4.29E+04	1.57E+01	1.10E+00	9.40E-02
Bis(2-ethylhexyl)phthalate	2.70E-01[b]	1.65E+05	7.60E+00[b]	1.42E-07[b]
Bromobenzene	4.46E+02	2.68E+02	2.99E+00	4.18E+00
Bromomethane	1.52E+04	1.43E+01	1.19E+00	1.62E+03
Butanone[2-]	2.23E+05	3.83E+00	2.9E-01	9.06E+01
Butylbenzene[n-]	1.18E+01	1.76E+03	4.38E+00	1.06E+00
Butylbenzene[sec-]	1.76E+01	1.58E+03	4.57E+00	1.75E+00
Butylbenzene[tert-]	2.95E+01	1.18E+03	4.11E+00	2.20E+00
Butylbenzylphthalate	2.69E+00	9.36E+03	4.73E+00	8.25E-06
Carbazole	1.8E+00	1.13E+04	3.72E+00	7.5E-07
Carbon Disulfide	1.18E+03	1.00E+00	1.94E+00	3.59E+02
Chloroform	7.95E+03	3.5E+01	1.97E+00	1.97E+02
Chloromethane	5.32E+03	1.43E+01	9.10E-01	4.30E+03
Chlorotoluene[4-]	1.06E+02	4.34E+02	3.33E+00	2.69E+00
Chrysene	6.30E-03[b]	2.36E+05	5.81E+00[b]	6.23E-09[b]
Dibenz(a,h)anthracene	1.03E-03	2.62E+06	6.54E+00	1.39E-11
Dibenzofuran	3.1E+00	1.13E+04	4.12E+00	2.48E-03
Dichlorobenzene[1,2-]	8.00E+01	4.43E+02	3.43E+00	1.47E+00
Dichlorobenzene[1,3-]	1.25E+02	4.34E+02	3.53E+00	2.15E+00
Dichlorodifluoromethane	2.80E+02	4.86E+01	2.16E+00	4.85E+03

Table G-3.2-3 (continued)

COPC	Water Solubility[a] (mg/L)	Organic Carbon Coefficient K_{oc}[a] (L/kg)	Log Octanol-Water Partition Coefficient K_{ow}[a]	Vapor Pressure[a] (mm Hg at 25°C)
Di-n-butylphthalate	1.12E+01	1.46E+03	4.50E+00	2.01E-05
Di-n-octylphthalate	2.00E-02	1.96E+05	8.1E+00	1.07E-07
Dinitro-2-methylphenol[4,6-]	na[d]	na	na	na
Ethylbenzene	1.69E+02	5.18E+02	3.15E+00	9.6E+00
Fluoranthene	2.06E-01[c]	7.09E+04[c]	5.16E+00[c]	9.22E-06[c]
Fluorene	1.89E+00[b]	1.13E+04	4.18E+00[b]	8.42E-04[b]
Hexachlorobenzene	6.20E-03	3.38E+03	5.73E+00	1.80E-05
Hexanone[2-]	1.75E+04	1.30E+01	1.38E+00	1.16E+01
Indeno(1,2,3-cd)pyrene	1.90E-04[b]	2.68E+06	6.70E+00[b]	1.25E-10[b]
Isopropylbenzene	6.13E+01	8.17E+02	3.66E+00	4.5E+00
Isopropyltoluene[4-]	2.34E+01[b]	na	4.10E+00[b]	1.64E+00[b]
Methylene Chloride	1.30E+04[b]	2.37E+01	1.30E+00[b]	4.30E+02[b]
Methylnaphthalene[2-]	2.46E+01	2.98E+03	3.86E+00	5.50E-02
Naphthalene	3.1E+01	1.84E+03	3.3E+00	8.5E-02
Pentachlorophenol	1.40E+01	3.38E+03	1.40E+01	1.10E-04
Phenanthrene	1.15E+00[b]	2.08E+04	4.46E+00[b]	1.12E-04[b]
Propylbenzene[1-]	5.22E+01	9.55E+02	3.69E+00	3.42E+00
Pyrene	1.35E-01[b]	6.94E+04	4.88E+00[b]	4.50E-06[b]
Styrene	3.10E+02	5.18E+02	2.95E+00	6.4E+00
TCDD[2,3,7,8-]	2.00E-04	1.46E+05	na	na
Tetrachloroethene (tetrachloroethylene)	2.06E+02	1.07E+02	3.4E+00	1.85E+01
Toluene	5.26E+02	2.68E+02	2.73E+00	2.84E+01
Total Petroleum Hydrocarbon-Gasoline Range Organics	na	na	na	na
Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.70E+02	2.25E+02	3.16E+00	3.63E+02
Trichlorobenzene[1,2,4-]	5.70E+01	7.18E+02	3.63E+00	2.10E+00
Trichlorofluoromethane	1.10E+03	4.86E+01	2.53E+00	8.03E+02
Trimethylbenzene[1,2,4-]	5.70E+01	7.18E+02	3.63E+00	2.1E+00
Trimethylbenzene[1,3,5-]	4.82E+01	7.03E+02	3.42E+00	2.1E+00
Vinyl Chloride	8.80E+03	2.37E+01	1.62E+00	2.98E+03
Xylene (Total)	1.06E+02	4.43E+02	3.12E+00	7.99E+00
Xylene[1,2-] (o-xylene)	1.61E+02	4.34E+02	3.2E+00	8.29E+00
Xylene[1,3-]+Xylene[1,4-] (m-xylene + p-xylene)	1.06E+02	4.43E+02	3.12E+00	7.99E+00

[a] Information from http://rais.ornl.gov/cgi-bin/tox/TOX_select?select=nrad, unless noted otherwise.

[b] Information from http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm.

[c] Information from NMED 2006, 092513.

[d] na = Not available.

Table G-4.0-1
Risk Scenarios Evaluated
for the Upper Los Alamos Canyon Aggregate Area Sites

SWMU or AOC	Industrial Scenario	Recreational Scenario	Construction Worker	Residential Scenario
00-031(a)	No	No	No	Yes
01-001(b)	No	Yes	No	Yes
01-001(c)	Yes	Yes	Yes	Yes
01-001(e)	No	No	No	Yes
01-001(t)	No	No	No	Yes
01-001(u)	No	No	No	Yes
01-002	No	No	No	Yes
01-003(e)	Yes	Yes	No	Yes
01-006(d)	Yes	Yes	Yes	Yes
01-006(g)	No	Yes	No	Yes
01-006(o)	No	No	No	Yes
01-007(d)	No	No	No	Yes
01-007(e)	No	No	No	Yes
01-007(j)	No	No	No	Yes
01-007(k)	No	No	No	Yes
03-009(j)	Yes	Yes	No	Yes
32-001	Yes	No	Yes	Yes
32-004	Yes	No	Yes	Yes
41-001	Yes	Yes	No	Yes
43-001(b2)	No	Yes	No	Yes

Table G-4.1-1
Exposure Parameter Values Used to Calculate
Chemical SSLs for the Industrial and Residential Scenarios

Parameters	Residential Values	Industrial Values	Construction Worker Values	Recreational Values
Target HQ	1	1	1	1
Target cancer risk	10^{-5}	10^{-5}	10^{-5}	10^{-5}
Averaging time (carcinogen)	70 yr x 365 days	70 yr x 365 days	70 yr x 365 days	70 yr x 365 days
Averaging time (noncarcinogen)	ED x 365 days	ED x 365 days	ED x 365 days	ED x 365 days
Skin absorption factor	Semivolatile organic compound (SVOC) = 0.1	SVOC = 0.1	SVOC = 0.1	SVOC = 0.1
	Chemical-specific	Chemical-specific	Chemical-specific	Chemical-specific
Adherence factor–child	0.2 mg/cm^2	n/a[a]	n/a	0.2 mg/cm^2
Body weight–child	15 kg (0–6 years of age)	n/a	n/a	31 kg (6–11 years of age)
Cancer slope factor–oral (chemical-specific)	(mg/kg-day)$^{-1}$	(mg/kg-day)$^{-1}$	(mg/kg-day)$^{-1}$	(mg/kg-day)$^{-1}$
Cancer slope factor–inhalation (chemical-specific)	(mg/kg-day)$^{-1}$	(mg/kg-day)$^{-1}$	(mg/kg-day)$^{-1}$	(mg/kg-day)$^{-1}$
Exposure frequency	350 day/yr	225 day/yr	250 day/yr	225 events/yr
Exposure duration–child	6 yr	n/a	n/a	6 yr
Age-adjusted ingestion factor	114 mg-yr/kg-day	n/a	n/a	22.6 mg-yr/kg-day
Age-adjusted inhalation factor	11 m^3-yr/kg-day	n/a	n/a	0.8 m^3-yr/kg-day
Inhalation rate–child	10 m^3/day	n/a	n/a	1.2 m^3/day
Soil ingestion rate–child	200 mg/day	n/a	n/a	71.4 mg/day
Particulate emission factor	6.61 x 10^9 m^3/kg	6.61 x 10^9 m^3/kg	2.1 x 10^6 m^3/kg	6.61 x 10^9 m^3/kg
Reference dose–oral (chemical-specific)	(mg/kg-day)	(mg/kg-day)	(mg/kg-day)	(mg/kg-day)
Reference dose–inhalation (chemical-specific)	(mg/kg-day)	(mg/kg-day)	(mg/kg-day)	(mg/kg-day)
Exposed surface area–child	2800 cm^2/day	n/a	n/a	3525 cm^2/day
Age-adjusted skin contact factor for carcinogens	361 mg-yr/kg-day	n/a	n/a	273.3 mg-yr/kg-day
Volatilization factor for soil (chemical-specific)	(m^3/kg)	(m^3/kg)	(m^3/kg)	(m^3/kg)
Body weight–adult	70 kg	70 kg	70 kg	70 kg
Exposure duration[b]	30 yr	25 yr	1 yr	30 yr
Adherence factor–adult	0.07 mg/cm^2	0.2 mg/cm^2	0.3 mg/cm^2	0.07 mg/cm^2
Soil ingestion rate–adult	100 mg/day	100 mg/day	330 mg/day	25.6 mg/day
Exposed surface area–adult	5700 cm^2/day	3300 cm^2/day	3300 cm^2/day	5700 cm^2/day
Inhalation rate–adult	20 m^3/day	20 m^3/day	20 m^3/day	1.6 m^3/day

Note: Parameter values from NMED 2006, 092513.

[a] n/a = Not applicable.

[b] Exposure duration for lifetime resident is 30 years. For carcinogens, the exposures are combined for child (6 yr) and adult (24 yr).

Table G-4.1-2
Parameter Values Used to Calculate Radionuclide SALs
for the Residential and Recreational Scenarios

Parameters	Residential, Adult	Residential, Child	Recreational, Adult	Residential, Child
Inhalation rate (m^3/yr)	7305[a]	3652.5[b]	14,035[c]	10,526[d]
Mass loading (g/m^3)	1.5 x 10-7[e]	1.5 x 10-7[e]	1.5 x 10-7[e]	1.5 x 10-7[e]
Outdoor time fraction	0.0599[f]	0.2236[g]	0.0228[h]	0.0228[h]
Indoor time fraction	0.8984[i]	0.7347[j]	0	0
Soil ingestion (g/yr)	36.5[k]	73[l]	225[m]	73[n]

[a] Calculated as [10 m^3/day x 350 day/yr] / [indoor + outdoor time fractions], where 10 m^3/day is the daily inhalation rate of a child (NMED 2006, 092513).

[b] Calculated as [20 m^3/day x 350 day/yr] / [indoor + outdoor time fractions], where 20 m^3/day is the daily inhalation rate of an adult (NMED 2006, 092513).

[c] Calculated as [1.60 m^3/day x 200 hr/yr] / [indoor + outdoor time fractions], where 1.6 m^3/day is the adult inhalation rate for moderate activity (EPA 1997, 066596, Table 5-23).

[d] Calculated as [1.2 m^3/day x 200 hr/yr] / [indoor + outdoor time fractions], where 1.2 m^3/day is the child inhalation rate for moderate activity (EPA 1997, 066596, Table 5-23).

[e] Calculated as [1/ 6.6 x 10^{+9} m^3/kg) x 1000 g/kg, where 6.6 x 10^{+9} m^3/kg is the particulate emission factor (2006, 092513).

[f] Calculated as [1.5 hr/day x 350 day/yr] / 8766 hr/yr, where 1.5 hr/day is an estimate of time spent outdoors for an adult 12 yr and older (EPA 1997, 066598, Section 15.4-1).

[g] Calculated as [5.6 hr/day x 350 day/yr] / 8766 hr/yr, where 5.6 hr/day is an estimate of time spent outdoors for a 3-11 yr old child (EPA 1997, 066598, Section 15.4-1).

[h] Calculated as [1 hr/day x 200 day/yr] / 8766 hr/yr, where 1 hr/day is an estimate of exposure time for a recreational adult or child (LANL 2007, 094496).

[i] Calculated as [(24-1.5 hr/day x 350 day/yr] / 8766 hr/yr.

[j] Calculated as [(24-5.6 hr/day x 350 day/yr] / 8766 hr/yr.

[k] Calculated as [0.1 g/day x 350 day/yr] / [indoor + outdoor time fractions], where 0.1 g/day is the adult soil ingestion rate (2006, 092513).

[l] Calculated as [0.2 g/day x 350 day/yr] / [indoor + outdoor time fractions], where 0.2 g/day is the child soil ingestion rate (2006, 092513).

[m] Calculated as [(0.1 g/day x 3.9 hr/day) x 200 hr/yr] / [indoor + outdoor time fractions], where 3.9 hr/day is the time-weighted average for “doers” ages 12-44 (EPA 1997, 066598, Table 15-10), and where 0.1 g/day is the adult soil-ingestion rate (NMED 2006, 092513).

[n] Calculated as [(0.4 g/day x 5.6 hr/day) x 200 hr/yr] / [indoor + outdoor time fractions], where 5.6 hr/day is the time spent outdoors for a child (EPA 1997, 066598, Section 15.4.1), and where 0.4 g/day is the upper bound child soil-ingestion rate (EPA 1997, 066598, Table 4-23).

Table G-4.1-3
Parameter Values Used to Calculate Radionuclide SALs for the Industrial and Construction Worker Scenarios

Parameters	Industrial, Adult	Construction Worker, Adult
Inhalation rate (m3/yr)	19,481[a]	19,478[b]
Mass loading (g/m3)	1.5 x 10-7[c]	0.0004[d]
Outdoor time fraction	0.2053[e]	0.2567[f]
Indoor time fraction	0	0
Soil ingestion (g/yr)	97.4[g]	321[h]

[a] Calculated as [20 m^3/day x 225 day/yr] / [indoor + outdoor time fractions], where 20 m^3/day is the daily inhalation rate of an adult and 225 days/yr is the exposure frequency (NMED 2006, 092513).

[b] Calculated as [20 m^3/day x 250 day/yr] / [indoor + outdoor time fractions], where 20 m^3/day is the daily inhalation rate of an adult and 250 days/yr is the exposure frequency (NMED 2006, 092513).

[c] Calculated as [1/ 6.6 x 10^{+9} m^3/kg) x 1000 g/kg, where 6.6 x 10^{+9} m^3/kg is the particulate emission factor (2006, 092513).

[d] Calculated as [1/ 2.1 x 10^{+6} m^3/kg) x 1000 g/kg, where 2.1 x 10^{+6} m^3/kg is the particulate emission factor (2006, 092513).

[e] Calculated as [8 hr/day x 225 day/yr] / 8766 hr/yr, where 8 hr/day is an estimate of the average length of the work day.

[f] Calculated as [9 hr/day x 250 day/yr] / 8766 hr/yr, where 9 hr/day is an estimate of the average length of the work day.

[g] Calculated as [0.1 g/day x 225 day/yr] / [indoor + outdoor time fractions], where 0.1 g/day is the adult soil ingestion rate (NMED 2006, 092513).

[h] Calculated as [0.33 g/day x 250 day/yr] / [indoor + outdoor time fractions], where 0.33 g/day is the adult soil ingestion rate (2006, 092513).

Table G-4.2-1
Residential Carcinogenic Screening for AOC 00-031(a)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Ethylbenzene	8.50E-04	57[b]	1E-10
Methylene chloride	0.04	182	2E-09
Total Excess Cancer Risk			**2E-09**

Note: SSL for ethylbenzene is the risk-based value obtained from EPA and not the saturation limit presented and noted in Table 3.1-1.

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional risk-based screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-2
Residential Noncarcinogenic Screening for AOC 00-031(a)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Selenium	0.53(U)	391	1E-03
Acetone	5.40E-02	2.81E+04	2E-06
2-Butanone	6.20E-03	3.18E+04	2E-07
sec-Butylbenzene	0.016	110[b]	2E-04
Carbon Disulfide	2.50E-04	670[c]	3.7E-07
Isopropylbenzene	3.50E-03	271	1E-05
4-Isopropyltoluene	4.20E-02	271[d]	2E-04
2-Methylnaphthalene	0.29	79.5[e]	4E-03
Naphthalene	0.11	79.5	1E-03
Trichlorofluoromethane	7.00E-04	588	1E-06
1,2,4-Trimethylbenzene	0.15	58	2E-03
1,3,5-Trimethylbenzene	0.23	24.8	9E-03
Xylene (total)	0.01	600[c]	2E-05
		HI	**0.02**

Note: SSLs for butylbenzene[sec-], carbon disulfide, and xylene(total) are the risk-based values obtained from EPA and not the saturation limits presented and noted in Table 3.1-1.

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] Risk-based screening level from EPA Region 6 (EPA 2007, 099314); not available in EPA regional table.

[c] EPA regional risk-based screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

[d] SSL for isopropylbenzene used as a surrogate based on structural similarity.

[e] SSL for napthalene used as a surrogate based on structural similarity.

Table G-4.2-3
Residential Carcinogenic Screening of Vapor Intrusion for AOC 00-031(a)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Cancer Risk
Methylene chloride	0.041	0.598	7E-07
		Total Excess Cancer Risk	**7E-07**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-4
Residential Noncarcinogenic Screening Evaluation of Vapor Intrusion for AOC 00-031(a)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Hazard Quotients
Acetone	0.054	108	0.0005
Butanone[2-]	0.0062	1540	0.00004
Butylbenzene[sec-]	0.016	14500	0.000001
Carbon disulfide	0.00025	216	0.000001
Ethylbenzene	0.00085	319	0.000003
Isopropylbenzene	0.0035	127	0.00003
Isopropyltoluene[4-]	0.042	5.45	0.008
Naphthalene	0.11	3.7	0.03
Propylbenzene[1-]	0.00046	44.6	0.00001
Trichlorofluoromethane	0.00092	9.54	0.0001
Trimethylbenzene[1,2,4-]	0.15	1.9	0.08
Trimethylbenzene[1,3,5-]	0.23	0.382	0.6
Xylene	0.013	1.88	0.007
		HI	**0.7**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-5
Recreational Carcinogenic Screening for SWMU 01-001(b)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.13	10.5	1E-07
Methylene chloride	0.007	3300	2E-11
Total Excess Cancer Risk			**1E-07**

Note: SSL for methylene chloride is the risk-based value obtained from LANL and not the saturation limit presented and noted in Table 3.1-1.

*SSLs from LANL 2007, 094496.

Table G-4.2-6
Recreational Noncarcinogenic Screening for SWMU 01-001(b)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Hazard Quotients
Cadmium	1.94	392	0.005
Chromium	17.06	14300	0.001
Copper	6.43	31700	0.0002
Mercury	0.18	238	0.0007
Nickel	8.69	15800	0.0006
Nitrate	14.01	100000	0.0001
Selenium	0.25	3960	0.00006
Silver	0.12	3960	0.00003
Acetone	0.0028	100000	3E-08
Aroclor-1254	0.12	6.65	0.02
		HI	**0.03**

*SSLs from LANL 2007, 094496.

Table G-4.2-7
Recreational Radionuclide Screening for SWMU 01-001(b)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Total Dose (mrem/yr)
Plutonium-238	0.129	330	0.006
Plutonium-239/240	0.20	300	0.01
		Total Dose	**0.02**

*SALs from LANL 2005, 088493.

Table G-4.2-8
Residential Carcinogenic Screening for SWMU 01-001(b)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Chromium	24.36	2800[b]	9E-08
Aroclor-1254	0.026	2.2[b]	1E-07
Bis(2-ethylhexyl)phthalate	0.29	347	8E-09
Methylene chloride	0.0063	182	3E-10
Total Excess Cancer Risk			**2E-07**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-9
Residential Noncarcinogenic Screening for SWMU 01-001(b)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Cadmium	3.13	39	0.08
Copper	16.98	3130	5E-03
Nickel	9.46	1560	6E-03
Nitrate	8.68	100000	9E-05
Silver	7.01	391	0.02
Acetone	0.0047	28100	2E-07
Aroclor-1254	0.026	1.12	0.02
Bromomethane	0.00069	8.5	8E-05
Isopropyltoluene[4-]	0.00032	271[b]	1E-06
		HI	**0.1**

[a] SSLs from NMED 2006, 092513.

[b] SSL for isopropylbenzene used as a surrogate based on structural similarity.

Table G-4.2-10
Residential Radionuclide Screening for SWMU 01-001(b)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Total Dose (mrem/yr)
Cesium-137	0.054	2.4	0.34
Plutonium-238	0.13	37	0.05
Plutonium-239/240	0.20	33	0.09
Uranium-235/236	0.14	17	0.12
		Total Dose	**0.6**

*SALs from LANL 2005, 088493.

Table G-4.2-11
Residential Carcinogenic Screening of Vapor Intrusion for SWMU 01-001(b)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Cancer Risk
Methylene chloride	0.016	3.1	5E-08
Total Excess Cancer Risk			**5E-08**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-12
Residential Noncarcinogenic Screening Evaluation of Vapor Intrusion for SWMU 01-001(b)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Hazard Quotients
Acetone	0.0055	21.9	0.0003
Bromomethane	0.00069	1.59	0.0004
HI			**0.0007**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-13
Industrial Carcinogenic Screening for SWMU 01-001(c)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	Cancer Risk
Arsenic	1.7	17.7	1E-06
Chromium	4.4	14000[b]	3E-09
Total Excess Cancer Risk			**1E-06**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-14
Industrial Noncarcinogenic Screening Evaluation for SWMU 01-001(c)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Hazard Quotients
Aluminum	3730	100000	0.04
Barium	56.2	100000	6E-04
Beryllium	0.55	2250	2E-04
Cobalt	1.6	20500	8E-05
Copper	3.8	45400	8E-05
Lead	11.7	800	0.01
Nickel	2.8	22700	1E-04
Selenium	0.25	5680	4E-05
Thallium	0.13	74.9	2E-03
Vanadium	6.3	1140	6E-03
Di-n-butylphthalate	0.049	68400	7E-07
		HI	**0.06**

*SSL from NMED 2006, 092513.

Table G-4.2-15
Industrial Radionuclide Screening for SWMU 01-001(c)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Total Dose (mrem/yr)
Plutonium-239/240	5.5	210	0.4
		Total Dose	**0.4**

*SALs from LANL 2005, 088493.

Table G-4.2-16
Recreational Carcinogenic Screening for SWMU 01-001(c)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Arsenic	1.7	27.7	6E-07
		Total Excess Cancer Risk	**6E-07**

*SSLs from LANL 2007, 094496.

Table G-4.2-17
Recreational Noncarcinogenic Screening Evaluation for SWMU 01-001(c)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Hazard Quotients
Aluminum	3730	100000	0.04
Barium	56.2	100000	6E-04
Beryllium	0.55	1580	3E-04
Chromium	4.4	14300	3E-04
Cobalt	1.6	15700	1E-04
Copper	3.8	31700	1E-04
Lead	11.7	560	0.02
Nickel	2.8	15800	2E-04
Selenium	0.25	3960	6E-05
Thallium	0.13	52.3	2E-03
Vanadium	6.3	792	8E-03
Di-n-butylphthalate	0.049	39900	1E-06
		HI	**0.07**

*SSLs from LANL 2007, 094496.

Table G-4.2-18
Recreational Radionuclide Screening for SWMU 01-001(c)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Total Dose (mrem/yr)
Plutonium-239/240	5.5	300	0.3
		Total Dose	**0.3**

*SALs from LANL 2005, 088493.

Table G-4.2-19
Construction Worker Carcinogenic Screening for SWMU 01-001(c)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	Cancer Risk
Chromium	6.2	26.1[b]	2E-06
Aroclor-1260	0.031	7.4[c]	4E-08
		Total Excess Cancer Risk	**2E-06**

[a] SSLs from NMED 2006, 092513 unloess otherwise noted.

[b] SSL for hexavalent chromium from NMED 2006, 092513 used because a construction worker SSL is not available for total chromium.

[c] EPA industrial regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-20
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 01-001(c)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	Hazard Quotients
Aluminum	2484	14400	0.17
Antimony	0.19	124	0.002
Arsenic	1.37	85.2	0.02
Barium	38.83	60200	6E-04
Beryllium	0.6	56.2	0.01
Cobalt	1.21	1520	8E-04
Copper	3.93	12400	3E-04
Lead	9.42	800	0.01
Mercury	0.34	927[b]	4E-04
Nickel	3.76	6190	6E-04
Nitrate	0.40	100000	4E-06
Selenium	0.37	1550	2E-04
Thallium	0.17	20.4	0.008
Vanadium	5.97	310	0.02
Aroclor-1260	0.031	4.28	0.007
Di-n-butylphthalate	0.049	23300	2E-06
Trimethylbenzene[1,2,4-]	0.00043	190	2E-06
		HI	**0.3**

[a] SSL from NMED 2006, 092513.

[b] SSL for elemental mercury from NMED 2006, 092513 used because a construction worker SSL is not available for mercury inorganic salts.

Table G-4.2-21
Construction Worker Radionuclide Screening for SWMU 01-001(c)

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Total Dose (mrem/yr)
Plutonium-239/240	5.75	36	2.4
		Total Dose	**2.4**

* SALs from LANL 2005, 088493.

Table G-4.2-22
Residential Carcinogenic Screening for SWMU 01-001(c)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Arsenic	1.4	3.9	4E-06
Chromium	6.2	2800[b]	2E-08
Aroclor-1260	0.03	2.2[b]	1E-07
Total Excess Cancer Risk			**4E-06**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-23
Residential Noncarcinogenic Screening Evaluation for SWMU 01-001(c)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Aluminum	2484	77800	3E-02
Antimony	0.19	31.3	6E-03
Barium	38.83	15600	2E-03
Beryllium	0.61	156	4E-03
Cobalt	1.21	1520	8E-04
Copper	3.93	3130	1E-03
Lead	9.42	400	0.02
Mercury	0.34	23[b]	0.01
Nickel	3.76	1560	2E-03
Nitrate	0.40	100000	4E-06
Perchlorate	0.003	55[b]	5E-05
Selenium	0.37	391	9E-04
Thallium	0.17	5.16	0.03
Vanadium	5.97	78.2	0.08
Aroclor-1260	0.031	1.12	0.03
Di-n-butylphthalate	0.049	6110	8E-06
Trimethylbenzene[1,2,4-]	0.00043	58	7E-06
		HI	**0.2**

[a] SSL from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening levels for mercury inorganic salts and perchlorate (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-24
Residential Radionuclide Screening for SWMU 01-001(c)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Total Dose (mrem/yr)
Plutonium-239/240	5.75	33	2.6
		Total Dose	**2.6**

*SALs from LANL 2005, 088493.

Table G-4.2-25
Residential Noncarcinogenic Screening Evaluation of Vapor Intrusion for SWMU 01-001(c)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Hazard Quotients
Butylbenzene[tert-]	0.00015	44.6	0.000003
Isopropylbenzene	0.00014	123	0.000001
Trimethylbenzene[1,2,4-]	0.00043	1.9	0.0002
		HI	**0.0002**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-26
Residential Noncarcinogenic Screening Evaluation for SWMU 01-001(e)

COPC	EPC (mg/kg)	Residential SSL (mg/kg)	Hazard Quotients
Toluene	0.0004	5000*	8E-08
		HI	**8E-08**

Note: SSL for toluene is the risk-based value obtained from EPA and not the saturation limit presented and noted in Table 3.1-1.

* EPA regional risk-based screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-27
Residential Noncarcinogenic Screening Evaluation of Vapor Intrusion for SWMU 01-001(e)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Hazard Quotients
Toluene	0.0004	123	0.000003
		HI	**0.000003**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-28
Residential Carcinogenic Screening for SWMU 01-001(t)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Arsenic	1.71	3.9	4E-06
Chromium	21.4	2800[b]	8E-08
Methylene chloride	0.097	182	5E-10
		Total Excess Cancer Risk	**4E-06**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-29
Residential Noncarcinogenic Screening Evaluation for SWMU 01-001(t)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Barium	54.5	15600	4E-03
Copper	52.4	3130	0.02
Lead	17.2	400	0.04
Nickel	10.1	1560	6E-03
Nitrate	3.1	100000	3E-05
Selenium	0.32	391	8E-04
Acetone	0.0064	28100	2E-07
Benzyl alcohol	1.8	31000[b]	6E-05
		HI	**0.07**

[a] SSL from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-30
Residential Radionuclide Screening for SWMU 01-001(t)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Total Dose (mrem/yr)
Uranium-235/236	0.17	17	0.15
		Total Dose	**0.2**

* SALs from LANL 2005, 088493.

Table G-4.2-31
Residential Carcinogenic Screening of Vapor Intrusion for SWMU 01-001(t)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Cancer Risk
Methylene chloride	0.026	1.11	2E-07
Total Excess Cancer Risk			**2E-07**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-32
Residential Noncarcinogenic Screening Evaluation of Vapor Intrusion for SWMU 01-001(t)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Hazard Quotients
Acetone	0.0064	21.8	0.0003
HI			**0.0003**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-33
Residential Carcinogenic Screening for SWMU 01-001(u)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Bis(2-ethylhexyl)phthalate	0.062	347	2E-09
Methylene chloride	0.0054	182	3E-10
Total Excess Cancer Risk			**2E-09**

*SSLs from NMED 2006, 092513.

Table G-4.2-34
Residential Noncarcinogenic Screening Evaluation for SWMU 01-001(u)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Barium	97.08	15600	6E-03
Copper	8.1	3130	3E-03
Lead	27.28	400	0.07
Selenium	0.27	391	7E-04
Acetone	0.0061	28100	2E-07
Fluoranthene	0.048	2290	2E-05
Isopropyltoluene[4-]	0.0025	271[b]	9E-06
Pyrene	0.048	2290	2E-05
Toluene	0.00095	5000[c]	2E-07
Trichlorofluoromethane	0.0031	588	5E-06
		HI	**0.08**

Note: SSL for toluene is the risk-based value obtained from EPA and not the saturation limit presented and noted in Table 3.1-1.

[a] SSL from NMED 2006, 092513 unless otherwise noted.

[b] SSL for isopropylbenzene used as a surrogate based on structural similarity.

[c] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-35
Residential Carcinogenic Screening of Vapor Intrusion for SWMU 01-001(u)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Cancer Risk
Methylene chloride	0.0055	5.21	1E-08
		Total Excess Cancer Risk	**1E-08**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-36
Residential Noncarcinogenic Screening Evaluation of Vapor Intrusion for SWMU 01-001(u)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Hazard Quotients
Acetone	0.0061	31.9	0.0002
Isopropyltoluene[4-]	0.0025	106	0.00002
Toluene	0.00095	127	0.000007
Trichlorofluoromethane	0.0031	63.7	0.00005
		HI	**0.0003**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-37
Residential Carcinogenic Screening for SWMU 01-002

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Chromium	20.06	2800[b]	7E-08
Aroclor-1254	0.045	2.2[b]	2E-07
Aroclor-1260	0.0099	2.2[b]	5E-08
Benzene	0.0002	10.3	2E-10
Bis(2-ethylhexyl)phthalate	0.12	347	3E-09
Chloroform	0.00012	4	3E-10
Methylene chloride	0.0028	182	2E-10
Vinyl chloride	0.0017	2.25[c]	8E-09
Total Excess Cancer Risk			**3E-07**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

[c] Child SSL from NMED 2006, 092513.

Table G-4.2-38
Residential Noncarcinogenic Screening Evaluation for SWMU 01-002

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Antimony	0.077	31.3	2E-03
Beryllium	0.51	156	3E-03
Copper	3.08	3130	1E-03
Cyanide	0.21	1220	2E-04
Lead	13.4	400	0.03
Mercury	0.064	23[b]	3E-03
Nickel	8.38	1560	5E-03
Nitrate	5.60	100000	6E-05
Selenium	0.32	391	8E-04
Acetone	0.0046	28100	2E-07
Aroclor-1254	0.045	1.12	0.04
Aroclor-1260	0.0099	1.12	9E-03
Butylbenzene[n-]	0.00041	140[c]	3E-06
Butylbenzene[sec-]	0.00019	110[c]	2E-06
Isopropyltoluene[4-]	0.00023	271[d]	9E-07
Styrene	0.00041	6500[e]	6E-06
Toluene	0.00083	5000[e]	2E-07
Trichlorofluoromethane	0.00055	588	9E-07
Xylene (Total)	0.0051	600[e]	8E-05
		HI	**0.09**

Note: SSLs for butylbenzene[n-], butylbenzene[sec-], styrene, toluene, and xylene(total) are the risk-based values obtained from EPA and not the saturation limits presented and noted in Table 3.1-1.

[a] SSL from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level for mercury inorganic salts (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

[c] Risk-based SSL from EPA Region 6 (EPA 2007, 099314); not provided in the EPA regional table.

[d] SSL for isopropylbenzene used as a surrogate based on structural similarity.

[e] EPA regional risk-based screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-39
Residential Radionuclide Screening for SWMU 01-002

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Total Dose (mrem/yr)
Plutonium-238	0.11	37	0.05
Plutonium-239/240	0.16	33	0.07
Tritium	0.71	750	0.01
Uranium-235/236	0.14	17	0.12
		Total Dose	**0.3**

*SALs from LANL 2005, 088493.

Table G-4.2-40
Residential Carcinogenic Screening of Vapor Intrusion for SWMU 01-002

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Cancer Risk
Benzene	0.0002	0.0694	3E-08
Chloroform	0.00012	0.313	4E-09
Methylene chloride	0.0058	2.5	2E-08
Vinyl chloride	0.0017	0.818	2E-08
		Total Excess Cancer Risk	**7E-08**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-41
Residential Noncarcinogenic Screening Evaluation of Vapor Intrusion for SWMU 01-002

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Hazard Quotients
Acetone	0.0053	31.3	0.0002
Butylbenzene[n-]	0.00041	43.2	0.000009
Butylbenzene[sec-]	0.00019	14700	0.00000001
Butyllbenzene[tert-]	0.00015	43.2	0.000003
Isopropylbenzene	0.00012	62.7	0.000002
Isopropyltoluene[4-]	0.00023	123	0.000002
Styrene	0.00041	252	0.000002
Toluene	0.00055	16.7	0.00003
Trichlorofluoromethane	0.00055	216	0.000003
Xylene	0.0051	30.8	0.0002
		HI	**0.0005**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-42
Industrial Carcinogenic Screening for SWMU 01-003(e)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.14	8.26	2E-07
Aroclor-1260	0.058	8.26	7E-08
Benzo(a)anthracene	0.22	23.4	9E-08
Benzo(a)pyrene	0.22	2.34	9E-07
Benzo(b)fluoranthene	0.24	23.4	1E-07
Benzo(k)fluoranthene	0.22	234	9E-09
Bis(2-ethylhexyl)phthalate	0.52	1370	4E-09
Chloromethane	0.00071	53.4	1E-10
Chrysene	0.21	2310	9E-10
Dibenz(a,h)anthracene	0.047	2.34	2E-07
Indeno(1,2,3-cd)pyrene	0.12	23.4	5E-08
Methylene chloride	0.0035	490	7E-11
Tetrachloroethene	0.00016	31.6	5E-11
Total Excess Cancer Risk			**2E-06**

*SSLs from NMED 2006, 092513.

Table G-4.2-43
Industrial Noncarcinogenic Screening Evaluation for SWMU 01-003(e)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	Hazard Quotients
Beryllium	0.65	2250	3E-04
Lead	22.21	800	0.03
Mercury	0.056	310[b]	2E-04
Nickel	7.27	22700	3E-04
Nitrate	9.74	100000	1E-04
Zinc	33.26	100000	3E-04
Acenaphthene	0.075	33500	2E-06
Anthracene	0.11	100000	1E-06
Benzo(g,h,i)perylene	0.13	30900	4E-06
Butanone[2-]	0.0014	100000	7E-09
Butylbenzene[sec-]	0.0008	450[d]	2E-06
Dibenzofuran	0.046	1620	3E-05
Di-n-butylphthalate	0.045	68400	7E-07
Fluoranthene	0.23	24400	1E-05
Fluorene	0.079	26500	3E-06
Isopropyltoluene[4-]	0.00016	11000[c,d]	1E-08
Naphthalene	0.082	300	3E-04
Phenanthrene	0.2	20500	8E-06
Propylbenzene[1-]	0.00012	610[d]	2E-07
Pyrene	0.20	30900	6E-06
Styrene	0.00019	38000 [d]	5E-09
Toluene	0.00038	46000 [d]	8E-09
Trimethylbenzene[1,2,4-]	0.0004	213	2E-06
Trimethylbenzene[1,3,5-]	0.00012	200[d]	6E-07
		HI	**0.03**

Note: SSLs for butylbenzene[sec-], isopropyltoluene[4-], propylbenzene[1-], styrene, toluene, and trimethylbenzene[1,3,5-] are the risk-based values obtained from EPA and not the saturation limits presented and noted in Table 3.1-1.

[a] SSL from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level for mercury inorganic salts (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

[c] SSL for isopropylbenzene used as a surrogate based on structural similarity.

[d] EPA regional risk-based screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-44
Industrial Radionuclide Screening for SWMU 01-003(e)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Total Dose (mrem/yr)
Cesium-137	0.15	23	0.1
Plutonium-239/240	0.60	210	0.04
Tritium	0.64	4.4E+05	2E-05
		Total Dose	**0.1**

*SALs from LANL 2005, 088493.

Table G-4.2-45
Recreational Carcinogenic Screening for SWMU 01-003(e)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.14	10.5	1E-07
Aroclor-1260	0.058	10.5	6E-08
Benzo(a)anthracene	0.22	30.1	7E-08
Benzo(a)pyrene	0.22	3.01	7E-07
Benzo(b)fluoranthene	0.24	30.1	8E-08
Benzo(k)fluoranthene	0.22	301	7E-09
Bis(2-ethylhexyl)phthalate	0.52	1830	3E-09
Chloromethane	0.00071	510	1E-11
Chrysene	0.21	3010	7E-10
Dibenz(a,h)anthracene	0.047	3.01	2E-07
Indeno(1,2,3-cd)pyrene	0.12	30.1	4E-08
Methylene chloride	0.0035	3300	1E-11
Tetrachloroethene	0.00016	134	1E-11
		Total Excess Cancer Risk	**1E-06**

Note: SSL for methylene chloride is the risk-based value obtained from LANL and not the saturation limit presented and noted in Table 3.1-1.

*SSLs from LANL 2007, 094496.

Table G-4.2-46
Recreational Noncarcinogenic Screening Evaluation for SWMU 01-003(e)

COPC	EPC (mg/kg)	Recreational SSL[a] (mg/kg)	Hazard Quotients
Beryllium	0.65	1580	4E-04
Lead	22.21	560	0.04
Mercury	0.056	238	2E-04
Nickel	7.27	15800	5E-04
Nitrate	9.74	100000	1E-04
Zinc	33.26	100000	3E-04
Acenaphthene	0.075	47500	2E-06
Anthracene	0.11	100000	1E-06
Benzo(g,h,i)perylene	0.13	23800	5E-06
Butanone[2-]	0.0014	100000	3E-09
Butylbenzene[sec-]	0.0008	2930	3E-07
Dibenzofuran	0.046	1580	3E-05
Di-n-butylphthalate	0.045	39900	1E-06
Fluoranthene	0.23	13900	2E-05
Fluorene	0.079	31700	2E-06
Isopropyltoluene[4-]	0.00016	7800[b]	2E-08
Naphthalene	0.082	15800	5E-06
Phenanthrene	0.17	12000	1E-05
Propylbenzene[1-]	0.00012	3470	3E-08
Pyrene	0.20	23800	8E-06
Styrene	0.00019	64300	3E-09
Toluene	0.00038	54100	7E-09
Trimethylbenzene[1,2,4-]	0.0004	1520	3E-07
Trimethylbenzene[1,3,5-]	0.00012	762	2E-07
		HI	**0.04**

Note: SSLs for butylbenzene[sec-], propylbenzene[1-], styrene, toluene, and trimethylbenzene[1,3,5-] are the risk-based values obtained from LANL and not the saturation limits presented and noted in Table 3.1-1.

[a] SSLs from LANL 2007, 094496.

[b] SSL for isopropylbenzene used as a surrogate based on structural similarity.

Table G-4.2-47
Recreational Radionuclide Screening for SWMU 01-003(e)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Total Dose (mrem/yr)
Cesium-137	0.15	210	0.01
Plutonium-239/240	0.60	300	0.03
Tritium	0.64	5.1E+06	2E-08
		Total Dose	**0.04**

*SALs from LANL 2005, 088493.

Table G-4.2-48
Residential Carcinogenic Screening for SWMU 01-003(e)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Aroclor-1254	0.14	2.2[b]	6E-07
Aroclor-1260	0.052	2.2[b]	2E-07
Benzo(a)anthracene	0.22	6.21	3E-07
Benzo(a)pyrene	0.22	0.621	3E-06
Benzo(b)fluoranthene	0.24	6.21	4E-07
Benzo(k)fluoranthene	0.22	62.1	3E-08
Bis(2-ethylhexyl)phthalate	0.52	347	2E-08
Chloromethane	0.00071	21.8	3E-10
Chrysene	0.21	615	3E-09
Dibenz(a,h)anthracene	0.047	0.621	8E-07
Indeno(1,2,3-cd)pyrene	0.12	6.21	2E-07
Methylene chloride	0.0034	182	2E-10
Tetrachloroethene	0.00016	12.5	1E-10
		Total Excess Cancer Risk	**6E-06**

[a] SSL from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-49
Residential Noncarcinogenic Screening Evaluation for SWMU 01-003(e)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Beryllium	1.09	156	0.007
Lead	20.97	400	0.05
Mercury	0.059	23[b]	3E-03
Nickel	7.13	1560	5E-03
Nitrate	7.11	100000	7E-05
Selenium	0.44	391	1E-03
Zinc	37.77	23500	2E-03
Acenaphthene	0.075	3730	2E-05
Anthracene	0.11	22000	5E-06
Aroclor-1254	0.14	1.12	0.13
Aroclor-1260	0.052	1.12	0.05
Benzo(g,h,i)perylene	0.13	2290	6E-05
Butanone[2-]	0.0014	31800	4E-08
Butylbenzene[sec-]	0.0008	110[c]	7E-06
Dibenzofuran	0.046	142	3E-04
Di-n-butylphthalate	0.045	6110	8E-06
Fluoranthene	0.19	2290	8E-05
Fluorene	0.079	2660	3E-05
Isopropyltoluene[4-]	0.00016	271[d]	6E-07
Naphthalene	0.082	79.5	1E-03
Phenanthrene	0.17	1830	9E-05
Propylbenzene[1-]	0.00012	140[c]	9E-07
Pyrene	0.18	2290	8E-05
Styrene	0.00019	6500[e]	3E-08
Toluene	0.00038	5000[e]	8E-08
Trimethylbenzene[1,2,4-]	0.0004	58	7E-06
Trimethylbenzene[1,3,5-]	0.00012	24.8	5E-06
		HI	**0.2**

Note: SSLs for butylbenzene[sec-], propylbenzene[1-], styrene, and toluene are the risk-based values obtained from EPA and not the saturation limits presented and noted in Table 3.1-1.

[a] SSL from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level for mercury inorganic salts (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

[c] Risk-based SSL from EPA Region 6 (EPA 2007, 099314); not provided in the EPA regional table.

[d] SSL for isopropylbenzene used as a surrogate based on structural similarity.

[e] EPA regional risk-based screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-50
Residential Radionuclide Screening for SWMU 01-003(e)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Total Dose (mrem/yr)
Cesium-137	0.14	5.6	0.37
Plutonium-239/240	0.70	33	0.32
Tritium	0.64	750	0.01
		Total Dose	**0.7**

*SALs from LANL 2005, 088493.

Table G-4.2-51
Industrial Noncarcinogenic Screening Evaluation for SWMU 01-006(d)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Hazard Quotients
Mercury	0.12	310	4E-04
Fluoranthene	0.05	24400	2E-06
Pyrene	0.05	30900	2E-06
		HI	**4E-04**

*SSL from NMED 2006, 092513.

Table G-4.2-52
Recreational Noncarcinogenic Screening Evaluation for SWMU 01-006(d)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Hazard Quotients
Mercury	0.12	238	5E-04
Fluoranthene	0.05	13900	4E-06
Pyrene	0.05	23800	2E-06
		HI	**5E-04**

*SSL from NMED 2006, 092513.

Table G-4.2-53
Construction Worker Noncarcinogenic Screening Evaluation for SWMU 01-006(d)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Hazard Quotients
Mercury	0.12	927	1E-04
Fluoranthene	0.05	8730	6E-06
Pyrene	0.05	9010	6E-06
		HI	**1E-04**

*SSL from NMED 2006, 092513.

Table G-4.2-54
Residential Noncarcinogenic Screening Evaluation for SWMU 01-006(d)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Hazard Quotients
Mercury	0.12	23	5E-03
Fluoranthene	0.053	2290	2E-05
Pyrene	0.053	2290	2E-05
		HI	**5E-03**

*SSL from NMED 2006, 092513.

Table G-4.2-55
Recreational Carcinogenic Screening for AOC 01-006(g)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Arsenic	5.20	27.7	2E-06
Aroclor-1260	0.02	10.5	2E-08
Bis(2-ethylhexyl)phthalate	0.056	1830	3E-10
Methylene chloride	0.029	3300	1E-10
		Total Excess Cancer Risk	**2E-06**

Note: SSL for methylene chloride is the risk-based value obtained from LANL and not the saturation limit presented and noted in Table 3.1-1.
*SSLs from LANL 2007, 094496.

Table G-4.2-56
Recreational Noncarcinogenic Screening Evaluation for AOC 01-006(g)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Hazard Quotients
Barium	47.73	100000	5E-04
Chromium	9.18	14300	6E-04
Copper	11.72	31700	4E-04
Nickel	4	15800	3E-04
Nitrate	30.3	100000	3E-04
Perchlorate	0.0028	79.2	4E-05
Trimethylbenzene[1,2,4-]	0.00031	1520	2E-07
		HI	**0.002**

*SSLs from LANL 2007, 094496.

Table G-4.2-57
Recreational Radionuclide Screening for AOC 01-006(g)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Total Dose (mrem/yr)
Plutonium-239/240	1.7	300	0.08
		Total Dose	**0.08**

*SALs from LANL 2005, 088493.

Table G-4.2-58
Residential Carcinogenic Screening for AOC 01-006(g)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Arsenic	3.77	3.9	1E-05
Chromium	14.32	2800[b]	5E-08
Aroclor-1260	0.017	2.2[b]	8E-08
Bis(2-ethylhexyl)phthalate	0.056	347	2E-09
Methylene chloride	0.028	182	2E-09
		Total Excess Cancer Risk	**1E-05**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-59
Residential Noncarcinogenic Screening Evaluation for AOC 01-006(g)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Barium	46.8	15600	3E-03
Copper	7.2	3130	2E-03
Nickel	8.2	1560	5E-03
Nitrate	19.0	100000	2E-04
Perchlorate	0.012	55[b]	2E-04
Aroclor-1260	0.017	1.12	0.02
Trimethylbenzene[1,2,4-]	0.00032	58	6E-06
		HI	**0.03**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-60
Residential Radionuclide Screening for AOC 01-006(g)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Total Dose (mrem/yr)
Plutonium-239/240	1.1	33	0.5
		Total Dose	**0.5**

*SALs from LANL 2005, 088493.

Table G-4.2-61
Residential Carcinogenic Screening of Vapor Intrusion for AOC 01-006(g)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Cancer Risk
Methylene chloride	0.029	3.89	7E-08
		Total Excess Cancer Risk	**7E-08**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-62
Residential Noncarcinogenic Screening Evaluation of Vapor Intrusion for AOC 01-006(g)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Hazard Quotients
Trimethylbenzene[1,2,4-]	0.00032	0.569	0.0006
		HI	**0.0006**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-63
Residential Carcinogenic Screening for AOC 01-006(o)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Aroclor-1254	0.27	2.2[b]	1E-06
Aroclor-1260	0.032	2.2[b]	2E-07
Benzo(a)anthracene	0.051	6.21	8E-08
Benzo(a)pyrene	0.053	0.621	8E-07
Benzo(b)fluoranthene	0.062	6.21	1E-07
Benzo(k)fluoranthene	0.48	62.1	8E-09
Bis(2-ethylhexyl)phthalate	0.24	347	7E-09
Chrysene	0.061	615	1E-09
		Total Excess Cancer Risk	**2E-06**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-64
Residential Noncarcinogenic Screening Evaluation for AOC 01-006(o)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Nitrate	0.28	100000	3E-06
Aroclor-1254	0.27	1.12	0.24
Aroclor-1260	0.032	1.12	0.03
Benzyl alcohol	0.042	31000[b]	1E-06
Fluoranthene	0.13	2290	6E-05
Phenanthrene	0.066	1830	4E-05
Pyrene	0.11	2290	5E-05
		HI	**0.3**

[a] SSL from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-65
Residential Radionuclide Screening for AOC 01-006(o)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Total Dose (mrem/yr)
Plutonium-239/240	0.28	33	0.13
Strontium-90	0.39	5.7	1.03
Tritium	1.42	750	0.03
		Total Dose	**1.2**

*SALs from LANL 2005, 088493.

Table G-4.2-66
Residential Carcinogenic Screening for SWMU 01-007(d)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Chromium	57.1	2800[b]	2E-07
Aroclor-1260	0.025	2.2[b]	1E-07
Methylene chloride	0.0044	182	2E-10
		Total Excess Cancer Risk	**3E-07**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-67
Residential Noncarcinogenic Screening Evaluation for SWMU 01-007(d)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Lead	18.45	400	0.05
Nickel	27.61	1560	0.02
Nitrate	0.48	100000	5E-06
Selenium	0.42	391	0.001
Aroclor-1260	0.025	1.12	0.02
Di-n-octylphthalate	0.43	6110[b]	7E-05
Trimethylbenzene[1,2,4-]	0.00057	58	1E-05
		HI	**0.09**

[a] SSL from NMED 2006, 092513 unless otherwise noted.

[b] SSL for di-n-butylphthalate used as a surrogate based on structural similarity.

Table G-4.2-68
Residential Carcinogenic Screening of Vapor Intrusion for SWMU 01-007(d)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Cancer Risk
Methylene chloride	0.0046	1.94	2E-08
		Total Excess Cancer Risk	**2E-08**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-69
Residential Noncarcinogenic Screening Evaluation of Vapor Intrusion for SWMU 01-007(d)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Hazard Quotients
Trimethylbenzene[1,2,4-]	0.00057	0.342	0.002
		HI	**0.002**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-70
Residential Carcinogenic Screening for SWMU 01-007(e)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Aroclor-1254	0.28	2.2[b]	1E-06
Benzo(a)anthracene	1.6	6.21	3E-06
Benzo(a)pyrene	0.88	0.621	1E-05
Benzo(b)fluoranthene	2	6.21	3E-06
Benzo(k)fluoranthene	1.8	62.1	3E-07
Chrysene	3	615	5E-08
Ethylbenzene	0.0001	57[b]	2E-11
Indeno(1,2,3-cd)pyrene	0.78	6.21	1E-06
		Total Excess Cancer Risk	**2E-05**

Note: SSL for ethylbenzene is the risk-based value obtained from EPA and not the saturation limit presented and noted in Table 3.1-1.

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-71
Residential Noncarcinogenic Screening Evaluation for SWMU 01-007(e)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Barium	53.5	15600	3E-03
Copper	12.40	3130	4E-03
Nickel	7.30	1560	5E-03
Nitrate	1.10	100000	1E-05
Selenium	0.33	391	8E-04
Silver	3.10	391	0.01
Anthracene	0.079	22000	4E-06
Aroclor-1254	0.28	1.12	0.25
Benzo(g,h,i)perylene	0.89	2290[b]	4E-04
Fluoranthene	1.5	2290	7E-04
Phenanthrene	0.21	1830	1E-04
Pyrene	1.60	2290	7E-04
Trichlorofluoromethane	2.80E-04	588	5E-07
		HI	**0.3**

[a] SSL from NMED 2006, 092513 unless otherwise noted.

[b] SSL for pyrene used as a surrogate based on structural similarity.

Table G-4.2-72
Residential Noncarcinogenic Screening Evaluation of Vapor Intrusion for SWMU 01-007(e)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Hazard Quotients
Ethylbenzene	0.0001	212	0.0000005
Trichlorofluoromethane	0.00028	149	0.000002
		HI	**0.000003**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-73
Residential Carcinogenic Screening for SWMU 01-007(j)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Aroclor-1254	0.67	2.2[b]	3E-06
Bis(2-ethylhexyl)phthalate	0.085	347	2E-09
		Total Excess Cancer Risk	**3E-06**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-74
Residential Noncarcinogenic Screening Evaluation for SWMU 01-007(j)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Hazard Quotients
Aroclor-1254	0.67	1.12	0.60
Di-n-butylphthalate	0.05	6110	8E-06
		HI	**0.6**

*SSLs from NMED 2006, 092513.

Table G-4.2-75
Residential Carcinogenic Screening for AOC 01-007(k)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Chromium	20.14	2800[b]	7E-08
Methylene chloride	0.02	182	1E-09
		Total Excess Cancer Risk	**7E-08**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-76
Residential Noncarcinogenic Screening Evaluation for AOC 01-007(k)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Hazard Quotients
Aluminum	7751	77800	0.1
Barium	46.4	15600	3E-03
Copper	159	3130	0.05
Nickel	9.7	1560	0.01
Nitrate	3.1	100000	3E-05
Selenium	0.36	391	9E-04
Acetone	0.0064	28100	2E-07
		HI	**0.2**

*SSLs from NMED 2006, 092513.

Table G-4.2-77
Residential Radionuclide Screening for AOC 01-007(k)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Total Dose (mrem/yr)
Uranium-235/236	0.18	17	0.16
		Total Dose	**0.2**

*SALs from LANL 2005, 088493.

Table G-4.2-78
Residential Carcinogenic Screening of Vapor Intrusion for AOC 01-007(k)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Cancer Risk
Methylene chloride	0.026	3.89	7E-08
		Total Excess Cancer Risk	**7E-08**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-79
Residential Noncarcinogenic Screening Evaluation of Vapor Intrusion for AOC 01-007(k)

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Hazard Quotients
Acetone	0.0064	108	0.00006
		HI	**0.00006**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-80
Industrial Carcinogenic Screening for SWMU 03-009(j)

COPC	EPC (mg/kg)	Industrial SSL (mg/kg)	Cancer Risk
Chromium	15.1	14000*	1E-08
		Total Excess Cancer Risk	**1E-08**

*EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-81
Industrial Noncarcinogenic Screening Evaluation for SWMU 03-009(j)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Hazard Quotients
Aluminum	11263	100000	0.11
Cyanide	0.16	13700	1E-05
Lead	15.7	800	0.02
Nickel	10.7	22700	5E-04
Nitrate	0.2	100000	2E-06
		HI	**0.1**

*SSLs from NMED 2006, 092513.

Table G-4.2-82
Recreational Noncarcinogenic Screening Evaluation for SWMU 03-009(j)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Hazard Quotients
Aluminum	11263	100000	0.11
Chromium	15.1	14300	0.001
Cyanide	0.16	7970	2E-05
Lead	15.7	560	0.02
Nickel	10.7	15800	5E-04
Nitrate	0.2	100000	2E-06
		HI	**0.1**

*SSLs from LANL 2007, 094496.

Table G-4.2-83
Residential Carcinogenic Screening for SWMU 03-009(j)

COPC	EPC (mg/kg)	Residential SSL (mg/kg)	Cancer Risk
Chromium	15.1	2800*	5E-08
		Total Excess Cancer Risk	**5E-08**

*EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-84
Residential Noncarcinogenic Screening Evaluation for SWMU 03-009(j)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Hazard Quotients
Aluminum	11263	77800	0.14
Cyanide	0.16	1220	1E-04
Lead	15.7	400	0.04
Nickel	10.7	1560	7E-03
Nitrate	0.2	100000	2E-06
		HI	**0.2**

*SSLs from NMED 2006, 092513.

Table G-4.2-85
Dioxin/Furan Calculation for SWMU 32-001 for the Industrial Scenario

COPC	EPC (mg/kg) 0-1 ft	Toxic Equivalency Factor (TEF)*	Calculation
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	9.48E-06	0.001	9.48E-09
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	7.44E-07	0.1	7.44E-08
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.13E-07	0.1	4.13E-08
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	9.64E-05	0.0003	2.89E-08
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	1.32E-05	0.01	1.32E-07
Hexachlorodibenzofuran[1,2,3,4,7,8-]	8.63E-07	0.1	8.63E-08
Hexachlorodibenzofuran[1,2,3,6,7,8-]	1.04E-06	0.1	1.04E-07
Hexachlorodibenzofuran[2,3,4,6,7,8-]	1.59E-06	0.1	1.59E-07
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	1.76E-05	0.0003	5.28E-09
Pentachlorodibenzofuran[1,2,3,7,8-]	1.52E-07	0.03	4.56E-09
Pentachlorodibenzofuran[2,3,4,7,8-]	3.25E-06	0.3	9.75E-07
		2,3,7,8-TCDD Sum	**1.6E-06**

*TEFs from www.who.int/ipcs/assessment/tef_update/en/print.html.

Table G-4.2-86
Industrial Carcinogenic Screening for SWMU 32-001

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	Cancer Risk
Chromium	7.8	14000[b]	6E-09
Aroclor-1260	0.07	8.26	8E-08
Methylene chloride	0.005	490	1E-10
Trichloroethene	0.009	253	3E-10
TCDD[2,3,7,8-] equivalent	1.6E-06	2.04E-04	8E-08
		Total Excess Cancer Risk	**2E-07**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-87
Industrial Noncarcinogenic Screening Evaluation for SWMU 32-001

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	Hazard Quotients
Barium	155	100000	2E-03
Cobalt	12.4	20500	6E-04
Copper	16.5	45400	4E-04
Mercury	0.41	310[b]	1E-03
Nickel	9.9	22700	4E-04
Nitrate	3.80	100000	4E-05
Selenium	0.31	5680	5E-05
Silver	0.09	5680	2E-05
Zinc	79.3	100000	8E-04
Dichloroethene[cis-1,2-]	0.01	11400	9E-07
		HI	**0.005**

[a] SSL from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level for mercury inorganic salts. (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-88
Dioxin/Furan Calculation for
SWMU 32-001 for the Construction Worker and Residential Scenarios

COPC	EPC (mg/kg) 0–1 ft	Toxic Equivalency Factor (TEF)*	Calculation
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	4.38E-06	0.001	4.38E-09
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	3.16E-07	0.1	3.16E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	7.44E-07	0.1	7.44E-08
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	5.51E-07	0.1	5.51E-08
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	7.37E-05	0.0003	2.21E-08
Pentachlorodibenzodioxin[1,2,3,7,8-]	2.33E-07	1	2.33E-07
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	1.32E-05	0.01	1.32E-07
Hexachlorodibenzofuran[1,2,3,4,7,8-]	5.57E-07	0.01	5.57E-09
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	8.63E-07	0.1	8.63E-08
Hexachlorodibenzofuran[1,2,3,6,7,8-]	1.04E-06	0.1	1.04E-07
Hexachlorodibenzofuran[2,3,4,6,7,8-]	1.59E-06	0.1	7.80E-07
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	7.80E-06	0.0003	2.34E-09
Pentachlorodibenzofuran[1,2,3,7,8-]	2.25E-07	0.03	6.75E-09
Pentachlorodibenzofuran[2,3,4,7,8-]	3.25E-06	0.3	9.75E-07
		2,3,7,8-TCDD Sum	**2.5E-06**

*TEFs from www.who.int/ipcs/assessment/tef_update/en/print.html.

Table G-4.2-89
Construction Worker Carcinogenic Screening for SWMU 32-001

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	Cancer Risk
Chromium	13.55	26.1[b]	5E-06
Bis(2-ethylhexyl)phthalate	0.16	4660	3E-10
Methylene chloride	0.0059	490[c]	1E-10
Tetrachloroethene	0.00022	31.6[c]	7E-11
Trichloroethene	0.009	33.6	3E-09
TCDD[2,3,7,8-] equivalent	2.5E-06	2.84E-04	9E-08
		Total Excess Cancer Risk	**5E-06**

[a] SSLs from NMED 2006, 092513.

[b] SSL for hexavalent chromium from NMED 2006, 092513 used because a construction worker SSL is not available for total chromium.

[c] Industrial SSLs for methylene chloride and tetrachloroethene from NMED 2006, 092513 used because risk-based construction worker SSLs are not available.

Table G-4.2-90
Construction Worker Noncarcinogenic Screening Evaluation for SWMU 32-001

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	Hazard Quotients
Barium	138.40	60200	2E-03
Cobalt	5.44	61	0.09
Copper	9.14	12400	7E-04
Cyanide	0.093	4760	2E-05
Mercury	0.15	927[b]	2E-04
Nickel	9.21	6190	2E-03
Nitrate	11.14	100000	1E-04
Perchlorate	0.0036	790[c]	2E-05
Selenium	0.31	1550	2E-04
Silver	0.084	1550	5E-05
Zinc	43.46	92900	5E-04
Acetone	0.0062	98500	6E-08
Aroclor-1260	0.01	4.28	2E-03
Dichloroethene[cis-1,2-]	0.01	254	4E-05
Phenanthrene	0.044	6990	6E-06
		HI	**0.1**

[a] SSL from NMED 2006, 092513 unless otherwise noted.

[b] SSL for elemental mercury from NMED 2006, 092513 used because a construction worker SSL for mercury inorganic salts is not available.

[c] SSL for outdoor worker from EPA regional screening table (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm) used because a construction worker SSL is not available.

Table G-4.2-91
Construction Worker Radionuclide Screening for SWMU 32-001

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Total Dose (mrem/yr)
Plutonium-239/240	0.047	36	0.02
Strontium-90	0.27	800	0.005
		Total Dose	**0.03**

*SALs from LANL 2005, 088493.

Table G-4.2-92
Residential Carcinogenic Screening for SWMU 32-001

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Aroclor-1260	0.01	2.2	3E-08
Chromium	13.55	2800[b]	5E-08
Bis(2-ethylhexyl)phthalate	0.16	347	5E-09
Methylene chloride	0.0059	182	3E-10
Tetrachloroethene	0.0022	12.5	2E-09
Trichloroethene	0.009	0.638	1E-07
TCDD[2,3,7,8-] equivalent	2.5E-06	4.14E-05	6E-07
		Total Excess Cancer Risk	**8E-07**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-93
Residential Noncarcinogenic Screening Evaluation for SWMU 32-001

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Barium	138.40	15600	9E-03
Cobalt	5.44	1520	4E-03
Copper	9.14	3130	3E-03
Cyanide	0.093	1220	8E-05
Mercury	0.15	23[b]	6E-03
Nickel	9.21	1560	6E-03
Nitrate	11.14	100000	1E-04
Perchlorate	0.0036	55[b]	7E-05
Selenium	0.31	391	8E-04
Silver	0.084	391	2E-04
Zinc	43.46	23500	2E-03
Acetone	0.0062	28100	2E-07
Aroclor-1260	0.01	1.12	9E-03
Dichloroethene[cis-1,2-]	0.01	76.5	1E-04
Phenanthrene	0.044	1830	2E-05
		HI	**0.04**

[a] SSL from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening levels for mercury inorganic salts and perchlorate (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-94
Residential Radionuclide Screening for SWMU 32-001

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Total Dose (mrem/yr)
Plutonium-239/240	0.047	33	0.02
Strontium-90	0.27	5.7	0.72
		Total Dose	**0.7**

*SALs from LANL 2005, 088493.

Table G-4.2-95
Residential Carcinogenic Screening of Vapor Intrusion for SWMU 32-001

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Cancer Risk
Methylene chloride	0.0063	3.73	2E-08
Tetrachloroethene	0.00022	1.26	2E-09
Trichloroethene	0.009	0.0934	1E-06
Total Excess Cancer Risk			**1E-06**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-96
Residential Noncarcinogenic Screening Evaluation of Vapor Intrusion for SWMU 32-001

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Hazard Quotients
Acetone	0.0065	108	0.00006
Dichloroethen[cis-1,2-]	0.01	15.4	0.0006
HI			**0.0006**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-97
Industrial Carcinogenic Screening for AOC 32-004

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	Cancer Risk
Chromium	17.71	14000[b]	1E-08
Benzo(a)anthracene	3.67	23.4	2E-06
Benzo(a)pyrene	3.84	2.34	2E-05
Benzo(b)fluoranthene	3.24	23.4	1E-06
Benzo(k)fluoranthene	3.47	234	2E-07
Bis(2-ethylhexyl)phthalate	0.84	1370	6E-09
Butylbenzylphthalate	3.48	9100	4E-09
Chrysene	5.79	2310	2E-08
Indeno(1,2,3-cd)pyrene	2.08	23.4	9E-07
Total Excess Cancer Risk			**2E-05**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-98
Industrial Noncarcinogenic Screening Evaluation for AOC 32-004

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	Hazard Quotients
Copper	13.61	45400	3E-04
Lead	104.3	800	0.13
Mercury	0.32	310[b]	1E-03
Nickel	5.51	22700	2E-04
Silver	3.3	5680	6E-04
Zinc	94.76	100000	1E-03
Acenaphthene	0.19	33500	6E-06
Acetone	0.002	100000	2E-08
Anthracene	0.76	100000	8E-06
Benzo(g,h,i)perylene	2.15	30900[c]	7E-05
Di-n-octylphthalate	0.097	24400[d]	4E-06
Fluoranthene	11.75	24400	5E-04
Fluorene	0.19	26500	7E-06
Naphthalene	0.23	300	8E-04
Phenanthrene	4.37	20500	2E-04
Pyrene	9.81	30900	3E-04
		HI	**0.1**

[a] SSL from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level for mercury inorganic salts (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

[c] SSL for pyrene used as a surrogate for benzo(g,h,i)perylene based on structural similarity.

[d] SSL for di-n-butylphthalate used as a surrogate for di-n-octylphthalate based on structural similarity.

Table G-4.2-99
Industrial Radionuclide Screening for AOC 32-004

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Total Dose (mrem/yr)
Americium-241	0.091	180	0.01
		Total Dose	**0.01**

*SALs from LANL 2005, 088493.

Table G-4.2-100
Construction Worker Carcinogenic Screening for AOC 32-004

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	Cancer Risk
Chromium	24.59	26.1[b]	9E-06
Benzo(a)anthracene	2.4	212	1E-07
Benzo(a)pyrene	2.71	21.2	1E-06
Benzo(b)fluoranthene	2.84	212	1E-06
Benzo(k)fluoranthene	2.34	2120	1E-07
Bis(2-ethylhexyl)phthalate	0.66	4660	1E-09
Butylbenzylphthalate	2.67	9100[c]	3E-09
Chrysene	4.1	21200	2E-09
Indeno(1,2,3-cd)pyrene	1.45	212	7E-08
Total Excess Cancer Risk			**1E-05**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] SSL for hexavalent chromium from NMED 2006, 092513 used because a construction worker SSL for total chromium is not available.

[c] Industrial SSL from EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm) used because a construction worker SSL is not available.

Table G-4.2-101
Construction Worker Noncarcinogenic Screening Evaluation for AOC 32-004

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	Hazard Quotients
Copper	12.15	12400	1E-03
Lead	79.4	800	0.10
Mercury	0.27	310[b]	9E-04
Nickel	10.77	6190	2E-03
Nitrate	0.26	100000	3E-06
Selenium	0.28	1550	2E-04
Silver	1.63	1550	1E-03
Zinc	85.4	92900	9E-04
Acenaphthene	0.19	14100	1E-05
Acetone	0.002	98500	2E-08
Anthracene	0.6	86000	8E-06
Benzo(g,h,i)perylene	1.5	9010[c]	2E-04
Di-n-octylphthalate	0.097	23300[d]	4E-06
Fluoranthene	5.3	8730	6E-04
Fluorene	0.19	10200	2E-05
Naphthalene	0.23	262	9E-04
Phenanthrene	3.2	6990	4E-04
Pyrene	4.5	9010	5E-04
		HI	**0.1**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] SSL for elemental mercury from NMED 2006, 092513 used because a construction worker SSL for mercury inorganic salts is not available.

[c] SSL for pyrene used as a surrogate for benzo(g,h,i)perylene based on structural similarity.

[d] SSL for di-n-butylphthalate used as a surrogate for di-n-octylphthalate based on structural similarity.

Table G-4.2-102
Construction Worker Radionuclide Screening for AOC 32-004

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Total Dose (mrem/yr)
Americium-241	0.091	34	0.04
		Total Dose	**0.04**

*SALs from LANL 2005, 088493.

Table G-4.2-103
Residential Carcinogenic Screening for AOC 32-004

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Chromium	24.59	2800[b]	9E-08
Benzo(a)anthracene	2.4	6.21	4E-06
Benzo(a)pyrene	2.71	0.621	4E-05
Benzo(b)fluoranthene	2.84	6.21	5E-06
Benzo(k)fluoranthene	2.34	62.1	4E-07
Bis(2-ethylhexyl)phthalate	0.66	347	2E-08
Butylbenzylphthalate	2.67	2600	1E-08
Chrysene	4.1	615	7E-08
Indeno(1,2,3-cd)pyrene	1.45	6.21	2E-06
Total Excess Cancer Risk			**5E-05**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-104
Residential Noncarcinogenic Screening Evaluation for AOC 32-004

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Copper	12.15	3130	4E-03
Lead	79.4	400	0.20
Mercury	0.27	23[b]	0.01
Nickel	10.77	1560	7E-03
Nitrate	0.26	100000	3E-06
Selenium	0.28	391	7E-04
Silver	1.63	391	4E-03
Zinc	85.4	23500	4E-04
Acenaphthene	0.19	3730	5E-05
Acetone	0.002	28100	7E-08
Anthracene	0.6	22000	3E-05
Benzo(g,h,i)perylene	1.5	2290[c]	6E-04
Di-n-octylphthalate	0.097	6110[d]	2E-05
Fluoranthene	5.3	2290	2E-03
Fluorene	0.19	2660	7E-05
Naphthalene	0.23	79.5	3E-03
Phenanthrene	3.2	1830	2E-03
Pyrene	4.5	2290	2E-03
		HI	**0.2**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

[c] SSL for pyrene used as a surrogate for benzo(g,h,i)perylene based on structural similarity.

[d] SSL for di-n-butylphthalate used as a surrogate for di-n-octylphthalate based on structural similarity.

Table G-4.2-105
Residential Radionuclide Screening for AOC 32-004

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Total Dose (mrem/yr)
Americium-241	0.091	30	0.05
		Total Dose	**0.05**

*SALs from LANL 2005, 088493.

Table G-4.2-106
Residential Noncarcinogenic Screening Evaluation of Vapor Intrusion for AOC 32-004

COPC	EPC[a] (mg/kg)	Vapor Intrusion Risk-Based Concentration[b] (mg/kg)	Hazard Quotients
Acetone	0.002	253	0.000008
		HI	**0.000008**

[a] Maximum detected concentration.

[b] Vapor intrusion risk values generated by the Johnson and Ettinger advanced soil model.

Table G-4.2-107
Industrial Carcinogenic Screening for SWMU 41-001

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	Cancer Risk
Arsenic	1.2	17.7	7E-07
Chromium	2.4	14000[b]	2E-09
Benzo(b)fluoranthene	0.045	23.4	2E-08
Benzo(k)fluoranthene	0.037	234	2E-09
Chrysene	0.046	2310	2E-10
Indeno(1,2,3-cd)pyrene	0.36	23.4	2E-07
		Total Excess Cancer Risk	**9E-07**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-108
Industrial Noncarcinogenic Screening Evaluation for SWMU 41-001

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	Hazard Quotients
Aluminum	2460	100000	0.02
Barium	40.5	100000	4E-04
Copper	4	45400	9E-05
Iron	4340	100000	0.04
Lead	13.8	800	0.02
Manganese	199	48400	4E-03
Nickel	2.1	22700	9E-05
Nitrate	7.2	100000	7E-05
Perchlorate	0.0098	790[b]	1E-05
Vanadium	6.1	1140	5E-03
Zinc	33.4	100000	3E-04
Di-n-butylphthalate	0.13	68400	2E-06
Fluoranthene	0.055	24400	2E-06
Pyrene	0.051	30900	2E-06
Toluene	0.011	5000[b]	2E-06
		HI	**0.09**

Note: SSL for toluene is the risk-based value obtained from EPA and not the saturation limit presented and noted in Table 3.1-1.

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional risk-ased screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-109
Industrial Radionuclide Screening for SWMU 41-001

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Total Dose (mrem/yr)
Plutonium-238	0.37	240	0.02
Tritium	0.19	440000	7E-06
Uranium-235/236	0.15	87	0.03
		Total Dose	**0.05**

*SALs from LANL 2005, 088493.

Table G-4.2-110
Recreational Carcinogenic Screening for SWMU 41-001

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Arsenic	1.2	27.7	4E-07
Benzo(b)fluoranthene	0.04	30.1	1E-08
Benzo(k)fluoranthene	0.037	301	1E-09
Chrysene	0.046	3010	2E-10
Indeno(1,2,3-cd)pyrene	0.36	30.1	1E-07
Total Excess Cancer Risk			**5E-07**

*SSLs from LANL 2007, 094496.

Table G-4.2-111
Recreational Noncarcinogenic Screening Evaluation for SWMU 41-001

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Hazard Quotients
Aluminum	2460	100000	0.02
Barium	40.5	100000	4E-04
Chromium	2.4	14300	2E-04
Copper	4	31700	1E-04
Iron	4340	100000	0.04
Lead	13.8	560	0.02
Manganese	199	36900	5E-03
Nickel	2.1	15800	1E-04
Nitrate	2.1	100000	7E-05
Perchlorate	7.2	79.2	1E-04
Vanadium	6.1	792	8E-03
Zinc	33.4	100000	3E-04
Di-n-butylphthalate	0.13	39900	3E-06
Fluoranthene	0.055	13900	4E-06
Pyrene	0.051	23800	2E-06
Toluene	0.011	54100	2E-07
		HI	**0.09**

Note: SSL for toluene is the risk-based value obtained and not the saturation limit presented and noted in Table 3.1-1.

*SSLs from LANL 2007, 094496.

Table G-4.2-112
Recreational Radionuclide Screening for SWMU 41-001

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Total Dose (mrem/yr)
Plutonium-238	0.37	330	0.02
Tritium	0.19	5.1E+06	5.6E-07
Uranium-235/236	0.15	520	0.004
		Total Dose	**0.02**

*SALs from LANL 2005, 088493.

Table G-4.2-113
Residential Carcinogenic Screening for SWMU 41-001

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Arsenic	0.79	3.9	2.0E-06
Chromium	8.04	2800[b]	2.9E-08
Benzo(a)pyrene	0.25	0.621	4.0E-06
Benzo(b)fluoranthene	0.26	6.21	4.2E-07
Benzo(k)fluoranthene	0.1	62.1	1.6E-08
Chrysene	0.073	615	1.2E-09
Indeno(1,2,3-cd)pyrene	0.18	6.21	2.9E-07
		Total Excess Cancer Risk	**7E-07**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-114
Residential Noncarcinogenic Screening Evaluation for SWMU 41-001

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Aluminum	3071	77800	0.04
Barium	30.4	15600	2E-03
Copper	3.0	3130	1E-03
Iron	3371	23500	0.14
Lead	10.54	400	0.03
Manganese	167.6	3590	0.05
Nickel	3.8	1560	2E-03
Nitrate	5.01	100000	5E-05
Perchlorate	0.005	55[b]	9E-05
Selenium	0.21	391	5E-04
Vanadium	4.27	78.2	0.05
Zinc	25.97	23500	1E-03
Acetone	0.004	28100	1E-07
Anthracene	0.048	22000	2E-06
Benzo(g,h,i)perylene	0.14	2290[c]	6E-05
Benzyl alcohol	0.04	31000[b]	1E-06
Di-n-butylphthalate	0.11	6110	2E-05
Fluoranthene	0.055	2290	2E-05
Pyrene	0.063	2290	3E-05
Toluene	0.0056	5000[b]	1E-06
		HI	**0.3**

Note: SSL for toluene is the risk-based value obtained from EPA and not the saturation limit presented and noted in Table 3.1-1.

[a] SSL from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional risk-based screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

[c] SSL for pyrene used as a surrogate for benzo(g,h,i)perylene based on structural similarity.

Table G-4.2-115
Residential Radionuclide Screening for SWMU 41-001

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Total Dose (mrem/yr)
Plutonium-238	0.093	37	0.04
Tritium	0.31	750	0.01
Uranium-235/236	0.17	17	0.15
		Total Dose	**0.2**

*SALs from LANL 2005, 088493.

Table G-4.2-116
Dioxin/Furan Calculation for AOC 43-001(b2) for the Recreational Scenario

COPC	EPC (mg/kg) 0–1 ft	Toxic Equivalency Factor (TEF)*	Calculation
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	2.06E-04	0.001	2.06E-07
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	1.51E-06	0.1	1.51E-07
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	7.14E-06	0.1	7.14E-07
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	2.47E-06	0.1	2.47E-07
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	2.60E-03	0.0003	7.80E-07
Pentachlorodibenzodioxin[1,2,3,7,8-]	1.13E-06	1	1.13E-06
Tetrachlorodibenzodioxin[2,3,7,8-]	4.01E-07	1	4.01E-07
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	2.90E-05	0.01	2.90E-07
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	3.93E-06	0.01	3.93E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	1.64E-06	0.1	1.64E-07
Hexachlorodibenzofuran[1,2,3,6,7,8-]	8.77E-07	0.1	8.77E-08
Hexachlorodibenzofuran[1,2,3,7,8,9-]	2.91E-07	0.1	2.91E-08
Hexachlorodibenzofuran[2,3,4,6,7,8-]	2.09E-06	0.1	2.09E-07
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	7.55E-05	0.0003	2.27E-08
Pentachlorodibenzofuran[1,2,3,7,8-]	7.66E-07	0.03	2.30E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	9.90E-07	0.3	2.97E-07
Tetrachlorodibenzofuran[2,3,7,8-]	1.71E-06	0.1	1.71E-07
		2,3,7,8-TCDD Sum	**4.96E-06**

*TEFs from www.who.int/ipcs/assessment/tef_update/en/print.html.

Table G-4.2-117
Recreational Carcinogenic Screening for AOC 43-001(b2)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Arsenic	1.87	27.7	7E-07
Aroclor-1254	0.012	10.5	1E-08
Aroclor-1260	0.035	10.5	3E-08
Benzo(a)anthracene	3.48	30.1	1E-06
Benzo(a)pyrene	3.41	3.01	1E-05
Benzo(b)fluoranthene	3.66	30.1	1E-06
Benzo(k)fluoranthene	3.45	301	1E-07
Bis(2-ethylhexyl)phthalate	0.30	1830	2E-09
Butylbenzylphthalate	0.28	79700	4E-11
Chrysene	3.75	3010	1E-08
Dibenz(a,h)anthrecene	0.42	3.01	1E-06
Indeno(1,2,3-cd)pyrene	1.46	30.1	5E-07
Methylene chloride	0.0016	3300	5E-12
TCDD[2,3,7,8-] equivalent	4.96E-06	2.77E-04	2E-07
Total Excess Cancer Risk			**1E-05**

Note: SSL for methylene chloride is the risk-based value obtained from LANL and not the saturation limit presented and noted in Table 3.1-1.

*SSLs from LANL 2007, 094496.

Table G-4.2-118
Recreational Noncarcinogenic Screening Evaluation for AOC 43-001(b2)

COPC	EPC (mg/kg)	Recreational SSL[a] (mg/kg)	Hazard Quotients
Barium	38.1	100000	4E-04
Cadmium	0.22	392	6E-04
Chromium	12.94	14300	9E-04
Copper	10.2	31700	3E-04
Cyanide	3.1	7970	4E-04
Lead	57.9	560	0.1
Nickel	6.2	15800	4E-04
Nitrate	1.06	100000	1E-05
Selenium	0.3	3960	7E-05
Zinc	109.3	100000	1E-03
Acenaphthene	0.52	47500	1E-05
Anthracene	0.87	100000	9E-06
Aroclor-1254	0.012	6.65	2E-03
Aroclor-1260	0.035	15.8	2E-03
Dibenzofuran	0.3	1580	2E-04
Benzo(g,h,i)perylene	1.54	23800[b]	6E-05
Di-n-butylphthalate	0.066	39900	2E-06
Fluoranthene	9.12	13900	7E-04
Fluorene	0.50	31700	2E-05
Methylnaphthalene[2-]	0.21	3170	7E-05
Naphthalene	0.44	15800	3E-05
Phenanthrene	7.05	12000	6E-04
Pyrene	10.3	23800	4E-04
Styrene	0.00041	64300	6E-09
		HI	**0.1**

Note: SSL for styrene is the risk-based value obtained from EPA and not the saturation limit presented and noted in Table 3.1-1.

[a] SSLs from LANL 2007, 094496.

[b] SSL for pyrene used as a surrogate for benzo(g,h,i)perylene based on structural similarity.

Table G-4.2-119
Recreational Radionuclide Screening for AOC 43-001(b2)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Total Dose (mrem/yr)
Uranium-235/236	0.21	520	0.006
		Total Dose	**0.01**

*SALs from LANL 2005, 088493.

Table G-4.2-120
Dioxin/Furan Calculation for AOC 43-001(b2)for the Residential Scenario

COPC	EPC (mg/kg) 0–1 ft	Toxic Equivalency Factor (TEF)*	Calculation
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	1.38E-04	0.001	1.38E-07
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	9.08E-07	0.1	9.08E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	7.20E-06	0.1	7.20E-07
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	1.54E-06	0.1	1.54E-07
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	1.58E-03	0.0003	4.74E-07
Pentachlorodibenzodioxin[1,2,3,7,8-]	7.05E-07	1	7.05E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	4.01E-07	1	4.01E-07
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	2.55E-05	0.01	2.55E-07
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	1.50E-06	0.01	1.50E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	9.74E-07	0.1	9.74E-08
Hexachlorodibenzofuran[1,2,3,6,7,8-]	5.42E-07	0.1	5.42E-08
Hexachlorodibenzofuran[1,2,3,7,8,9-]	2.11E-07	0.1	2.11E-08
Hexachlorodibenzofuran[2,3,4,6,7,8-]	8.52E-07	0.1	8.52E-08
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	7.20E-05	0.0003	2.16E-08
Pentachlorodibenzofuran[1,2,3,7,8-]	6.82E-07	0.03	2.05E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	6.59E-07	0.3	1.98E-07
Tetrachlorodibenzofuran[2,3,7,8-]	1.71E-06	0.1	1.71E-07
		2,3,7,8-TCDD Sum	**3.62E-06**

*TEFs from www.who.int/ipcs/assessment/tef_update/en/print.html.

Table G-4.2-121
Residential Carcinogenic Screening for AOC 43-001(b2)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Arsenic	1.86	3.9	5E-06
Chromium	9.9	2800[b]	4E-08
Aroclor-1254	0.012	2.2[b]	6E-08
Aroclor-1260	0.024	2.2[b]	1E-07
Benzo(a)anthracene	1.3	6.21	2E-06
Benzo(a)pyrene	1.3	0.621	2E-05
Benzo(b)fluoranthene	1.31	6.21	2E-06
Benzo(k)fluoranthene	1.27	62.1	2E-07
Bis(2-ethylhexyl)phthalate	0.3	347	7E-09
Butylbenzylphthalate	0.3	2600[b]	1E-09
Chrysene	1.37	615	2E-08
Dibenz(a,h)anthrecene	0.33	0.621	5E-06
Indeno(1,2,3-cd)pyrene	0.57	6.21	9E-07
Methylene chloride	0.0016	182	9E-11
TCDD[2,3,7,8-] equivalent	3.62E-06	4.14E-05	9E-07
		Total Excess Cancer Risk	**4E-05**

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table G-4.2-122
Residential Noncarcinogenic Screening Evaluation for AOC 43-001(b2)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Barium	34.1	15600	2E-03
Cadmium	0.16	39	4E-03
Copper	7.8	3130	2E-03
Cyanide	2.3	1220	2E-03
Lead	34.6	400	9E-02
Nickel	5.3	1560	3E-03
Nitrate	0.66	100000	7E-06
Selenium	0.3	391	7E-04
Zinc	81.1	23500	3E-03
Acenaphthene	0.35	3730	9E-05
Anthracene	0.52	22000	2E-05
Aroclor-1254	0.012	1.12	0.01
Aroclor-1260	0.024	1.12	0.02
Benzo(g,h,i)perylene	0.595	2290[b]	3E-04
Carbon Disulfide	0.0005	670[c]	8E-07
Dibenzofuran	0.26	142	2E-03
Di-n-butylphthalate	0.066	6110	1E-05
Fluoranthene	5.0	2290	2E-03
Fluorene	0.35	2660	1E-04
Methylnaphthalene[2-]	0.2	79.5[d]	2E-03
Naphthalene	0.3	79.5	4E-03
Phenanthrene	2.51	1830	1E-03
Pyrene	5.44	2290	2E-03
Styrene	0.00041	6500[c]	6E-08
Trimethylbenzene[1,2,4-]	0.0006	58	1E-05
		HI	**0.1**

Note: SSLs for carbon disulfide and styrene are the risk-based values obtained from EPA and not the saturation limits presented and noted in Table 3.1-1.

[a] SSLs from NMED 2006, 092513 unless otherwise noted.

[b] SSL for pyrene used as a surrogate for benzo(g,h,i)perylene based on structural similarity.

[c] EPA regional risk-based screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

[d] SSL for naphthalene used as a surrogate for methylnaphthalene[2-] based on structural similarity.

Table G-4.2-123
Residential Radionuclide Screening for AOC 43-001(b2)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Total Dose (mrem/yr)
Uranium-235/236	0.21	17	0.19
		Total Dose	**0.2**

*SALs from LANL 2005, 088493.

Table G-5.4-1
Ecological Screening Levels for Terrestrial Receptors

Analyte	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Inorganic Chemicals (mg/kg)											
Aluminum	na*	na	na	na	na	na	na	na	na	na	na
Antimony	45	na	na	na	na	na	2.9	0.26	0.48	78	5.00E-02
Arsenic	810	1100	160	42	26	18	160	15	32	6.8	18
Barium	41000	37000	11000	820	930	1000	3300	1300	1800	330	110
Beryllium	420	na	na	na	na	na	170	18	56	40	2.5
Cadmium	510	580	2	4.4	0.54	0.29	9.9	0.27	0.51	140	32
Chromium	30000	37000	7700	1900	1100	830	13000	750	1900	2.3	2.4
Cobalt	5400	3500	930	170	120	96	1800	160	400	na	13
Copper	3800	1600	110	38	22	15	270	38	64	80	70
Cyanide (total)	2200	0.58	0.47	0.1	0.1	0.1	740	310	340		
Lead	3700	810	120	21	16	14	370	72	120	1700	120
Manganese	41000	90000	35000	1400	1900	3100	2000	1500	1400	450	220
Mercury	46	0.28	8.20E-02	7.00E-02	2.20E-02	1.3E-02	22	1.7	3	0.05	34
Nickel	1200	2900	160	160	38	21	500	9.7	20	280	38
Nitrate	na	na	na	na	na	na	na	na	na	na	na
Perchlorate	na	na	na	na	na	na	na	na	na	na	na
Selenium	84	97	5.6	1	0.87	0.75	2.1	0.66	0.83	4.1	0.52
Silver	4100	840	19	11	4.3	2.6	150	14	24	na	560
Thallium	2.8	75	6.6	9.2	1.6	0.9	2.8	3.20E-02	6.80E-02	na	0.10
Vanadium	3300	170	84	8.9	7.6	6.7	1500	140	480	na	2.50E-02
Zinc	6000	3300	320	350	85	48	1800	98	170	120	160

Table G-5.4-1 (continued)

Analyte	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Organic Chemicals (mg/kg)											
Acenaphthene	6.2E+03	na	na	na	na	na	4.9E+02	1.2E+02	1.6E+02	na	2.5E-01
Acenaphthylene	5200	na	na	na	na	na	500	120	160	na	na
Acetone	2900	30000	1200	7.5	14	170	1.4	15	1.2	na	na
Anthracene	5800	na	na	na	na	na	1100	210	310	na	6.8
Aroclor-1254	1.5E-01	2.2E-01	1.7E-01	1.3E+00	8.0E-02	4.0E-02	5.2E+01	4.4E-01	8.8E-01	na	1.6E+02
Aroclor-1260	1.4E-01	4.6E+00	3.7E+00	4.6E+01	1.7E+00	8.8E-01	3.0E+03	1.0E+01	2.0E+01	na	na
Benzene	7600	na	na	na	na	na	35	47	24	na	na
Benzo(a)anthracene	32	na	na	na	na	na	6.2	3	3.4	na	18
Benzo(a)pyrene	380	na	na	na	na	na	280	53	85	na	na
Benzo(b)fluoranthene	250	na	na	na	na	na	130	38	52	na	18
Benzo(g,h,i)perylene	94	na	na	na	na	na	540	24	47	na	na
Benzo(k)fluoranthene	400	na	na	na	na	na	350	62	100	na	na
Benzoic Acid	350	na	na	na	na	na	4.2	1.0	1.3	na	na
Bis(2-ethylhexyl)phthalate	1.2	3.30E-02	4.5E-02	20	0.04	0.02	2700	0.59	1.1	na	na
Butanone[2-]	4.20E+05	na	na	na	na	na	420	2600	360	na	na
Butylbenzylphthalate	1900	na	na	na	na	na	2300	90	160	na	na
Chloroform	2300	na	na	na	na	na	17	8.2	8	na	na
Chrysene	25	na	na	na	na	na	6.5	2.4	3.1	na	na
Dibenz(a,h)anthracene	54	na	na	na	na	na	95	12	22	na	na
Dibenzofuran	na	na	na	na	na	na	na	na	na	na	6.1
Di-n-butylphthalate	5000	0.24	6.8E-02	0.39	2.10E-02	1.10E-02	16000	180	370	na	160
Fluoranthene	360	na	na	na	na	na	260	22	38	10	na
Fluorene	9300	na	na	na	na	na	1100	250	340	3.7	na

Table G-5.4-1 (continued)

Analyte	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Indeno(1,2,3-cd)pyrene	270	na	na	na	na	na	590	62	110	na	na
Methylene Chloride	1700	na	na	na	na	na	3.4	9	2.6	na	1600
Methylnaphthalene[2-]	130	na	na	na	na	na	16	2.5	3.8	na	na
Naphthalene	1200	590	100	3.4	5.7	16	12	27	9.7	na	1
Pentachlorophenol	13	5	2	31	0.72	0.36	170	0.81	1.6	31	5
Phenanthrene	290	na	na	na	na	na	59	10	15	5.5	na
Pyrene	360	na	na	na	na	na	110	22	32	10	na
Xylene (total)	130	3200	280	90	56	41	7	1.4	2	na	100
TCDD[2,3,7,8-] equivalent	1.2E-06	na	na	na	na	na	4.8E-05	2.9E-07	5.8E-07	5	na
Radionuclides (pCi/g)											
Americium-241	2.6E+04	6.2E+04	3.5E+04	1.3E+04	4000	4000	3.2E+04	3.1E+04	3.2E+04	44	2.1E+04
Cesium-134	320	1300	1700	1900	1700	1700	1000	1100	1100	770	1100
Cesium-137	680	2900	3700	4200	3700	3800	2300	2400	2400	1700	2300
Plutonium-238	3.0E+04	1.3E+05	3.2E+04	8.3E+03	2100	2000	1.2E+05	9.2E+04	1.1E+05	44	1.1E+05
Plutonium-239/240	3.3E+04	1.6E+05	3.4E+04	8.6E+03	2100	2100	1.7E+05	1.1E+05	1.5E+05	47	1.6E+05
Strontium-90	560	1900	2400	600	930	1500	1300	1700	1700	1200	1300
Tritium	1.9E+05	5.8E+05	6.3E+05	3.0E+05	4.4E+05	6.0E+05	2.3E+05	3.4E+05	3.3E+05	4.8E+04	3.6E+04
Uranium-234	45000	1.9E+05	1.2E+05	4.8E+04	1.4E+04	1.4E+04	9.6E+04	9.4E+04	9.1E+04	51	1.4E+04
Uranium-235/236	4800	10000	10000	9000	6400	6400	5100	5100	5100	55	4000

Note: Values from ECORISK Database, Version 2.3 (LANL 2008, 103352).

* na = Not available.

Table G-5.4-2
Minimum ESL Comparison for AOC 00-031(a)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Organic Chemicals (mg/kg)					
Acetone	0.054	1.2	Deer mouse	0.05	No
Butanone[2-]	0.0062	360	Deer mouse	2E-05	No
Methylene chloride	0.041	2.6	Deer mouse	0.02	No

Table G-5.4-3
Minimum ESL Comparison for SWMU 01-001(b)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Inorganic Chemicals (mg/kg)					
Cadmium	3.06	0.27	Shrew	**11.33**	**Yes**
Chromium (total)	27.20	2.3	Earthworm	**11.83**	**Yes**
Copper	18.29	15	Robin	**1.22**	**Yes**
Mercury	0.05	0.013	Robin	**3.61**	**Yes**
Nickel	12.71	9.7	Shrew	**1.31**	**Yes**
Selenium	0.24	0.52	Plant	**0.47**	**Yes**
Silver	6.77	2.6	Robin	**2.61**	**Yes**
Organic Chemicals (mg/kg)					
Acetone	0.0047	1.2	Deer mouse	0.004	No
Aroclor-1254	0.03	0.041	Robin	**0.72**	**Yes**
Methylene chloride	0.007	2.6	Deer mouse	0.003	No
Radionuclides (pCi/g)					
Cesium-134	0.054	320	Red fox	2E-04	No
Plutonium-238	0.13	44	Earthworm	3E-03	No
Plutonium-239/240	0.20	47	Earthworm	4E-03	No
Uranium-235	0.014	55	Earthworm	3E-04	No

Note: Bolded values indicate HQ greater than 0.3.

Table G-5.4-4
Hazard Index Analysis for SWMU 01-001(b)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Cadmium	3.1	0.01	0.01	**1.53**	**0.70**	**5.67**	**10.55**	**0.31**	**11.33**	**6.00**	0.02	0.10
Chromium (total)	27.2	0.0009	0.0007	0.004	0.01	0.02	0.03	0.002	0.04	0.01	**11.83**	**11.33**
Copper	18.3	0.005	0.01	0.17	**0.48**	**0.83**	**1.22**	0.07	**0.48**	0.29	0.23	0.26
Mercury	0.05	0.001	0.17	**0.57**	**0.67**	**2.13**	**3.61**	0.002	0.03	0.02	**0.94**	0.001
Nickel	12.7	0.01	0.004	0.08	0.08	**0.33**	**0.61**	0.03	**1.31**	**0.64**	0.05	**0.33**
Selenium	0.24	0.003	0.002	0.04	0.24	0.28	**0.32**	0.12	**0.37**	0.29	0.06	**0.47**
Silver	6.8	0.002	0.01	**0.36**	**0.62**	**1.57**	**2.60**	0.05	**0.48**	0.28	na*	0.01
Aroclor-1254	0.03	0.20	0.14	0.18	0.02	**0.38**	**0.73**	0.0006	0.07	0.03	na	0.0002
HI		0.2	0.3	**3**	**3**	**11**	**20**	0.6	**14**	**8**	**13**	**12**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table G-5.4-5
Minimum ESL Comparison for SWMU 01-001(c)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Inorganic Chemicals (mg/kg)					
Antimony	0.19	0.05	Plant	**3.86**	**Yes**
Arsenic	1.44	6.8	Earthworm	0.21	No
Barium	41.82	110	Plant	**0.38**	**Yes**
Beryllium	0.63	2.5	Plant	0.25	No
Chromium (total)	5.18	2.3	Earthworm	**2.25**	**Yes**
Cobalt	1.30	13	Plant	0.1	No
Copper	4.15	15	Robin	0.28	No
Lead	10.30	14	Robin	**0.74**	**Yes**
Mercury	0.34	0.013	Robin	**26.31**	**Yes**
Nickel	3.58	9.7	Shrew	**0.37**	**Yes**
Selenium	0.38	0.52	Plant	**0.73**	**Yes**
Thallium	0.17	0.032	Shrew	**5.31**	**Yes**
Vanadium	6.32	0.025	Plant	**253**	**Yes**
Organic Chemicals (mg/kg)					
Aroclor-1260	0.031	0.14	Red fox	0.22	No
Di-n-butylphthalate	0.049	0.011	Robin	**4.45**	**Yes**
Radionuclides (pCi/g)					
Plutonium-239/240	5.75	47	Earthworm	0.12	No

Note: Bolded values indicate HQ greater than 0.3.

Table G-5.4-6
Hazard Index Analysis for SWMU 01-001(c)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Antimony	0.19	0.004	na*	na	na	na	na	0.07	**0.73**	**0.40**	0.002	**3.80**
Barium	41.82	0.001	0.001	0.004	0.05	0.04	0.04	0.01	0.03	0.02	0.13	**0.38**
Chromium (total)	5.18	0.0002	0.0001	0.0007	0.003	0.005	0.01	0.0004	0.01	0.003	**2.25**	**2.16**
Lead	10.3	0.003	0.01	0.09	**0.49**	**0.64**	**0.74**	0.03	0.14	0.09	0.01	0.09
Mercury (inorganic)	0.34	0.007	**1.21**	**4.15**	**4.86**	**15.45**	**26.15**	0.02	0.20	0.11	**6.80**	0.01
Nickel	3.58	0.003	0.00	0.02	0.02	0.09	0.17	0.01	**0.37**	0.18	0.01	0.09
Selenium	0.38	0.005	0.004	0.07	**0.38**	**0.44**	**0.51**	0.18	**0.58**	**0.46**	0.09	**0.73**
Thallium	0.17	0.061	0.002	0.03	0.02	0.11	0.19	0.06	**5.31**	**2.50**	na	**1.70**
Vanadium	6.32	0.002	0.04	0.08	**0.71**	**0.83**	**0.94**	0.004	0.05	0.01	na	**253**
Di-n-butyl phthalate	0.05	0.00001	0.21	**0.74**	0.13	**2.38**	**4.55**	0.000003	0.0003	0.0001	na	0.0003
HI		0.09	1	**5**	**7**	**20**	**33**	0.4	**7**	**4**	**9**	**262**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table G-5.4-7
Minimum ESL Comparison for SWMU 01-001(e)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Organic Chemicals (mg/kg)					
Toluene	0.0004	23	Shrew	2E-05	No

Table G-5.4-8
Minimum ESL Comparison for SWMU 01-001(t)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Inorganic Chemicals (mg/kg)					
Arsenic	1.97	6.8	Earthworm	0.29	No
Barium	37.5	110	Plant	**0.34**	**Yes**
Chromium (total)	17.4	2.3	Earthworm	**7.55**	**Yes**
Copper	107.2	15	Robin	**7.15**	**Yes**
Lead	9.0	14	Robin	**0.64**	**Yes**
Nickel	9.0	9.7	Shrew	**0.93**	**Yes**
Selenium	0.36	0.52	Plant	**0.69**	**Yes**
Organic Chemicals (mg/kg)					
Acetone	0.0064	1.2	Deer mouse	0.01	No
Methylene chloride	0.017	2.6	Deer mouse	0.007	No
Radionuclides (pCi/g)					
Uranium-235/236	0.17	55	Earthworm	0.003	No

Note: Bolded values indicate HQ greater than 0.3.

Table G-5.4-9
Hazard Index Analysis for SWMU 01-001(t)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Barium	37.5	0.0009	0.001	0.003	0.05	0.04	0.04	0.01	0.03	0.02	0.11	**0.34**
Chromium (total)	17.4	0.0006	0.0005	0.002	0.01	0.02	0.02	0.001	0.02	0.01	**7.57**	**7.25**
Copper	107.2	0.03	0.07	**0.97**	**2.82**	**4.87**	**7.15**	**0.40**	**2.82**	**1.68**	**1.34**	**1.53**
Lead	9	0.002	0.01	0.08	**0.43**	**0.56**	**0.64**	0.02	0.13	0.08	0.01	0.08
Nickel	9	0.01	0.003	0.06	0.06	0.24	**0.43**	0.02	**0.93**	**0.45**	0.03	0.24
Selenium	0.36	0.004	0.004	0.06	**0.36**	**0.41**	**0.48**	0.17	**0.55**	**0.43**	0.09	**0.69**
HI		0.04	0.09	1	**4**	**6**	**9**	0.6	**4**	**3**	**9**	**10**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

Table G-5.4-10
Minimum ESL Comparison for SWMU 01-001(u)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Inorganic Chemicals (mg/kg)					
Barium	97.08	110	Plant	**0.88**	**Yes**
Copper	8.1	15	Robin	**0.54**	**Yes**
Lead	27.28	14	Robin	**1.95**	**Yes**
Selenium	0.27	0.52	Plant	**0.52**	**Yes**
Organic Chemicals (mg/kg)					
Acetone	0.0061	1.2	Deer mouse	0.01	No
Bis(2-ethylhexyl)phthalate	0.062	0.02	Robin	**3.1**	**Yes**
Fluoranthene	0.048	10	Earthworm	0.005	No
Methylene chloride	0.0055	2.6	Deer mouse	0.002	No
Pyrene	0.048	10	Earthworm	0.005	No
Toluene	0.00095	23	Shrew	4E-05	No

Note: Bolded values indicate HQ greater than 0.3.

Table G-5.4-11
Hazard Index Analysis for SWMU 01-001(u)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Barium	97.08	0.002	0.003	0.01	0.12	0.10	0.10	0.03	0.07	0.05	0.29	**0.88**
Copper	8.1	0.002	0.005	0.07	0.21	0.37	0.54	0.03	0.21	0.13	0.1	0.12
Lead	27.28	0.01	0.03	0.23	**1.30**	**1.71**	**1.95**	0.07	**0.38**	0.23	0.02	0.23
Selenium	0.27	0.003	0.003	0.05	0.27	**0.31**	**0.36**	0.13	**0.41**	**0.33**	0.07	**0.52**
Bis(2-ethylhexyl)phthalate	0.01	0.01	0.19	0.14	0.0003	0.16	**0.31**	<0.0001	0.01	0.01	na*	na
HI		0.02	0.2	0.5	**2**	**3**	**3**	0.3	1	0.7	0.5	**2**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table G-5.4-12
Minimum ESL Comparison for SWMU 01-002

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Inorganic Chemicals (mg/kg)					
Antimony	0.08	0.05	Plant	**1.52**	**Yes**
Beryllium	0.48	2.5	Plant	0.19	No
Chromium (total)	17.21	2.3	Earthworm	**7.48**	**Yes**
Copper	2.06	15	Robin	0.14	No
Cyanide	0.23	0.1	Robin	**2.34**	**Yes**
Lead	13.73	14	Robin	**0.98**	**Yes**
Mercury	0.07	0.013	Robin	**5.65**	**Yes**
Nickel	9.04	9.7	Shrew	**0.93**	**Yes**
Selenium	0.31	0.52	Plant	**0.60**	**Yes**
Organic Chemicals (mg/kg)					
Acetone	0.0049	1.2	Deer mouse	0.004	No
Aroclor-1254	0.08	0.041	Robin	**1.98**	**Yes**
Aroclor-1260	0.01	0.14	Red fox	0.08	No
Bis(2-ethylhexyl)phthalate	0.12	0.02	Robin	**6.0**	**Yes**
Methylene chloride	0.003	2.6	Deer mouse	0.001	No
Toluene	0.00055	23	Shrew	2E-05	No
Radionuclides (pCi/g)					
Plutonium-238	0.11	44	Earthworm	3E-03	No
Plutonium-239/240	0.17	47	Earthworm	4E-03	No
Tritium	0.73	36000	Plant	2E-05	No
Uranium-235	0.14	55	Earthworm	3E-03	No

Note: Bolded values indicate HQ greater than 0.3.

Table G-5.4-13
Hazard Index Analysis for SWMU 01-002

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Antimony	0.08	0.002	na*	na	na	na	na	0.03	**0.31**	0.17	0.001	**1.6**
Chromium (total)	17.21	0.001	0.0005	0.002	0.01	0.02	0.02	0.001	0.02	0.01	**7.48**	**7.17**
Cyanide	0.23	0.0001	**0.40**	**0.50**	**2.34**	**2.34**	**2.34**	0.0003	0.001	0.001	na	na
Lead	13.73	0.004	0.02	0.11	**0.65**	**0.86**	**0.98**	0.04	0.19	0.11	0.01	0.11
Mercury (inorganic)	0.07	0.002	0.25	**0.85**	**1.00**	**3.18**	**5.38**	0.003	0.04	0.02	**1.40**	0.002
Nickel	9.04	0.01	0.003	0.06	0.06	0.24	**0.43**	0.02	**0.93**	**0.45**	0.03	0.24
Selenium	0.31	0.004	0.003	0.06	**0.31**	**0.36**	**0.41**	0.15	**0.47**	**0.37**	0.08	**0.60**
Aroclor-1254	0.08	**0.53**	**0.36**	**0.47**	0.06	**1.00**	**1.95**	0.00	0.18	0.09	na	0.001
Bis(2-ethylhexyl) phthalate	0.12	0.10	**3.64**	**2.67**	0.01	**3.00**	**6.00**	0.00	0.20	0.11	na	na
HI		0.6	**5**	**5**	**4**	**11**	**18**	0.2	**2**	1	**9**	**10**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table G-5.4-14
Minimum ESL Comparison for SWMU 01-003(e)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Inorganic Chemicals (mg/kg)					
Beryllium	1.09	2.5	Plant	**0.44**	**Yes**
Lead	20.97	14	Robin	**1.50**	**Yes**
Mercury	0.059	0.013	Robin	**4.54**	**Yes**
Nickel	7.13	9.7	Shrew	**0.74**	**Yes**
Selenium	0.44	0.52	Plant	**0.85**	**Yes**
Zinc	37.77	48	Robin	**0.79**	**Yes**
Organic Chemicals (mg/kg)					
Acenaphthene	0.172	0.25	Plant	**0.69**	**Yes**
Anthracene	0.11	6.8	Plant	0.02	No
Aroclor-1254	0.14	0.041	Robin	**3.41**	**Yes**
Aroclor-1260	0.052	0.14	Red fox	**0.37**	**Yes**
Benzo(a)anthracene	0.22	3	Shrew	0.07	No
Benzo(a)pyrene	0.22	53	Shrew	0.004	No
Benzo(b)fluoranthene	0.24	18	Plant	0.01	No
Benzo(g,h,i)perylene	0.13	24	Shrew	0.01	No
Benzo(k)fluoranthene	0.22	62	Shrew	0.004	No
Bis(2-ethylhexyl)phthalate	0.52	0.02	Robin	**26.00**	**Yes**
Butanone[2-]	0.0014	90	Shrew	4E-06	No
Chrysene	0.2	2.4	Shrew	0.08	No
Dibenz(a,h)anthracene	0.047	12	Shrew	0.004	No
Dibenzofuran	0.046	6.1	Plant	0.01	No
Di-n-butyl phthalate	0.046	0.011	Robin	**4.18**	**Yes**
Fluoranthene	0.19	10	Earthworm	0.02	No
Fluorene	0.079	3.7	Earthworm	0.02	No
Indeno(1,2,3-cd)pyrene	0.12	62	Shrew	0.002	No
Methylene chloride	0.0034	2.6	Deer mouse	0.001	No
Naphthalene	0.082	1	Plant	0.08	No
Phenanthrene	0.17	5.5	Earthworm	0.03	No
Pyrene	0.18	10	Earthworm	0.02	No
Tetrachloroethene	0.00016	0.18	Shrew	9E-04	No
Toluene	0.00038	23	Shrew	2E-05	No
Radionuclides (pCi/g)					
Cesium-137	0.14	680	Red fox	2E-04	No
Plutonium-239/240	0.7	47	Earthworm	0.01	No
Tritium	0.64	36000	Plant	2E-05	No

Note: Bolded values indicate HQ greater than 0.3.

Table G-5.4-15
Hazard Index Analysis for SWMU 01-003(e)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Beryllium	1.09	0.003	na*	na	na	na	na	0.01	0.06	0.02	0.03	**0.44**
Lead	20.97	0.01	0.03	0.17	**1.00**	**1.31**	**1.50**	0.06	0.29	0.17	0.01	0.17
Mercury	0.06	0.001	0.21	**0.73**	**0.86**	**2.73**	**4.62**	0.003	0.04	0.02	**1.20**	0.002
Nickel	7.13	0.01	0.002	0.04	0.04	0.19	**0.34**	0.01	**0.74**	**0.36**	0.03	0.19
Selenium	0.44	0.01	0.005	0.08	**0.44**	**0.51**	**0.59**	0.21	**0.67**	**0.53**	0.11	**0.85**
ZInc	37.77	0.01	0.02	0.12	0.11	**0.44**	**0.79**	0.02	**0.39**	0.22	**0.31**	0.24
Aroclor-1254	0.14	**0.93**	**0.64**	**0.82**	0.11	**1.75**	**3.41**	0.003	**0.32**	0.16	na	0.001
Aroclor-1260	0.052	**0.37**	0.01	0.01	0.001	0.03	0.06	<0.0001	0.01	0.003	na	na
Acenaphthene	0.17	0.00003	na	na	na	na	na	0.0004	0.001	0.001	na	**0.68**
Bis(2-ethylhexyl) phthalate	0.52	**0.43**	**16**	**12**	0.03	**13**	**26**	0.0002	**0.88**	**0.47**	na	na
Di-n-butylphthalate	0.046	<0.0001	0.19	**0.68**	0.12	**2.19**	**4.18**	<0.0001	0.0003	0.0001	na	0.0003
HI		**2**	**17**	**15**	**3**	**22**	**41**	0.3	**3**	**2**	**2**	**3**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.
*na = Not available.

Table G-5.4-16
Minimum ESL Comparison for SWU 01-006(d)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Inorganic Chemicals (mg/kg)					
Mercury	0.12	0.013	Robin	**9.23**	**Yes**
Organic Chemicals (mg/kg)					
Fluoranthene	0.053	10	Earthworm	0.01	No
Pyrene	0.053	10	Earthworm	0.01	No

Table G-5.4-17
Hazard Index Analysis for AOC 01-006(d)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Mercury	0.12	**46**	0.28	0.08	0.07	0.02	0.01	**22**	**1.7**	**3**	0.05	**34**
	HI	**46**	0.3	0.08	0.07	0.02	0.01	**22**	**2**	**3**	0.05	**34**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table G-5.4-18
Minimum ESL Comparison for AOC 01-006(g)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Inorganic Chemicals (mg/kg)					
Arsenic	3.77	6.8	Earthworm	**0.55**	**Yes**
Barium	46.82	110	Plant	**0.43**	**Yes**
Chromium (total)	14.32	2.3	Earthworm	**6.23**	**Yes**
Copper	7.22	15	Robin	**0.48**	**Yes**
Nickel	8.22	9.7	Shrew	**0.85**	**Yes**
Organic Chemicals (mg/kg)					
Aroclor-1260	0.017	0.14	Red fox	0.12	No
Bis(2-ethylhexyl)phthalate	0.056	0.02	Robin	**2.8**	**Yes**
Methylene chloride	0.028	2.6	Deer mouse	0.01	No
Radionuclides (pCi/g)					
Plutonium-239/240	1.1	47	Earthworm	0.02	No

Note: Bolded values indicate HQ greater than 0.3.

Table G-5.4-19
Hazard Index Analysis for AOC 01-006(g)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Arsenic	3.77	0.005	0.003	0.02	0.09	0.15	0.21	0.02	0.25	0.12	**0.55**	0.21
Barium	46.82	0.001	0.001	0.004	0.06	0.05	0.05	0.01	0.04	0.03	0.14	**0.43**
Chromium (total)	14.32	0.0005	0.0004	0.002	0.01	0.01	0.02	0.00	0.02	0.01	**6.23**	**5.97**
Copper	7.22	0.002	0.005	0.07	0.19	**0.33**	**0.48**	0.03	0.19	0.11	0.09	0.10
Nickel	8.22	0.01	0.003	0.05	0.05	0.22	0.39	0.02	**0.85**	**0.41**	0.03	0.22
Bis(2-ethylhexyl)phthalate	0.06	0.05	**1.82**	**1.33**	0.003	**1.50**	**3.00**	0.00	0.10	0.05	na*	na
HI		0.07	**2**	1	0.4	**2**	**4**	0.08	1	0.7	**7**	**7**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table G-5.4-20
Minimum ESL Comparison for SWMU 01-006(o)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Organic Chemicals (mg/kg)					
Aroclor-1254	0.27	0.041	Robin	**6.63**	**Yes**
Aroclor-1260	0.032	0.14	Red fox	0.23	No
Benzo(a)anthracene	0.051	3	Shrew	0.02	No
Benzo(a)pyrene	0.053	53	Shrew	0.001	No
Benzo(b)fluoranthene	0.062	18	Plant	0.003	No
Benzo(k)fluoranthene	0.048	62	Shrew	8E-04	No
Bis(2-ethylhexyl)phthalate	0.24	0.02	Robin	**12**	**Yes**
Chrysene	0.061	2.4	Shrew	0.03	No
Fluoranthene	0.13	10	Earthworm	0.01	No
Phenanthrene	0.066	5.5	Earthworm	0.01	No
Pyrene	0.11	10	Earthworm	0.01	No
Radionuclides (pCi/g)					
Plutonium-239/240	0.28	47	Earthworm	6E-03	No
Strontium-90	0.39	560	Red fox	7E-04	No
Tritium	1.42	36000	Plant	4E-05	No

Note: Bolded values indicate HQ greater than 0.3.

Table G-5.4-21
Hazard Index Analysis for SWMU 01-006(o)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Aroclor-1254	0.27	**1.80**	**1.23**	**1.59**	0.21	**3.38**	**6.59**	0.01	**0.61**	**0.31**	na*	0.002
Bis(2-ethylhexyl)phthalate	0.24	0.20	**7.27**	**5.33**	0.01	**6.00**	**12.00**	0.00009	**0.41**	0.22	na	na
	HI	**2**	**9**	**7**	0.2	**9**	**19**	0.01	1	0.5	na	0.002

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table G-5.4-22
Minimum ESL Comparison for SWMU 01-007(d)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Inorganic Chemicals (mg/kg)					
Chromium (total)	53.3	2.3	Earthworm	**23**	**Yes**
Lead	15.6	14	Robin	**1.1**	**Yes**
Nickel	26	9.7	Shrew	**2.7**	**Yes**
Selenium	0.42	0.52	Plant	**0.81**	**Yes**
Organic Chemicals (mg/kg)					
Aroclor-1260	0.025	0.14	Red fox	0.18	No
Di-n-octyl phthalate	0.43	1.1	Shrew	**0.39**	**Yes**
Methylene chloride	0.0033	2.6	Deer mouse	0.001	No

Note: Bolded values indicate HQ greater than 0.3.

Table G-5.4-23
Hazard Index Analysis for SWMU 01-007(d)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Chromium (total)	53.3	0.002	0.001	0.01	0.03	0.05	0.06	0.004	0.07	0.03	**23.17**	**22.21**
Lead	15.6	0.004	0.02	0.13	**0.74**	**0.98**	**1.11**	0.04	0.22	0.13	0.01	0.13
Nickel	26	0.02	0.01	0.16	0.16	**0.68**	**1.24**	0.05	**2.68**	**1.30**	0.09	**0.68**
Selenium	0.42	0.01	0.004	0.08	**0.42**	**0.48**	**0.56**	0.20	**0.64**	**0.51**	0.10	**0.81**
Di-n-octylphthalate	0.43	0.03	na*	na	na	na	na	0.00003	**0.39**	0.20	na	na
HI		0.06	0.03	0.4	1	**2**	**3**	0.3	**4**	**2**	**23**	**24**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table G-5.4-24
Minimum ESL Comparison for SWMU 01-007(e)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Inorganic Chemicals (mg/kg)					
Barium	53.5	110	Plant	**0.49**	**Yes**
Copper	9.9	15	Robin	**0.66**	**Yes**
Nickel	7.3	9.7	Shrew	**0.75**	**Yes**
Selenium	0.3	0.52	Plant	**0.62**	**Yes**
Silver	3.1	2.6	Robin	**1.19**	**Yes**
Organic Chemicals (mg/kg)					
Anthracene	0.079	6.8	Plant	0.01	No
Aroclor-1254	0.28	0.041	Robin	**6.8**	**Yes**
Benzo(a)anthracene	1.6	3	Shrew	**0.53**	**Yes**
Benzo(a)pyrene	0.88	53	Shrew	0.02	No
Benzo(b)fluoranthene	2	18	Plant	0.11	No
Benzo(g,h,i)perylene	0.89	24	Shrew	0.04	No
Benzo(k)fluoranthene	1.8	62	Shrew	0.03	No
Chrysene	3	2.4	Shrew	**1.25**	**Yes**
Ethylbenzene	0.0001	24	Deer mouse	4E-06	No
Fluoranthene	1.5	10	Earthworm	0.15	No
Indeno(1,2,3-cd)pyrene	0.78	62	Shrew	0.01	No
Phenanthrene	0.2	5.5	Earthworm	0.04	No
Pyrene	1.6	10	Earthworm	0.16	No

Note: Bolded values indicate HQ greater than 0.3.

Table G-5.4-25
Hazard Index Analysis for SWMU 01-007(e)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Barium	53.50	0.001	0.001	0.005	0.07	0.06	0.05	0.02	0.04	0.03	0.16	**0.49**
Copper	9.9	0.003	0.01	0.09	0.26	**0.45**	**0.66**	0.04	0.26	0.15	0.12	0.14
Nickel	7.3	0.006	0.003	0.05	0.05	0.19	**0.35**	0.01	**0.75**	**0.37**	0.03	0.19
Selenium	0.32	0.004	0.003	0.06	**0.32**	**0.37**	**0.43**	0.15	**0.48**	**0.39**	0.08	**0.62**
Silver	3.10	0.001	0.004	0.16	0.28	**0.72**	**1.19**	0.02	0.22	0.13	na*	0.01
Aroclor-1254	0.28	**1.87**	**1.27**	**1.65**	0.22	**3.50**	**6.83**	0.01	**0.64**	**0.32**	na	0.00
Benzo(a)anthracene	1.6	0.05	na	na	na	na	na	0.26	**0.53**	**0.47**	na	0.09
Chrysene	3	0.12	na	na	na	na	na	0.40	**1.2**	**0.97**	na	na
HI		**2**	1	**2**	1	**5**	**10**	1	**4**	**3**	0.4	**2**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table G-5.4-26
Minimum ESL Comparison for SWMU 01-007(j)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Organic Chemicals (mg/kg)					
Aroclor-1254	0.67	0.041	Robin	**16**	**Yes**
Bis(2-ethylhexyl)phthalate	0.085	0.02	Robin	**4**	**Yes**
Di-n-butylphthalate	0.05	0.011	Robin	**5**	**Yes**

Note: Bolded values indicate HQ greater than 0.3.

Table G-5.4-27
Hazard Index Analysis for SWMU 01-007(j)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Aroclor-1254	0.67	**4.47**	**3.05**	**3.94**	**0.52**	**8.38**	**16.34**	0.01	**1.52**	**0.76**	na*	0.004
Bis(2-ethylhexyl) phthalate	0.08	0.07	**2.42**	**1.78**	0.004	**2.00**	**4.00**	3E-05	0.14	0.07	na	na
Di-n-butyl phthalate	0.05	1E-05	0.21	**0.74**	0.13	**2.38**	**4.55**	3E-06	0.0003	0.0001	na	0.0003
HI		**5**	**6**	**6**	0.7	**13**	**25**	0.01	**2**	0.8	na	0.004

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table G-5.4-28
Minimum ESL Comparison for AOC 01-007(k)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Inorganic Chemicals (mg/kg)					
Barium	46.44	110	Plant	**0.42**	**Yes**
Chromium (total)	20.14	2.3	Earthworm	**8.76**	**Yes**
Copper	159	15	Robin	**10.6**	**Yes**
Nickel	9.67	9.7	Shrew	**1.0**	**Yes**
Selenium	0.36	0.52	Plant	**0.69**	**Yes**
Organic Chemicals (mg/kg)					
Acetone	0.0064	1.2	Deer mouse	0.01	No
Methylene chloride	0.021	2.6	Deer mouse	0.008	No
Radionuclides (pCi/g)					
Uranium-235	0.18	55	Earthworm	0.003	No

Note: Bolded values indicate HQ greater than 0.3.

Table G-5.4-29
Hazard Index Analysis for AOC 01-007(k)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Barium	46.44	0.001	0.001	0.004	0.06	0.05	0.05	0.01	0.04	0.03	0.14	**0.42**
Chromium (total)	20.14	0.001	0.001	0.003	0.01	0.02	0.02	0.002	0.03	0.01	**8.76**	**8.39**
Copper	159	0.04	0.10	**1.45**	**4.18**	**7.23**	**10.60**	**0.59**	**4.18**	**2.48**	**1.99**	**2.27**
Nickel	9.67	0.01	0.003	0.06	0.06	0.25	**0.46**	0.02	**1.00**	**0.48**	0.03	0.25
Selenium	0.36	0.004	0.004	0.06	**0.36**	**0.41**	**0.48**	0.17	**0.55**	**0.43**	0.09	**0.69**
HI		0.06	0.1	**2**	**5**	**8**	**12**	0.8	**6**	**3**	**11**	**12**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

Table G-5.4-30
Minimum ESL Comparison for SWMU 03-009(j)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Inorganic Chemicals (mg/kg)					
Chromium (total)	15.13	2.3	Earthworm	**6.58**	**Yes**
Cyanide	0.16	0.1	Robin	**1.60**	**Yes**
Lead	15.74	14	Robin	**1.12**	**Yes**
Nickel	10.69	9.7	Shrew	**1.10**	**Yes**

Note: Bolded values indicate HQ greater than 0.3.

Table G-5.4-31
Hazard Index Analysis for SWMU 03-009(j)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Chromium (total)	15.13	0.001	0.00004	0.002	0.01	0.01	0.02	0.001	0.02	0.01	**6.58**	**6.30**
Cyanide	0.16	0.0001	0.28	**0.34**	**1.60**	**1.60**	**1.60**	0.0002	0.001	0.0005	na	na
Lead	15.74	0.004	0.02	0.13	**0.75**	**0.98**	**1.12**	0.04	0.22	0.13	0.01	0.13
Nickel	10.69	0.01	0.004	0.07	0.07	0.28	**0.51**	0.02	**1.10**	**0.53**	0.04	0.28
HI		0.02	0.3	0.5	**2**	**3**	**3**	0.1	1	0.7	**7**	**7**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

Table G-5.4-32
Dioxin/Furan TEF Calculations for Ecological Receptors at SWMU 32-001

COPC	EPC (mg/kg) 0–1 ft	Toxic Equivalency Factor (TEF)*	Calculation
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	4.38E-06	0.001	4.38E-09
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	3.16E-07	0.1	3.16E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	7.44E-07	0.1	7.44E-08
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	5.51E-07	0.1	5.51E-08
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	7.37E-05	0.0003	2.21E-08
Pentachlorodibenzodioxin[1,2,3,7,8-]	2.33E-07	1	2.33E-07
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	1.32E-05	0.01	1.32E-07
Hexachlorodibenzofuran[1,2,3,4,7,8-]	5.57E-07	0.01	5.57E-09
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	8.63E-07	0.1	8.63E-08
Hexachlorodibenzofuran[1,2,3,6,7,8-]	1.04E-06	0.1	1.04E-07
Hexachlorodibenzofuran[2,3,4,6,7,8-]	1.59E-06	0.1	7.80E-07
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	7.80E-06	0.0003	2.34E-09
Pentachlorodibenzofuran[1,2,3,7,8-]	2.25E-07	0.03	6.75E-09
Pentachlorodibenzofuran[2,3,4,7,8-]	3.25E-06	0.3	9.75E-07
		2,3,7,8-TCDD Sum	**2.5E-06**

*TEFs from www.who.int/ipcs/assessment/tef_update/en/print.html.

Table G-5.4-33
Minimum ESL Comparison for SWMU 32-001

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Inorganic Chemicals (mg/kg)					
Barium	138.40	110	Plant	**1.26**	**Yes**
Chromium (total)	13.55	2.3	Earthworm	**5.89**	**Yes**
Cobalt	5.44	13	Plant	**0.42**	**Yes**
Copper	9.14	15	Robin	**0.61**	**Yes**
Cyanide (total)	0.093	0.1	Robin	**1.00**	**Yes**
Mercury	0.15	0.013	Robin	**11.23**	**Yes**
Nickel	9.21	9.7	Shrew	**0.95**	**Yes**
Selenium	0.31	0.52	Plant	**0.60**	**Yes**
Silver	0.084	2.6	Robin	0.03	No
Zinc	43.46	48	Robin	**0.91**	**Yes**
Organic Chemicals (mg/kg)					
Acetone	0.0062	1.2	Deer mouse	0.01	No
Aroclor-1260	0.51	0.14	Red fox	**3.64**	**Yes**
Bis(2-ethylhexyl)phthalate	0.16	0.02	Robin	**8.00**	**Yes**
Dichloroethene[cis-1,2-]	0.01	23	Montane shrew	4E-04	No
Methylene Chloride	0.0059	2.6	Deer mouse	2E-03	No
Phenanthrene	0.04	5.5	Earthworm	0.01	No
Tetrachloroethene	0.0022	0.18	Montane shrew	0.01	No
Trichloroethene	0.009	42	Montane shrew	2E-04	No
TCDD[2,3,7,8-] equivalent	2.5E-06	2.9E-07	Shrew	**8.61**	**Yes**
Radionuclides (pCi/g)					
Plutonium-239/240	0.047	47	Earthworm	1E-03	No
Strontium-90	0.27	560	Red fox	5E-04	No

Note: Bolded values indicate HQ greater than 0.3.

Table G-5.4-34
Hazard Index Analysis for SWMU 32-001

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Barium	138.4	0.003	0.004	0.01	0.17	0.15	0.14	0.04	0.11	0.08	0.42	**1.26**
Chromium (total)	13.55	0.0005	0.0004	0.002	0.01	0.01	0.02	0.001	0.02	0.01	**5.89**	**5.65**
Cobalt	5.44	0.001	0.002	0.01	0.03	0.05	0.06	0.003	0.03	0.01	na*	**0.42**
Copper	9.14	0.002	0.01	0.08	0.24	**0.42**	**0.61**	0.03	0.24	0.14	0.11	0.13
Cyanide	0.1	5E-05	0.17	0.21	**1.00**	**1.00**	**1.00**	0.0001	0.0003	0.0003	na	na
Mercury (inorganic)	0.15	0.003	**0.54**	**1.83**	**2.14**	**6.82**	**11.54**	0.01	0.09	0.05	**3.00**	0.004
Nickel	9.21	0.01	0.00	0.06	0.06	0.24	0.44	0.02	**0.95**	**0.46**	0.03	0.24
Selenium	0.31	0.004	0.003	0.06	**0.31**	**0.36**	**0.41**	0.15	**0.47**	**0.37**	0.08	**0.60**
Silver	0.08	2E-05	0.0001	0.004	0.01	0.02	0.03	0.001	0.01	0.00	na	0.0001
Zinc	43.46	0.01	0.02	0.14	0.12	**0.51**	**0.91**	0.02	**0.44**	0.26	**0.36**	0.27
Aroclor-1260	0.51	**3.64**	0.11	0.14	0.01	0.30	**0.58**	0.0002	0.05	0.03	na	na
Bis(2-ethylhexyl) phthalate	0.16	0.13	**4.85**	**3.56**	0.01	**4.00**	**8.00**	0.0001	0.27	0.15	na	na
TCDD[2,3,7,8-] equivalent	2.5E-06	**2.08**	na	na	na	na	na	0.05	**8.62**	**4.31**	5.00E-07	na
HI		**6**	**6**	**6**	**4**	**14**	**24**	0.3	**11**	**6**	**10**	**9**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table G-5.4-35
Minimum ESL Comparison for AOC 32-004

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Inorganic Chemicals (mg/kg)					
Chromium (total)	25.01	2.3	Earthworm	**10.87**	**Yes**
Copper	13.36	15	Robin	**0.89**	**Yes**
Lead	87.06	14	Robin	**6.22**	**Yes**
Mercury	0.28	0.013	Robin	**21.77**	**Yes**
Nickel	10.61	9.7	Shrew	**1.09**	**Yes**
Selenium	0.25	0.52	Plant	**0.48**	**Yes**
Silver	1.85	2.6	Robin	**0.71**	**Yes**
Zinc	84.08	48	Robin	**1.75**	**Yes**
Organic Chemicals (mg/kg)					
Acenaphthene	0.19	0.25	Plant	**0.76**	**Yes**
Acetone	0.002	1.2	Deer mouse	2E-03	No
Anthracene	0.68	6.8	Plant	0.10	No
Benzo(a)anthracene	2.60	3	Shrew	**0.87**	**Yes**
Benzo(a)pyrene	2.71	53	Shrew	0.05	No
Benzo(b)fluoranthene	2.84	18	Plant	0.16	No
Benzo(g,h,i)perylene	1.60	24	Shrew	0.07	No
Benzo(k)fluoranthene	2.54	62	Shrew	0.04	No
Bis(2-ethylhexyl)phthalate	0.72	0.02	Robin	**36.20**	**Yes**
Butylbenzylphthalate	2.89	90	Shrew	0.03	No
Chrysene	4.71	2.4	Shrew	**1.96**	**Yes**
Di-n-octyl phthalate	0.097	1.1	Shrew	0.09	No
Fluoranthene	9.85	10	Earthworm	**0.99**	**Yes**
Fluorene	0.19	3.7	Earthworm	0.05	No
Indeno(1,2,3-cd)pyrene	1.56	62	Shrew	0.03	No
Naphthalene	0.23	1	Plant	0.23	No
Phenanthrene	3.43	5.5	Earthworm	**0.62**	**Yes**
Pyrene	4.71	10	Earthworm	**0.47**	**Yes**
Radionuclides (pCi/g)					
Americium-241	0.09	44	Earthworm	2E-03	No

Note: Bolded values indicate HQ greater than 0.3.

Table G-5.4-36
Hazard Index Analysis for AOC 32-004

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Chromium (total)	25.01	0.001	0.001	0.003	0.01	0.02	0.03	0.002	0.03	0.01	**11**	**10**
Copper	13.36	0.004	0.01	0.12	**0.35**	**0.61**	**0.89**	0.05	**0.35**	0.21	0.17	0.19
Lead	87.06	0.02	0.11	**0.73**	**4.15**	**5.44**	**6.22**	0.24	**1.21**	**0.73**	0.05	**0.73**
Mercury	0.28	0.01	**1.00**	**3.41**	**4.00**	**13**	**22**	0.01	0.16	0.09	**5.60**	0.01
Nickel	10.61	0.01	0.004	0.07	0.07	0.28	0.51	0.02	**1.09**	**0.53**	0.04	0.28
Selenium	0.25	0.003	0.003	0.04	0.25	0.29	0.33	0.12	**0.38**	**0.30**	0.06	**0.48**
Silver	1.85	0.0005	0.002	0.10	0.17	**0.43**	**0.71**	0.01	0.13	0.08	na*	0.003
Zinc	84.08	0.01	0.04	0.26	0.24	**0.99**	**1.75**	0.05	**0.86**	**0.49**	**0.70**	**0.53**
Acenaphthene	0.19	0.00003	na	na	na	na	na	0.0004	0.002	0.001	na	**0.76**
Benzo(a)anthracene	2.61	0.08	na	na	na	na	na	**0.42**	**0.87**	**0.77**	na	0.15
Bis(2-ethylhexyl) phthalate	0.72	**0.60**	**22**	**16**	0.04	**18**	**36**	0.0003	**1.22**	**0.65**	na	na
Chrysene	4.71	0.19	na	na	na	na	na	**0.72**	**1.96**	**1.52**	na	na
Fluoranthene	9.85	0.03	na	na	na	na	na	0.04	**0.45**	0.26	**0.99**	na
Phenanthrene	3.43	0.01	na	na	na	na	na	0.06	**0.34**	0.23	**0.62**	na
Pyrene	4.71	0.01	na	na	na	na	na	0.04	0.21	0.15	**0.47**	na
HI		1	**23**	**21**	**9**	**39**	**68**	**2**	**9**	**6**	**20**	**14**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table G-5.4-37
Minimum ESL Comparison for SWMU 41-001

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Inorganic Chemicals (mg/kg)					
Arsenic	0.78	6.8	Earthworm	0.12	No
Barium	27.18	110	Plant	0.25	No
Chromium (total)	2.02	2.3	Earthworm	**0.88**	**Yes**
Copper	2.91	15	Robin	0.19	No
Lead	10.42	14	Robin	**0.74**	**Yes**
Manganese	151.9	220	Plant	**0.69**	**Yes**
Nickel	2.24	9.7	Shrew	0.23	No
Selenium	0.21	0.52	Plant	**0.40**	**Yes**
Vanadium	3.91	0.025	Plant	**156**	**Yes**
Zinc	25.86	48	Robin	**0.54**	**Yes**
Organic Chemicals (mg/kg)					
Benzo(b)fluoranthene	0.045	18	Plant	2E-03	No
Benzo(k)fluoranthene	0.037	62	Shrew	6E-04	No
Bis(2-ethylhexyl)phthalate	0.13	0.02	Robin	**6.5**	**Yes**
Chrysene	0.046	2.4	Shrew	0.02	No
Di-n-butyl phthalate	0.11	0.011	Robin	**10.3**	**Yes**
Fluoranthene	0.055	10	Earthworm	0.01	No
Indeno(1,2,3-cd)pyrene	0.36	62	Shrew	0.01	No
Pyrene	0.051	10	Earthworm	0.01	No
Toluene	0.0042	23	Shrew	2E-04	No
Radionuclides (pCi/g)					
Plutonium-239/240	0.12	47	Earthworm	3E-03	No
Tritium	0.45	36000	Plant	1E-05	No
Uranium-235/236	0.18	55	Earthworm	3E-03	No

Note: Bolded values indicate HQ greater than 0.3.

Table G-5.4-38
Hazard Index Analysis for SWMU 41-001

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Chromium (total)	2.02	0.0001	0.0001	0.0003	0.001	0.002	0.002	0.0002	0.003	0.001	**0.88**	**0.84**
Lead	10.42	0.003	0.01	0.09	**0.50**	**0.65**	**0.74**	0.03	0.14	0.09	0.01	0.09
Manganese	151.9	0.004	0.002	0.004	0.11	0.08	0.05	0.08	0.10	0.11	**0.34**	**0.69**
Selenium	0.21	0.003	0.002	0.04	0.21	0.24	0.28	0.10	**0.32**	0.25	0.05	**0.40**
Vanadium	3.91	0.001	0.02	0.05	**0.44**	**0.51**	**0.58**	0.003	0.03	0.01	na*	**156**
Zinc	25.86	0.004	0.01	0.08	0.07	0.30	**0.54**	0.01	0.26	0.15	0.22	0.16
Bis(2-ethylhexyl) phthalate	0.13	0.11	**3.94**	**2.89**	0.01	**3.25**	**6.50**	0.00005	0.22	0.12	na	na
Di-n-butylphthalate	0.11	0.00	**0.46**	**1.62**	0.28	**5.24**	**10**	0.00001	0.001	0.0003	na	0.001
HI		0.1	**4**	**5**	**2**	**10**	**19**	0.2	1	0.7	1	**159**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table G-5.4-39
Dioxin/Furan TEF Calculations for Ecological Receptors at AOC 43-001(b2)

COPC	EPC (mg/kg) 0-1 ft	Toxic Equivalency Factor (TEF)*	Calculation
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	1.38E-04	0.001	1.38E-07
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	9.08E-07	0.1	9.08E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	7.20E-06	0.1	7.20E-07
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	1.54E-06	0.1	1.54E-07
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	1.58E-03	0.0003	4.74E-07
Pentachlorodibenzodioxin[1,2,3,7,8-]	7.05E-07	1	7.05E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	4.01E-07	1	4.01E-07
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	2.55E-05	0.01	2.55E-07
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	1.50E-06	0.01	1.50E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	9.74E-07	0.1	9.74E-08
Hexachlorodibenzofuran[1,2,3,6,7,8-]	5.42E-07	0.1	5.42E-08
Hexachlorodibenzofuran[1,2,3,7,8,9-]	2.11E-07	0.1	2.11E-08
Hexachlorodibenzofuran[2,3,4,6,7,8-]	8.52E-07	0.1	8.52E-08
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	7.20E-05	0.0003	2.16E-08
Pentachlorodibenzofuran[1,2,3,7,8-]	6.82E-07	0.03	2.05E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	6.59E-07	0.3	1.98E-07
Tetrachlorodibenzofuran[2,3,7,8-]	1.71E-06	0.1	1.71E-07
		2,3,7,8-TCDD Sum	**3.62E-06**

*TEFs from www.who.int/ipcs/assessment/tef_update/en/print.html.

Table G-5.4-40
Minimum ESL Comparison for AOC 43-001(b2)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Inorganic Chemicals (mg/kg)					
Arsenic	1.86	6.8	Earthworm	0.27	No
Barium	34.06	110	Plant	**0.31**	**Yes**
Cadmium	0.16	0.27	Shrew	**0.31**	**Yes**
Chromium (total)	9.89	2.3	Earthworm	**4.30**	**Yes**
Copper	7.75	15	Robin	**0.52**	**Yes**
Cyanide (total)	2.29	0.1	Robin	**22.86**	**Yes**
Lead	34.60	14	Robin	**2.47**	**Yes**
Nickel	5.25	9.7	Shrew	**0.54**	**Yes**
Selenium	0.28	0.52	Plant	**0.53**	**Yes**
Zinc	81.05	48	Robin	**1.69**	**Yes**
Organic Chemicals (mg/kg)					
Acenaphthene	0.35	0.25	Plant	**1.40**	**Yes**
Anthracene	0.52	6.8	Plant	0.08	No
Aroclor-1254	0.012	0.041	Robin	0.29	No
Aroclor-1260	0.024	0.14	Red fox	0.17	No
Benzo(a)anthracene	1.28	3	Shrew	**0.43**	**Yes**
Benzo(a)pyrene	1.28	53	Shrew	0.02	No
Benzo(b)fluoranthene	1.31	18	Plant	0.07	No
Benzo(g,h,i)perylene	0.60	24	Shrew	0.02	No
Benzo(k)fluoranthene	1.27	62	Shrew	0.02	No
Bis(2-ethylhexyl)phthalate	0.26	0.02	Robin	**12.75**	**Yes**
Butylbenzylphthalate	0.28	90	Shrew	3.1E-03	No
Chrysene	1.37	2.4	Shrew	**0.57**	**Yes**
Dibenz(a,h)anthracene	0.33	12	Shrew	0.03	No
Dibenzofuran	0.26	6.1	Plant	0.04	No
Di-n-butyl phthalate	0.066	0.011	Robin	**6.00**	**Yes**
Fluoranthene	5.02	10	Earthworm	**0.50**	**Yes**
Fluorene	0.35	3.7	Earthworm	0.09	No
Indeno(1,2,3-cd)pyrene	0.57	62	Shrew	0.01	No
Methylene chloride	0.0016	2.6	Deer mouse	6.15E-04	No
Methylnaphthalene(2-)	0.20	2.5	Shrew	0.08	No
Naphthalene	0.28	1	Plant	0.28	No
Phenanthrene	2.51	5.5	Earthworm	**0.46**	**Yes**
Pyrene	5.44	10	Earthworm	**0.54**	**Yes**
TCDD[2,3,7,8-] equivalent	3.62E-06	2.90E-07	Shrew	**12.49**	**Yes**
Radionuclides (pCi/g)					
Uranium-235/236	0.21	55	Earthworm	4E-03	No

Note: Bolded values indicate HQ greater than 0.3.

Table G-5.4-41
Hazard Index Analysis for AOC 43-001(b2)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Barium	34.06	0.001	0.001	0.003	0.04	0.04	0.03	0.01	0.03	0.02	0.10	**0.31**
Cadmium	0.16	0.0003	0.0003	0.08	0.04	0.30	**0.55**	0.02	**0.59**	**0.31**	0.001	0.01
Chromium (total)	9.89	0.0003	0.0003	0.001	0.01	0.01	0.01	0.00	0.01	0.01	**4.30**	**4.12**
Copper	7.75	0.002	0.005	0.07	0.20	**0.35**	**0.52**	0.03	0.20	0.12	0.10	0.11
Cyanide	2.29	0.001	**3.95**	**4.87**	**23**	**23**	**23**	0.003	0.01	0.01	na*	na
Lead	34.60	0.01	0.04	0.29	**1.65**	**2.16**	**2.47**	0.09	**0.48**	0.29	0.02	0.29
Nickel	5.25	0.004	0.002	0.03	0.03	0.14	0.25	0.01	**0.54**	0.26	0.02	0.14
Selenium	0.28	0.003	0.003	0.05	0.28	**0.32**	**0.37**	0.13	**0.42**	**0.34**	0.07	**0.54**
Zinc	81.05	0.01	0.03	0.25	0.23	**0.95**	**1.69**	0.05	**0.83**	**0.48**	**0.68**	**0.51**
Acenaphthene	0.35	0.0001	na	na	na	na	na	0.001	0.003	0.002	na	**1.40**
Benzo(a)anthracene	1.29	0.04	na	na	na	na	na	0.21	**0.43**	**0.38**	na	0.07
Bis(2-ethylhexyl) phthalate	0.26	0.22	**7.88**	**5.78**	0.01	**6.50**	**13**	0.00	**0.44**	0.24	na	na
Chrysene	1.37	0.05	na	na	na	na	na	0.21	**0.57**	**0.44**	na	na
Di-n-butylphthalate	0.07	0.00001	0.29	**1.03**	0.18	**3.33**	**6.36**	4E-06	0.0004	0.0002	na	0.0004
Fluoranthene	5.02	0.01	na	na	na	na	na	0.02	0.23	0.13	**0.50**	na
Phenanthrene	2.51	0.01	na	na	na	na	na	0.04	0.25	0.17	**0.46**	na
Pyrene	5.4	0.02	na	na	na	na	na	0.05	0.25	0.17	**0.54**	na
TCDD[2,3,7,8-] equivalent	3.62E-06	**3.02**	na	na	na	na	na	0.08	**12.49**	**6.24**	0.000001	na
HI		**3**	**12**	**12**	**26**	**37**	**48**	0.9	**18**	**10**	**7**	**7**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

*na = Not available.

Table G-5.5-1
Comparison of EPCs to Background Concentrations for SWMU 01-001(b)

COPEC	EPC (mg/kg)	Sediment Background Concentrations (mg/kg)	Tuff Background Concentrations (mg/kg)
Cadmium	3.1	0.05–0.18	0.1–1.5
Chromium (total)	27.2	0.8–9.2	0.25–13
Copper	18.3	0.77–12	0.25–6.2
Mercury	0.05	0.01–0.03	0.1*
Nickel	12.7	1–8.9	0.5–7
Selenium	0.24	0.3*	0.3*
Silver	6.8	0.05–0.28	0.2–1.9

Note: From LANL 1998, 059730.

* Value is the BV.

Table G-5.5-2
Comparison of EPCs to Background Concentrations for SWMU 01-001(c)

COPEC	EPC (mg/kg)	Sediment Background Concentrations (mg/kg)	Tuff Background Concentrations (mg/kg)
Antimony	0.2	0.83*	0.05–0.4
Barium	41.8	8–127	1.4–51.6
Chromium (total)	5.2	0.8–9.2	0.25–13
Lead	10.3	2–25.6	1.6–15.5
Mercury	0.3	0.1*	0.1*
Nickel	3.6	1–8.9	0.5–7
Selenium	0.4	0.3*	0.3*
Thallium	0.17	0.73*	0.05–1.7
Vanadium	6.3	1–20	0.25–21

Note: From LANL 1998, 059730.

* Value is the BV.

Table G-5.5-3
Comparison of EPCs to Background Concentrations for SWMU 01-001(t)

COPEC	EPC (mg/kg)	Tuff Background Concentrations (mg/kg)
Barium	37.5	1.4–51.6
Chromium (total)	17.4	0.25–13
Copper	107.2	0.25–6.2
Lead	9.0	1.6–15.5
Nickel	9.0	0.5–7
Selenium	0.36	0.3*

Note: From LANL 1998, 059730.

*Value is the BV.

Table G-5.5-4
Comparison of EPCs to Background Concentrations for SWMU 01-001(u)

COPEC	EPC (mg/kg)	Tuff Background Concentrations (mg/kg)
Barium	97.08	1.4–51.6
Copper	8.1	0.25-6.2
Lead	27.28	1.6–15.5
Selenium	0.27	0.3*

Note: From LANL 1998, 059730.

* Value is the BV.

Table G-5.5-5
Comparison of EPCs to Background Concentrations for SWMU 01-002

COPEC	EPC (mg/kg)	Soil Background Concentrations (mg/kg)	Tuff Background Concentrations (mg/kg)
Antimony	0.1	0.1–1	0.05–0.4
Chromium (total)	17.2	1.9–36.5	0.25–13
Cyanide	0.23	0.5*	0.5*
Lead	13.7	2–28	1.6–15.5
Mercury	0.07	0.1*	0.1*
Nickel	9.0	1–29	0.5–7
Selenium	0.3	0.1–1.7	0.3*

Note: From LANL 1998, 059730.

* Value is the BV.

Table G-5.5-6
Comparison of EPCs to Background Concentrations for SWMU 01-003(e)

COPEC	EPC (mg/kg)	Sediment Background Concentrations (mg/kg)	Soil Background Concentrations (mg/kg)	Tuff Background Concentrations (mg/kg)
Beryllium	1.09	0.04–1.3	0.04–3.95	0.04–1.8
Lead	20.97	2–25.6	2–28	1.6–15.5
Mercury	0.06	0.1*	0.1*	0.1*
Nickel	7.13	1–8.9	1–29	0.5–7
Selenium	0.44	0.3*	0.1–1.7	0.3*
Zinc	37.77	9–56.2	14–75.5	5.5–65.6

Note: From LANL 1998, 059730.

* Value is the BV.

Table G-5.5-7
Comparison of EPCs to Background Concentrations for SWMU 01-006(d)

COPEC	EPC (mg/kg)	Sediment Background Concentrations (mg/kg)	Tuff Background Concentrations (mg/kg)
Mercury	0.12	0.1*	0.1*

Note: From LANL 1998, 059730.

* Value is the BV.

Table G-5.5-8
Comparison of EPCs to Background Concentrations for AOC 01-006(g)

COPEC	EPC (mg/kg)	Sediment Background Concentrations (mg/kg)	Tuff Background Concentrations (mg/kg)
Arsenic	3.8	0.25–3.6	0.25–5
Barium	46.8	8–127	1.4–51.6
Chromium (total)	14.3	0.8–9.2	0.25–13
Copper	7.2	0.77–12	0.25–6.2
Nickel	8.2	1–8.9	0.5–7

Note: From LANL 1998, 059730.

Table G-5.5-9
Comparison of EPCs to Background Concentrations for SWMU 01-007(d)

COPEC	EPC (mg/kg)	Tuff Background Concentrations (mg/kg)
Chromium (total)	53.3	0.25–13
Lead	15.6	1.6–15.5
Nickel	26	0.5–7
Selenium	0.42	0.3*

Note: From LANL 1998, 059730.

* Value is the BV.

Table G-5.5-10
Comparison of EPCs to Background Concentrations for SWMU 01-007(e)

COPEC	EPC (mg/kg)	Tuff Background Concentrations (mg/kg)
Barium	53.5	1.4–51.6
Copper	9.9	0.25–6.2
Nickel	7.3	0.5–7
Selenium	0.32	0.3*
Silver	3.1	0.2–1.9

Note: From LANL 1998, 059730.

* Value is the BV.

Table G-5.5-11
Comparison of EPCs to Background Concentrations for AOC 01-007(k)

COPEC	EPC (mg/kg)	Tuff Background Concentrations (mg/kg)
Barium	46.4	1.4–51.6
Chromium (total)	20.1	0.25–13
Copper	159	0.25–6.2
Nickel	9.7	0.5–7
Selenium	0.36	0.3*

Note: From LANL 1998, 059730.

* Value is the BV.

Table G-5.5-12
Comparison of EPCs to Background Concentrations for SWMU 03-009(j)

COPEC	EPC (mg/kg)	Tuff Background Concentrations (mg/kg)
Chromium (total)	15.1	0.25–13
Cyanide	0.16	0.5*
Lead	15.7	1.6–15.5
Nickel	10.7	0.5–7

Note: From LANL 1998, 059730.

* Value is the BV.

Table G-5.5-13
Comparison of EPCs to Background Concentrations for SWMU 32-001

COPEC	EPC (mg/kg)	Soil Background Concentrations (mg/kg)	Tuff Background Concentrations (mg/kg)
Barium	138.4	21–410	1.4–51.6
Chromium (total)	13.6	1.9–36.5	0.25–13
Cobalt	5.44	1–9.5	3.14*
Copper	9.1	0.25–16	0.25–6.2
Cyanide	0.1	0.5*	0.5*
Mercury	0.2	0.1*	0.1*
Nickel	9.2	1–29	0.5–7
Selenium	0.3	0.1–1.7	0.3*
Silver	0.08	1.0*	0.2–1.9
Zinc	43.5	14–75.5	5.5–65.6

Note: From LANL 1998, 059730.

* Value is the BV.

Table G-5.5-14
Comparison of EPCs to Background Concentrations for AOC 32-004

COPEC	EPC (mg/kg)	Soil Background Concentrations (mg/kg)	Tuff Background Concentrations (mg/kg)
Chromium (total)	25.0	1.9-36.5	0.25-13
Copper	13.4	0.25–16	0.25–6.2
Lead	87.1	2–28	1.6–15.5
Mercury	0.3	0.1*	0.1*
Nickel	10.6	1–29	0.5–7
Selenium	0.2	0.1-1.7	0.3*
Silver	1.8	1.0*	0.2–1.9
Zinc	84.1	14–75.5	5.5–65.6

Note: From LANL 1998, 059730.

* Value is the BV.

Table G-5.5-15
Comparison of EPCs to Background Concentrations for SWMU 41-001

COPEC	EPC (mg/kg)	Sediment Background Concentrations (mg/kg)	Tuff (Qbt2) Background Concentrations (mg/kg)	Tuff (Qbt 1g) Background Concentrations (mg/kg)
Chromium (total)	2.0	0.8–9.2	0.25–13	0.25–2.3
Lead	10.42	2–25.6	1.6–15.5	2–20
Manganese	151.9	46–517	22–752	38–210
Selenium	0.21	0.3*	0.3*	0.3*
Vanadium	3.9	1–20	0.25–21	0.2–3.8
Zinc	25.86	9–56.2	5.5–65.6	5.3–46

Note: From LANL 1998, 059730.

* Value is the BV.

Table G-5.5-16
Comparison of EPCs to Background Concentrations for AOC 43-001(b2)

COPEC	EPC (mg/kg)	Sediment Background Concentrations (mg/kg)	Tuff Background Concentrations (mg/kg)
Barium	34.1	8–127	1.4–51.6
Cadmium	0.16	0.05–0.18	0.1–1.5
Chromium (total)	9.9	0.8–9.2	0.25–13
Copper	7.8	0.77–12	0.25–6.2
Cyanide	2.3	0.82*	0.5*
Lead	34.6	2–25.6	1.6–15.5
Nickel	5.2	1–8.9	0.5–7
Selenium	0.3	0.3*	0.3*
Zinc	81.0	9–56.2	5.5–65.6

Note: From LANL 1998, 059730.
* Value is the BV.

Table G-5.5-17
PAUFs and AUFs for Ecological Receptors

Receptor	Home Range[a] (ha)	Population Area[a] (ha)	PAUF[b] SWMU 01-003(e)	PAUF[c] SWMU 01-006(g)	PAUF[d] SWMU 01-002	PAUF[e] SWMU 01-006(o)	PAUF[f] SWMU 01-007(j)	PAUF[g] SWMU 32-001	PAUF[h] AOC 32-004	PAUF[i] SWMU 41-001	PAUF[j] AOC 43-001(b2)
American robin	0.42	16.8	0.02	0.002	0.01	0.005	0.004	5E-05	2E-04	0.01	0.003
American kestrel	106	4240	8E-05	7E-06	5E-05	2E-05	1E-05	2E-07	9E-07	2E-05	1E-05
Deer mouse	0.077	3.0	0.11	0.01	0.07	0.03	0.02	3E-04	1E-03	0.03	0.016
Desert cottontail	3.1	124	3E-03	2E-04	0.002	7E-04	5E-04	7E-06	3E-05	8E-04	0.0004
Montane shrew	0.39	15.6	0.02	0.002	0.01	0.01	0.004	6E-05	3E-04	0.01	0.003
Red fox	1038	41,520	8E-06	7E-07	5E-05	2E-06	1E-06	2E-08	1E-07	2E-06	1E-06
Mexican spotted owl[k]	366	n/a[l]	9E-04	8E-05	6E-04	2E-04	2E-04	2E-06	1E-05	3E-04	1E-04

[a] Values from EPA 1993, 059384.

[b] PAUF is calculated as the area of the site (0.34 ha) divided by the population area. No PAUF is calculated for earthworm or plants.

[c] PAUF is calculated as the area of the site (0.044 ha) divided by the population area. No PAUF is calculated for earthworm or plants.

[d] PAUF is calculated as the area of the site (0.06 ha) divided by the population area. No PAUF is calculated for earthworm or plants.

[e] PAUF is calculated as the area of the site (0.08 ha) divided by the population area. No PAUF is calculated for earthworm or plants.

[f] PAUF is calculated as the area of the site (0.23 ha) divided by the population area. No PAUF is calculated for earthworm or plants.

[g] PAUF is calculated as the area of the site (0.0009 ha) divided by the population area. No PAUF is calculated for earthworm or plants.

[h] PAUF is calculated as the area of the site (0.004 ha) divided by the population area. No PAUF is calculated for earthworm or plants.

[i] PAUF is calculated as the area of the site (0.1 ha) divided by the population area. No PAUF is calculated for earthworm or plants.

[j] PAUF is calculated as the area of the site (0.06 ha) divided by the population area. No PAUF is calculated for earthworm or plants.

[k] Value for Mexican spotted owl is the AUF based on individual HR.

[l] n/a = Not applicable.

Table G-5.5-18
PAUFs for Ecological Receptors

Receptor	Home Range[a] (ha)	Population Area[a] (ha)	PAUF[b] SWMU 01-001(b)	PAUF[c] SWMU 01-001(c)	PAUF[d] SWMU 01-001(t)	PAUF[e] SWMU 01-007(d)	PAUF[f] SWMU 01-007(e)	PAUF[g] SWMU 01-007(k)	PAUF[h] SWMU 03-009(j)	PAUF[i] AOC 43-001(b2)
American robin	0.42	16.8	0.001	8E-04	0.01	0.004	0.002	0.03	0.002	0.003
American kestrel	106	4240	4E-06	3E-06	4E-05	2E-05	9E-06	1E-04	9E-06	1E-05
Deer mouse	0.077	3.0	0.006	0.005	0.06	0.02	0.01	0.15	0.01	0.02
Desert cottontail	3.1	124	2E-04	1E-04	0.001	6E-04	3E-04	4E-03	3E-04	4E-04
Montane shrew	0.39	15.6	0.001	9E-04	0.01	0.004	0.003	0.03	0.003	0.003
Red fox	1038	41,520	5E-07	3E-07	4E-06	2E-06	1E-06	1E-05	1E-06	1E-06

[a] Values from EPA 1993, 059384.

[b] PAUF is calculated as the area of the site (0.019 ha) divided by the population area. No PAUF is calculated for earthworm or plants.

[c] PAUF is calculated as the area of the site (0.014 ha) divided by the population area. No PAUF is calculated for earthworm or plants.

[d] PAUF is calculated as the area of the site (0.17 ha) divided by the population area. No PAUF is calculated for earthworm or plants.

[e] PAUF is calculated as the area of the site (0.07 ha) divided by the population area. No PAUF is calculated for earthworm or plants.

[f] PAUF is calculated as the area of the site (0.04 ha) divided by the population area. No PAUF is calculated for earthworm or plants.

[g] PAUF is calculated as the area of the site (0.47 ha) divided by the population area. No PAUF is calculated for earthworm or plants.

[h] PAUF is calculated as the area of the site (0.04 ha) divided by the population area. No PAUF is calculated for earthworm or plants.

[i] PAUF is calculated as the area of the site (0.05 ha) divided by the population area. No PAUF is calculated for earthworm or plants.

Table G-5.5-19
Adjusted HQs and HIs for SWMU 01-001(b)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Silver	6.8	<0.0001	<0.0001	<0.0001	0.0007	0.002	0.003	<0.0001	0.0006	0.002	na*	0.01
Aroclor-1254	0.03	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	0.0008	<0.0001	<0.0001	0.0002	na	0.0002
HI		9E-08	6E-07	2E-06	0.0007	0.002	0.004	7E-06	0.0007	0.002	na	0.01

* na = Not available.

Table G-5.5-20
Adjusted HQs and HIs for SWMU 01-001(c)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Mercury	0.34	<0.0001	<0.0001	<0.0001	0.004	0.01	0.02	<0.0001	<0.0001	0.0005	**6.8**	0.01
Di-n-butyl phthalate	0.05	<0.0001	<0.0001	<0.0001	0.0001	0.002	0.004	<0.0001	<0.0001	<0.0001	na*	0.003
HI		3E-09	5E-06	2E-05	0.004	0.01	0.02	2E-06	0.0002	0.0005	**7**	0.01

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table G-5.5-21
Adjusted HQs and HIs for SWMU 01-001(t)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Copper	107.2	<0.0001	<0.0001	<0.0001	0.03	0.05	0.07	0.0005	0.03	0.09	**1.34**	**1.53**
	HI	1E-07	3E-06	4E-05	0.03	0.05	0.07	0.0005	0.03	0.09	1	**2**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

Table G-5.5-22
Adjusted HQs and HIs for SWMU 01-002

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Aroclor-1254	0.08	<0.0001	<0.0001	<0.0001	0.0008	0.014	0.027	<0.0001	0.003	0.007	na*	0.0005
Di-n-butyl phthalate	0.12	<0.0001	0.0002	0.0001	0.0004	0.04	0.082	<0.0001	0.003	0.008	na	na
	HI	4E-06	0.0002	0.0002	0.001	0.05	0.1	3E-06	0.006	0.02	na	0.0005

* na = Not available.

Table G-5.5-23
Adjusted HQs and HIs for SWMU 01-003(e)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Aroclor-1254	0.14	<0.0001	<0.0001	<0.0001	0.002	0.04	0.07	<0.0001	0.007	0.02	na*	0.001
Aroclor-1260	0.052	<0.0001	<0.0001	<0.0001	<0.0001	0.0006	0.001	<0.0001	0.0001	0.0003	na	na
Bis(2-ethylhexyl)phthalate	0.52	<0.0001	0.001	0.0009	0.0005	0.26	**0.53**	<0.0001	0.02	0.05	na	na
Di-n-butyl phthalate	0.046	<0.0001	<0.0001	<0.0001	0.002	0.04	0.08	<0.0001	<0.0001	<0.0001	na	0.0003
HI		1E-05	0.001	0.001	0.005	0.3	0.7	8E-06	0.03	0.07	na	0.001

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table G-5.5-24
Adjusted HQs and HIs for SWMU 01-006(g)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Bis(2-ethylhexyl)phthalate	0.06	<0.0001	0.002	0.001	0.0007	**0.37**	**0.73**	<0.0001	0.02	0.05	na*	na
HI		5E-06	0.002	0.001	0.0007	0.4	0.7	5E-06	0.02	0.05	na	na

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table G-5.5-25
Adjusted HQs and HIs for SWMU 01-006(o)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Aroclor-1254	0.27	<0.0001	<0.0001	<0.0001	0.001	0.02	0.03	<0.0001	0.003	0.008	na*	0.002
Bis(2-ethylhexyl)phthalate	0.24	<0.0001	0.0001	0.0001	<0.0001	0.03	0.06	<0.0001	0.002	0.006	na	na
HI		4E-06	0.0002	0.0001	0.001	0.05	0.09	3E-06	0.005	0.01	na	0.002

* na = Not available.

Table G-5.5-26
Adjusted HQs and HIs for SWMU 01-007(d)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Chromium	53.3	<0.0001	<0.0001	<0.0001	0.0001	0.0002	0.0003	<0.0001	0.0004	0.0006	**23.17**	**22.21**
Nickel	26	<0.0001	<0.0001	<0.0001	0.0007	0.0036	0.005	<0.0001	0.01	0.03	0.09	**0.68**
Di-n-octyl phthalate	0.43	<0.0001	na*	na	na	na	na	<0.0001	0.002	0.004	na	na
HI		8E-08	2E-07	3E-06	0.0008	0.004	0.005	3E-05	0.01	0.03	**23**	**23**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table G-5.5-27
Adjusted HQs and HIs for SWMU 01-007(e)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Aroclor-1254	0.28	<0.0001	<0.0001	<0.0001	0.0005	0.008	0.02	<0.0001	0.002	0.004	na*	0.002
Benzo(a)anthracene	1.6	<0.0001	na	na	na	na	na	<0.0001	0.001	0.006	na	0.09
Chrysene	3	<0.0001	na	na	na	na	na	0.0002	0.003	0.01	na	na
	HI	2E-06	1E-05	2E-05	0.0005	0.008	0.02	0.0002	0.006	0.02	na	0.09

* na = Not available.

Table G-5.5-28
Adjusted HQs and HIs for SWMU 01-007(j)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Aroclor-1254	0.67	<0.0001	<0.0001	<0.0001	0.002	0.03	0.06	<0.0001	0.006	0.01	na*	0.004
Benzo(a)anthracene	0.08	<0.0001	<0.0001	<0.0001	0.0001	0.007	0.01	<0.0001	0.0005	0.001	na	na
Di-n-butylphthalate	0.05	<0.0001	<0.0001	<0.0001	0.0004	0.008	0.02	<0.0001	<0.0001	<0.0001	na	0.0003
	HI	7E-06	8E-05	9E-05	0.002	0.05	0.09	6E-06	0.006	0.02	na	0.004

* na = Not available.

Table G-5.5-29
Adjusted HQs and HIs for SWMU 01-007(k)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Copper	159	<0.0001	<0.0001	0.0002	0.12	0.2	0.3	0.002	0.13	**0.38**	**1.99**	**2.27**
	HI	5E-07	1E-05	0.0002	0.1	0.2	0.3	0.002	0.1	0.4	**2**	**2**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

Table G-5.5-30
Adjusted HQs and HIs for SWMU 32-001

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Aroclor-1260	0.51	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0002	<0.0001	<0.0001	<0.0001	na*	na
Bis(2-ethylhexyl)phthalate	0.16	<0.0001	<0.0001	<0.0001	<0.0001	0.001	0.003	<0.0001	<0.0001	<0.0001	na	na
TCDD[2,3,7,8-] equivalent	1.8E-06	<0.0001	na	na	na	na	na	<0.0001	0.003	0.008	<0.0001	na
	HI	8E-07	7E-06	5E-06	7E-06	0.001	0.003	3E-06	0.003	0.009	4E-07	na

* na = Not available.

Table G-5.5-31
Adjusted HQs and HIs for AOC 32-004

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Lead	87.06	<0.0001	<0.0001	<0.0001	0.005	0.006	0.007	<0.0001	0.002	0.005	0.05	**0.73**
Mercury (inorganic)	0.28	<0.0001	<0.0001	<0.0001	0.03	0.02	0.03	<0.0001	0.0002	0.0006	**5.60**	0.01
Acenaphthene	0.19	<0.0001	na*	na	na	na	na	<0.0001	<0.0001	<0.0001	na	**0.76**
Benzo(a)anthracene	2.61	<0.0001	na	na	na	na	na	<0.0001	0.001	0.005	na	0.15
Bis(2-ethylhexyl)phthalate	0.72	<0.0001	<0.0001	<0.0001	<0.0001	0.02	0.04	<0.0001	0.002	0.004	na	na
Chrysene	4.71	<0.0001	na	na	na	na	na	0.0001	0.003	0.010	na	na
Fluoranthene	9.85	<0.0001	na	na	na	na	na	<0.0001	0.0006	0.0017	**0.99**	na
Phenanthrene	3.43	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.0004	<0.0001	0.0004	0.001	**0.62**	na
Pyrene	4.71	<0.0001	<0.0001	<0.0001	<0.0001	0.003	0.006	<0.0001	0.0003	0.0010	**0.47**	na
HI		5E-07	0.0001	0.0001	0.04	0.05	0.08	0.0002	0.008	0.03	**8**	**2**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table G-5.5-32
Adjusted HQs and HIs for SWMU 41-001

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Bis(2-ethylhexyl)phthalate	0.01	<0.0001	<0.0001	<0.0001	<0.0001	0.02	0.04	<0.0001	0.001	0.004	na*	<0.0001
Di-n-butyl phthalate	0.07	<0.0001	<0.0001	<0.0001	0.002	0.03	0.06	<0.0001	<0.0001	<0.0001	na	na
HI		3E-07	0.0001	0.0001	0.002	0.05	0.1	4E-08	0.001	0.004	na	0.0007

* na = Not available.

Table G-5.5-33
Adjusted HQs and HIs for AOC 43-001(b2)

Analyte	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Cyanide	2.29	<0.0001	<0.0001	<0.0001	0.07	0.07	0.07	<0.0001	<0.0001	0.0001	na*	na
Acenaphthene	0.35	<0.0001	na	na	na	na	na	<0.0001	<0.0001	<0.0001	na	**1.4**
Benzo(a)anthracene	1.29	<0.0001	na	na	na	na	na	<0.0001	0.001	0.006	na	0.07
Bis(2-ethylhexyl)phthalate	0.26	<0.0001	<0.0001	<0.0001	<0.0001	0.02	0.04	<0.0001	0.001	0.003	na	na
Chrysene	1.37	<0.0001	na	na	na	na	na	<0.0001	0.002	0.007	na	na
Di-n-butylphthalate	0.07	<0.0001	<0.0001	<0.0001	0.00005	0.01	0.02	<0.0001	<0.0001	<0.0001	na	0.0004
Fluoranthene	5.02	<0.0001	na	na	na	na	na	<0.0001	0.0007	0.002	**0.50**	na
Phenanthrene	2.51	<0.0001	na	na	na	na	na	<0.0001	0.0008	0.003	**0.46**	na
Pyrene	5.44	<0.0001	na	na	na	na	na	<0.0001	0.0008	0.003	**0.54**	na
TCDD[2,3,7,8-] equivalent	3.62E-06	<0.0001	na	na	na	na	na	<0.0001	0.04	0.1	<0.0001	na
HI		4E-06	0.0001	0.0001	0.07	0.1	0.1	2E-04	0.05	0.1	**2**	1

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Attachment G-1

ProUCL Files
(on DVD included with this document)

Attachment G-2

Johnson and Ettinger Model Spreadsheets
(on DVD included with this document)

Attachment G-3

Ecological Scoping Checklists

G3-1.0 ECOLOGICAL SCOPING CHECKLIST FOR 00-031(a), 01-001(b),(c),(e),(t),(u); 01-002, 01-003(e); 01-006(d),(g),(o); 01-007(d),(e),(j),(k); 32-001, 32-004

Part A—Scoping Meeting Documentation

Site ID	**00-031(a), 01-001(b),(c),(e),(t), (u); 01-002, 01-003(e); 01-006(d),(g),(o); 01-007(d),(e),(j),(k); 32-001, 32-004**
Form of site releases (solid, liquid, vapor). Describe all relevant known or suspected mechanisms of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential areas of release. Reference locations on a map as appropriate.	Between 1943 and 1965, research work on nuclear weapons was carried out at TA-00, former TA-32, and former TA-01. These activities generated releases from septic tanks, sanitary lines, the industrial waste line, outfalls, storm water drains, accidental spills or leaks, and placement of contaminated of contaminated materials at landfills. The potential areas of release would be the surface and subsurface media of the mesa.
List of Primary Impacted Media **(Indicate all that apply.)**	**Surface soil –** Applicable **Surface water/sediment –** Applicable (Sediment) **Subsurface –** Applicable **Groundwater –** N/A **Other, explain –** None
FIMAD vegetation class based on Arcview vegetation coverage **(Indicate all that apply.)**	**Water –** N/A **Bare Ground/Unvegetated –** Applicable **Spruce/fir/aspen/mixed conifer –** N/A **Ponderosa pine –** Applicable **Piñon juniper/juniper savannah –** Applicable **Grassland/shrubland –** Applicable **Developed –** Paved Roads, buildings
Is T&E Habitat Present? **If applicable, list species known or suspected to use the site for breeding or foraging.**	No T&E habitat is present.
Provide list of Neighboring/ Contiguous/ Up-gradient sites, include a brief summary of COPCs and form of releases for relevant sites and reference map as appropriate. **(Use information to evaluate need to aggregate sites for screening.)**	There are no up-gradient sites from the SWMUs/AOCs listed above. All contiguous and neighboring sites are included in the Upper Los Alamos Canyon Aggregate Area investigation.
Surface Water Erosion Potential Information	Run-on to sites occurs from storms. Run-off may infiltrate into the shallow subsurface or move as sheet flow down the slope into Los Alamos Canyon.

Part B—Site Visit Documentation

Site ID	**00-031(a), 01-001(b),(c),(e),(t), (u); 01-002, 01-003(e); 01-006(d),(g),(o); 01-007(d),(e),(j),(k); 32-001, 32-004**
Date of Site Visit	3/19/09
Site Visit Conducted by	John Branch, Andrew Goumas, Tracy McFarland

Receptor Information:

Estimate cover	Relative vegetative cover (high, medium, low, none) =low Relative wetland cover (high, medium, low, none) = none Relative structures/asphalt, etc. cover (high, medium, low, none) = high
Field notes on the FIMAD vegetation class to assist in ground-truthing the Arcview information	The areas in and around the SWMUs/AOCs on the mesa top town site are all urban and highly developed and there is a very small percentage of naturally occurring vegetation. Many of the areas contain several types of landscaping ranging from gravel to lawn. The little natural vegetation that does exist consists of large ponderosa pine trees, pinon-juniper stands, and small scrub species. The majority of the subsurfaces sampled were located beneath asphalt in and around populated and developed areas.
Field notes on T&E Habitat, if applicable. Consider the need for a site visit by a T&E subject matter expert to support the use of the site by T&E receptors.	There is no T&E habitat present at these sites.
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and make notes on the quality of habitat present at the site.**	Yes. Although the SWMUs/AOCs are not abundantly populated with receptors, there are plant and other ecological receptors present. The general types of receptors are terrestrial biota such as reptiles, small mammals, insects, birds, and plants. The habitat around the SWMUs/AOCs is highly developed and therefore not of high quality. The slope into Los Alamos Canyon also provides habitat for ecological receptors.

Contaminant Transport Information:

Surface water transport **Field notes on the erosion potential, including a discussion of the terminal point of surface water transport (if applicable).**	There is a low potential for surface water transport from the mesa top because the SWMUs/AOCs were located in the subsurface.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Sheet flow from the mesa top to the canyons occurs during summer storms and as a result of snow melt. Groundwater is located more than 1000 feet below the surface of the mesa top.
Interim action needed to limit off-site transport? **(yes/no/uncertain)** **Provide explanation/ recommendation to project lead for IA SMDP.**	No. The sites are subsurface. The mesa top currently has storm drainage systems.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	The SWMUs/AOCs have a high amount of physical disturbances due to development. These sites are located within a highly developed residential and commercial area, including roads and buildings.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	Yes, due to the developed commercial and residential area. The habitat is not natural and is not of great quality.
Interim action needed to limit apparent ecological effects? **(yes/no/uncertain)** **Provide explanation and recommendations to mitigate apparent exposure pathways to project lead for IA SMDP.**	No. The area is highly developed.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to offsite receptors, the remainder of the checklist should not be completed. Stop here and provide additional explanation/justification for proposing an ecological No Further Action recommendation (if needed). At a minimum, the potential for future transport should include likelihood that future construction activities could make contamination more available for exposure or transport. Not applicable.

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature, rate and extent of contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if the maximum value was captured by existing sample data.)**	Yes. The nature and extent of potential contamination has been defined for the SWMUs and AOCs listed above.
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if other sites should aggregated to characterize potential ecological risk.)**	Yes. The extent of contamination has been defined.

Part C—Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors via vapors?

- Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant $>10^{-5}$ atm-me/mol and molecular weight <200 g/mol).

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Volatile organic compounds are not frequently detected, most are in the subsurface, and are at low concentrations.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- Soil contamination would have to be on the actual surface of the soil to become available for dust.
- In the case of dust exposures to burrowing animals, the contamination would have to occur in the depth interval where these burrows occur.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Potential for dust entrainment on the mesa top is negligible due to highly developed area and landscaping.

Question C:

Can contaminated soil be transported to aquatic ecological communities?

- If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Sites are subsurface and there is little or no transport. Not aquatic communities are on the mesa top.

Question D:

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow groundwater?

- Known or suspected presence of contaminants in groundwater.
- The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.
- Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).
- Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: No seeps or springs are present on the mesa top and no perched water has been found. The depth to groundwater is greater than 1000 ft below ground surface.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- Suspected ability of contaminants to migrate to groundwater.
- The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.
- Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).
- Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Contaminants are unlikely to migrate to the regional aquifer given the depth to groundwater. The lack of a significant hydraulic driver (e.g., no ponded water on the surface) facilitating infiltration also mitigates the potential for contaminants reaching groundwater.

Question F:

Might erosion or mass wasting events be a potential release mechanism for contaminants from subsurface materials or perched aquifers to the surface?

- This question is only applicable to release sites located on or near the mesa edge.
- Consider the erodability of surficial material and the geologic processes of canyon/mesa edges.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Surface contamination is minimal across the site. There are no perched aquifers near these sites.

Question G:

Could airborne contaminants interact with receptors through respiration of vapors?

- Contaminants must be present as volatiles in the air.
- Consider the importance of inhalation of vapors for burrowing animals.
- Foliar uptake of organic vapors is typically not a significant exposure pathway.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 1

Terrestrial Animals: 1

Provide explanation: Volatile organic compounds are detected infrequently and at low concentrations.

Question H:

Could airborne contaminants interact with plants through deposition of particulates or with animals through inhalation of fugitive dust?

- Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.
- Exposure via inhalation of fugitive dust is particularly applicable to ground-dwelling species that would be exposed to dust disturbed by their foraging or burrowing activities or by wind movement.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 1

Terrestrial Animals: 1

Provide explanation: Buildings, roads, and parking areas minimize particulates and dust.

Question I:

Could contaminants interact with plants through root uptake or rain splash from surficial soils?

- Contaminants in bulk soil may partition into soil solution, making them available to roots.
- Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Provide explanation: Most contamination is subsurface. Areas are either developed or landscaped.

Question J:

Could contaminants interact with receptors through food web transport from surficial soils?

- The chemicals may bioaccumulate in animals.
- Animals may ingest contaminated food items.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Some bioaccumulating contaminants are present but at low concentrations.

Question K:

Could contaminants interact with receptors via incidental ingestion of surficial soils?

- Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Surface and subsurface soil contamination is minor.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

- Significant exposure via dermal contact would generally be limited to organic contaminants that are lipophilic and can cross epidermal barriers.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Lipophilic chemicals detected at some sites. Most detected concentrations are subsurface.

Question M:

Could contaminants interact with plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- Burial of contamination attenuates radiological exposure.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Terrestrial Animals: 2

Provide explanation: Gamma-emitting radionuclides only detected at a few sites at low concentrations.

Stream Channel

Question N:

Could contaminants interact with plants through direct uptake from water and sediment or sediment rain splash?

- Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters.

- Terrestrial plants may be exposed to particulates deposited on leaf and stem surfaces by rain striking contaminated sediments (i.e., rain splash) in an area that is only periodically inundated with water.
- Contaminants in sediment may partition into soil solution, making them available to roots.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Provide explanation: There are no aquatic environments onsite.

Question O:

Could contaminants interact with receptors through food web transport from water and sediment?

- The chemicals may bioconcentrate in food items.
- Animals may ingest contaminated food items.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question P:

Could contaminants interact with receptors via ingestion of water and suspended sediments?

- If sediments are present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediments.
- Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question Q:

Could contaminants interact with receptors through dermal contact with water and sediment?

- If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods.
- Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question R:

Could contaminants interact with plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- Burial of contamination attenuates radiological exposure.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question S:

Could contaminants bioconcentrate in free floating aquatic, attached aquatic plants, or emergent vegetation?

- Aquatic plants are in direct contact with water.
- Contaminants in sediment may partition into pore water, making them available to submerged roots.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants/Emergent Vegetation: 0

Provide explanation: There are no aquatic environments onsite.

Question T:

Could contaminants bioconcentrate in sedimentary or water column organisms?

- Aquatic receptors may actively or incidentally ingest sediment while foraging.
- Aquatic receptors may be directly exposed to contaminated sediments or may be exposed to contaminants through osmotic exchange, respiration, or ventilation of sediment pore waters.
- Aquatic receptors may be exposed through osmotic exchange, respiration, or ventilation of surface waters.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question U:

Could contaminants bioaccumulate in sedimentary or water column organisms?

- Lipophilic organic contaminants and some metals may concentrate in an organism's tissues
- Ingestion of contaminated food items may result in contaminant bioaccumulation through the food web.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question V:

Could contaminants interact with aquatic plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- The water column acts to absorb radiation, thus external irradiation is typically more important for sediment dwelling organisms.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

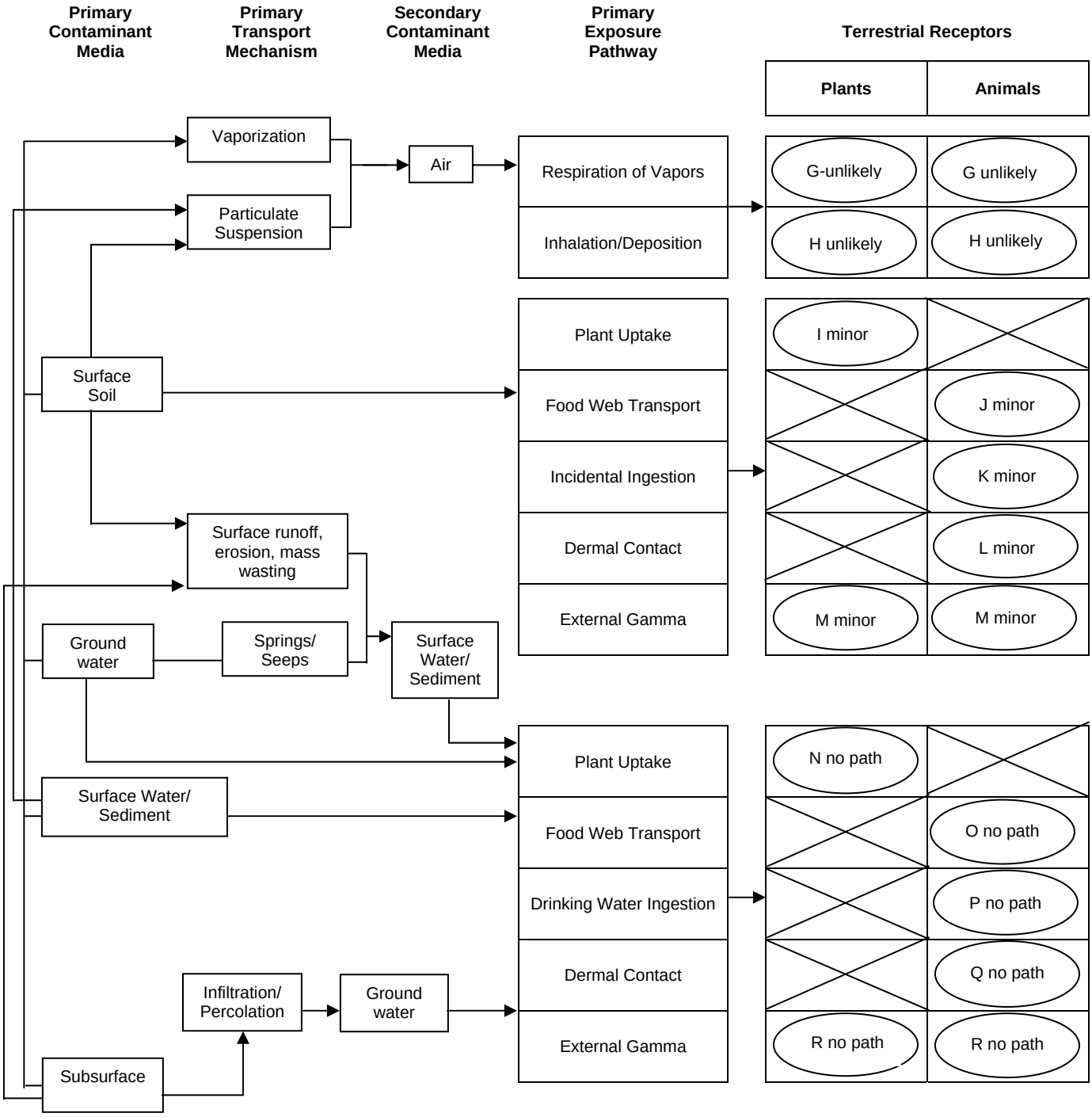
Aquatic Plants: 0

Aquatic Animals: 0

Provide explanation: There are no aquatic environments onsite.

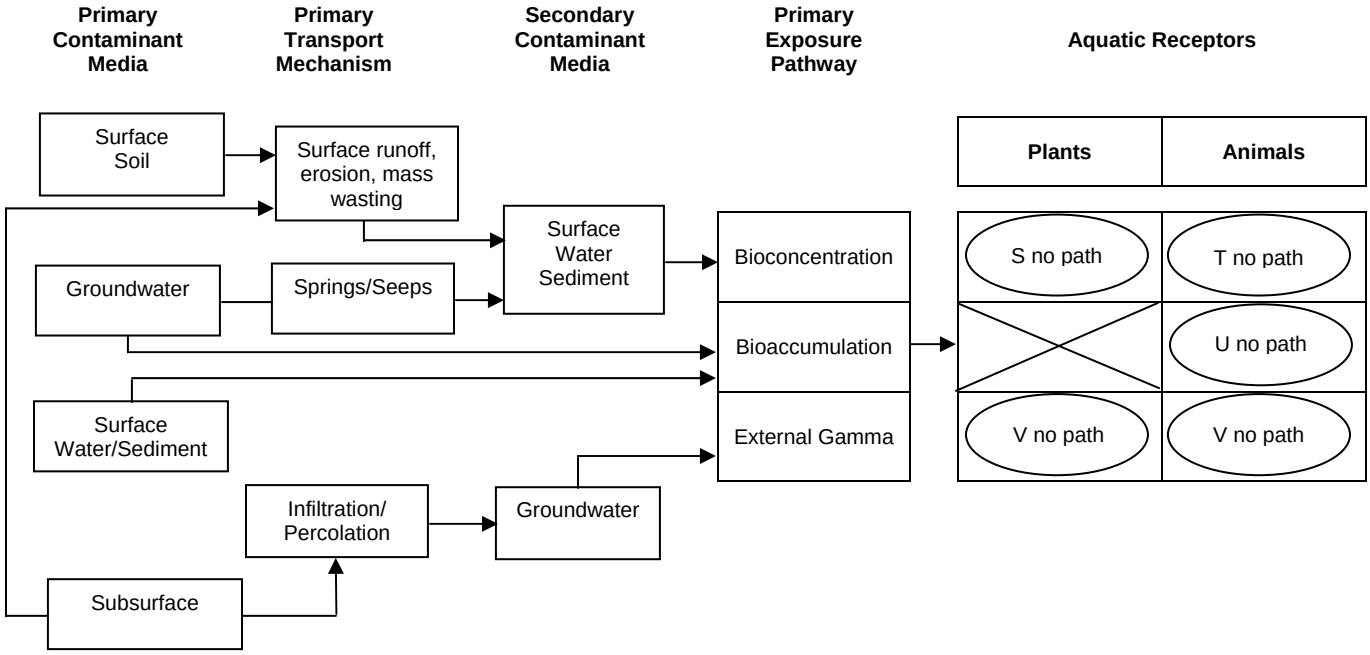
NOTE:
Letters in circles refer to questions on the Scoping Checklist

Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model



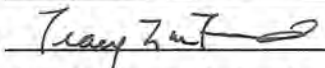
NOTE:
Letters in circles refer to questions on the Scoping Checklist

Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model

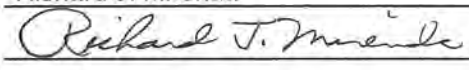


Signatures and certifications:

Checklist completed by (provide name, organization and phone number):

Name (printed): Tracy L. McFarland
Name (signature): 
Organization: Los Alamos Technical Associates, Inc.
Phone number: 505-662-1830
Date Completed: 05/23/2009

Verification by a member of ER Project Ecological Risk Task Team (provide name, organization and phone number):

Name (printed): Richard J. Mirenda
Name (signature): 
Organization: Los Alamos National Laboratory
Phone number: 505-665-6953
Date Completed: 05/26/2009

G3-2.0 ECOLOGICAL SCOPING CHECKLIST FOR 03-009(j), 43-001(b2)

Part A—Scoping Meeting Documentation

Site ID	**03-009(j), 43-001(b2)**
Form of site releases (solid, liquid, vapor). Describe all relevant known or suspected mechanisms of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential areas of release. Reference locations on a map as appropriate.	TA-03 is located on the western end of South Mesa and is almost completely developed. SWMU 03-009(j) is a surface disposal site under the parking lot of the Laboratory's Wellness Center. Potential contaminants at TA-03 may have been released into the environment through drainages, outfalls, or landfill areas; may have been inadvertently released as liquid spills, leaks, or spattering to surface soil from storage areas, storage tanks; or may have been released as surface impoundments. Surface and subsurface soil are potential areas of release. TA-43 was established in 1953 when the Laboratory's former Health Division, which conducted biomedical and industrial hygiene research first occupied HRL. AOC 43-001(b2) is a storm-drain outfall permitted in the mid-to-late 1970s under NPDES permit Outfall 03A040 and was removed from the Laboratory's NPDES permit on January 11, 1999. Contamination may have been released to the environment through drains or outfalls or by leaking from sewer lines. Surface and subsurface soil are potential areas of release.
List of Primary Impacted Media **(Indicate all that apply.)**	**Surface soil –** Applicable **Surface water/sediment –** Applicable (Sediment) **Subsurface –** Applicable **Groundwater –** N/A **Other, explain –** None
FIMAD vegetation class based on Arcview vegetation coverage **(Indicate all that apply.)**	**Water –** N/A **Bare Ground/Unvegetated –** Applicable **Spruce/fir/aspen/mixed conifer –** N/A **Ponderosa pine –** Applicable **Piñon juniper/juniper savannah –** Applicable **Grassland/shrubland –** Applicable **Developed –** Paved Roads, buildings
Is T&E Habitat Present? **If applicable, list species known or suspected to use the site for breeding or foraging.**	Yes. SWMU/AOC location information was intersected with T&E species habitat using GIS databases. The SWMU/AOC locations on the mesa tops are not applicable for T&E habitat but AOC 43-001(b2) does have potential T&E habitat. The AOC is within Mexican spotted owl nesting habitat and within an area where the owl can conservatively be assumed to forage at a high frequency. The AOC is also entirely within an area where the peregrine falcon can conservatively be assumed to forage at a relatively high frequency (Gonzales 1999, 062925).
Provide list of Neighboring/ Contiguous/ Up-gradient sites, include a brief summary of COPCs and form of releases for relevant sites and reference map as appropriate. **(Use information to evaluate need to aggregate sites for screening.)**	There are no up-gradient sites from the SWMUs/AOC listed above.

Surface Water Erosion Potential Information	Run-on to sites occurs from storms. Run-off may infiltrate into the shallow subsurface or move as sheet flow down the slope into Los Alamos Canyon.

Part B—Site Visit Documentation

Site ID	**03-009(j), 43-001(b2)**
Date of Site Visit	**01/16/2009**
Site Visit Conducted by	**John Branch, Andrew Goumas, Tracy McFarland**

Receptor Information:

Estimate cover	Relative vegetative cover (high, medium, low, none) =medium Relative wetland cover (high, medium, low, none) = none Relative structures/asphalt, etc. cover (high, medium, low, none) = medium
Field notes on the FIMAD vegetation class to assist in ground-truthing the Arcview information	AOC 43-001(b2) is located on the north rim mesa top near the HRL and medical center with adjacent paved roads and buildings. The portion of this AOC in and around the rim of Los Alamos Canyon contains a variable amount of vegetation. The vegetation is from the piñon-juniper and shrub species zone transitioning into a ponderosa pine vegetation zone. The portion of the AOC into the canyon contains transitional vegetation from the piñon-juniper zone and ponderosa pine zone. The TA-03 SWMUs are located on the south rim of Los Alamos Canyon in developed areas with landscaping and a low percentage of naturally occurring vegetation.
Field notes on T&E Habitat, if applicable. Consider the need for a site visit by a T&E subject matter expert to support the use of the site by T&E receptors.	The mesa top portions of the SWMU/AOC are not applicable for T&E habitat. The Los Alamos Canyon portion may provide foraging habitat for the Mexican spotted owl and the peregrine falcon. This portion of Los Alamos Canyon also potentially provides suitable nesting habitat for the Mexican spotted owl (Gonzales 1999, 062925).
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and make notes on the quality of habitat present at the site.**	Yes. The general types of receptors are terrestrial biota such as reptiles, small mammals, insects, birds and plants. The mesa top portions of the SWMUs/AOC are developed and therefore are not high quality habitat for the ecological receptors. The Los Alamos Canyon portion provides sustainable habitat for many of the aforementioned ecological receptors.

Contaminant Transport Information:

Surface water transport **Field notes on the erosion potential, including a discussion of the terminal point of surface water transport (if applicable).**	AOC 43-001(b2) does have the potential for surface water transport due to the physical nature of the location relative to paved roads, HRL, Omega Bridge, and the Los Alamos Medical Center. The mesa top area exhibits moderate vegetation, which mitigates the potential for erosion. The surface water transport terminates at the bottom of Los Alamos Canyon. The SWMUs at TA-03 do not have the potential for surface water transport or erosion. They are located in well developed/landscaped areas.

Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Yes. There is a low potential for surface water transport from the mesa top at AOC 43-001(b2). The SWMUs at TA-03 do not have the potential for off-site transport.
Interim action needed to limit off-site transport? **(yes/no/uncertain)** **Provide explanation/ recommendation to project lead for IA SMDP.**	No. The levels of contaminants are low.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	The SWMUs/AOC located on the mesa top have a high amount of physical disturbance because the area is developed and contain paved roads, landscaping, construction activities, and buildings. The portion of the SWMUs/AOC in Los Alamos Canyon is minimally disturbed and there is some evidence of erosion.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	No. Only effects are the result of the physical disturbances from development.
Interim action needed to limit apparent ecological effects? **(yes/no/uncertain)** **Provide explanation and recommendations to mitigate apparent exposure pathways to project lead for IA SMDP.**	No. The area remains highly developed.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to offsite receptors, the remainder of the checklist should not be completed. Stop here and provide additional explanation/justification for proposing an ecological No Further Action recommendation (if needed). At a minimum, the potential for future transport should include likelihood that future construction activities could make contamination more available for exposure or transport. Not applicable.

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature, rate and extent of contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if the maximum value was captured by existing sample data.)**	Yes. The Upper Los Alamos Canyon Aggregate Area project was designed to provide information on nature and extent. The nature and extent of contamination at these sites are defined.
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if other sites should aggregated to characterize potential ecological risk.)**	Yes. The data includes sites downgradient of the contamination to accommodate for potential transport pathways of site contamination.

Part C—Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors via vapors?

- Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant $>10^{-5}$ atm-me/mol and molecular weight <200 g/mol).

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Few volatile organic comp9unds were detected, all at low concentrations.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- Soil contamination would have to be on the actual surface of the soil to become available for dust.
- In the case of dust exposures to burrowing animals, the contamination would have to occur in the depth interval where these burrows occur.

Answer (likely/unlikely/uncertain): Likely

Provide explanation: Potential for dust entrainment on the mesa top is negligible due to developed areas. However, the potential for dust entrainment on the slopes is likely due to the low vegetation cover.

Question C:

Can contaminated soil be transported to aquatic ecological communities?

- If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no aquatic communities located within or near the sites. Concentrations are low and there is limited runoff from the sites.

Question D:

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow groundwater?

- Known or suspected presence of contaminants in groundwater.
- The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.
- Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).
- Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: here are no seeps or springs and no evidence of perched groundwater. The depth to groundwater is greater than 1000 ft below ground surface.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- Suspected ability of contaminants to migrate to groundwater.
- The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.
- Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).
- Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Contaminants are unlikely to migrate to the regional aquifer given the depth to groundwater. The lack of a significant hydraulic driver (e.g., no ponded water on the surface) facilitating infiltration also mitigates the potential for contaminants reaching groundwater.

Question F:

Might erosion or mass wasting events be a potential release mechanism for contaminants from subsurface materials or perched aquifers to the surface?

- This question is only applicable to release sites located on or near the mesa edge.
- Consider the erodability of surficial material and the geologic processes of canyon/mesa edges.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Surface contamination is minimal across the site. There are no perched aquifers near these sites.

Question G:

Could airborne contaminants interact with receptors through respiration of vapors?

- Contaminants must be present as volatiles in the air.
- Consider the importance of inhalation of vapors for burrowing animals.
- Foliar uptake of organic vapors is typically not a significant exposure pathway.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 1

Terrestrial Animals: 1

Provide explanation: Volatile organic compounds are detected infrequently and at low concentrations.

Question H:

Could airborne contaminants interact with plants through deposition of particulates or with animals through inhalation of fugitive dust?

- Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.
- Exposure via inhalation of fugitive dust is particularly applicable to ground-dwelling species that would be exposed to dust disturbed by their foraging or burrowing activities or by wind movement.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Terrestrial Animals: 2

Provide explanation: Contaminants may become airborne in the drainages.

Question I:

Could contaminants interact with plants through root uptake or rain splash from surficial soils?

- Contaminants in bulk soil may partition into soil solution, making them available to roots.
- Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Provide explanation: Contaminants may interact with plants within the drainages, but not in the developed areas.

Question J:

Could contaminants interact with receptors through food web transport from surficial soils?

- The chemicals may bioaccumulate in animals.
- Animals may ingest contaminated food items.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Some bioaccumulating contaminants are present but at low concentrations.

Question K:

Could contaminants interact with receptors via incidental ingestion of surficial soils?

- Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Surface and subsurface soil contamination is minor.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

- Significant exposure via dermal contact would generally be limited to organic contaminants that are lipophilic and can cross epidermal barriers.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Lipophilic chemicals detected at some sites. Most detected concentrations are subsurface.

Question M:

Could contaminants interact with plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- Burial of contamination attenuates radiological exposure.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: No gamma-emitting radionuclides were detected or detected above fallout.

Stream Channel

Question N:

Could contaminants interact with plants through direct uptake from water and sediment or sediment rain splash?

- Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters.
- Terrestrial plants may be exposed to particulates deposited on leaf and stem surfaces by rain striking contaminated sediments (i.e., rain splash) in an area that is only periodically inundated with water.
- Contaminants in sediment may partition into soil solution, making them available to roots.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Provide explanation: There are no aquatic environments present.

Question O:

Could contaminants interact with receptors through food web transport from water and sediment?

- The chemicals may bioconcentrate in food items.
- Animals may ingest contaminated food items.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments present.

Question P:

Could contaminants interact with receptors via ingestion of water and suspended sediments?

- If sediments are present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediments.
- Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments present.

Question Q:

Could contaminants interact with receptors through dermal contact with water and sediment?

- If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods.
- Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments present.

Question R:

Could contaminants interact with plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- Burial of contamination attenuates radiological exposure.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments present.

Question S:

Could contaminants bioconcentrate in free floating aquatic, attached aquatic plants, or emergent vegetation?

- Aquatic plants are in direct contact with water.
- Contaminants in sediment may partition into pore water, making them available to submerged roots.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants/Emergent Vegetation: 0

Provide explanation: There are no aquatic environments present.

Question T:

Could contaminants bioconcentrate in sedimentary or water column organisms?

- Aquatic receptors may actively or incidentally ingest sediment while foraging.
- Aquatic receptors may be directly exposed to contaminated sediments or may be exposed to contaminants through osmotic exchange, respiration, or ventilation of sediment pore waters.
- Aquatic receptors may be exposed through osmotic exchange, respiration, or ventilation of surface waters.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: There are no aquatic environments present.

Question U:

Could contaminants bioaccumulate in sedimentary or water column organisms?

- Lipophilic organic contaminants and some metals may concentrate in an organism's tissues
- Ingestion of contaminated food items may result in contaminant bioaccumulation through the food web.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: There are no aquatic environments present.

Question V:

Could contaminants interact with aquatic plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- The water column acts to absorb radiation, thus external irradiation is typically more important for sediment dwelling organisms.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

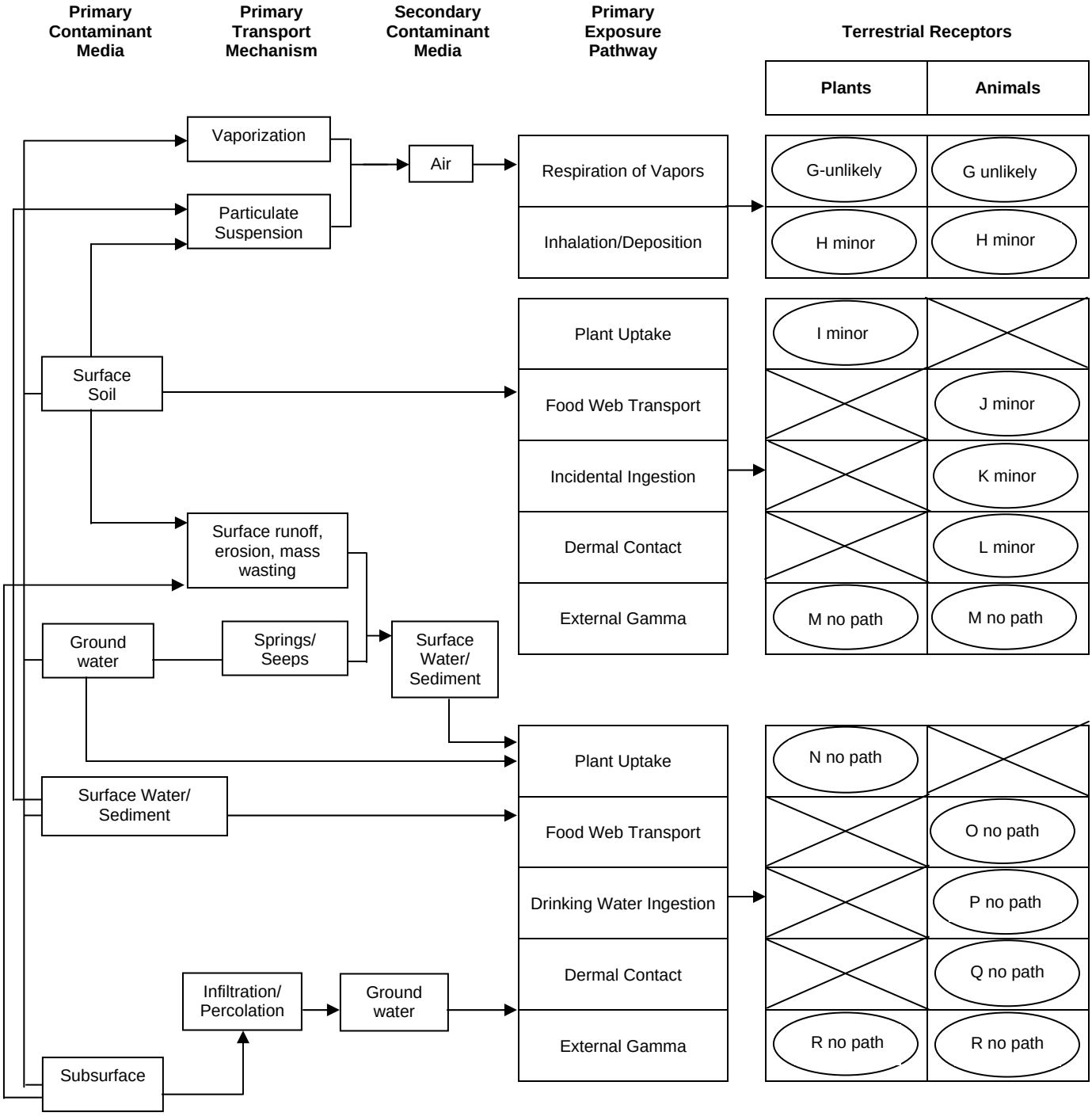
Aquatic Plants: 0

Aquatic Animals: 0

Provide explanation: There are no aquatic environments or gamma-emitting radionuclides present.

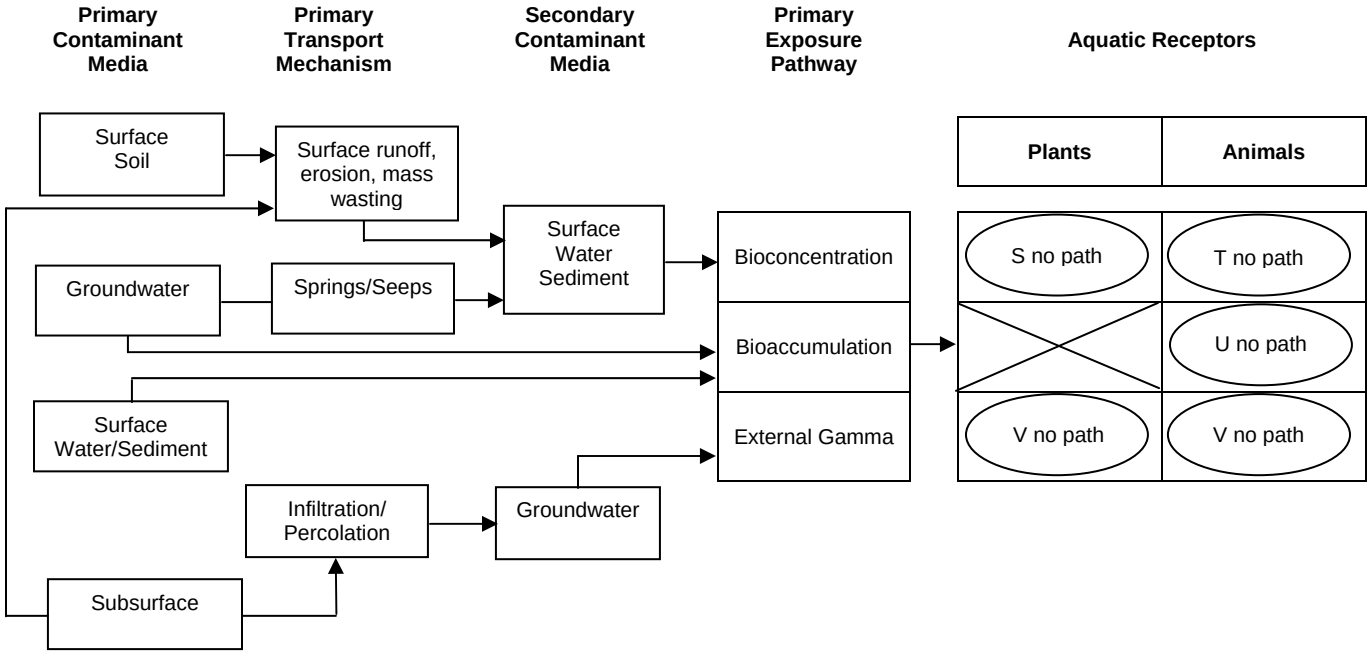
NOTE:
Letters in circles refer to questions on the Scoping Checklist

Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model



NOTE:
Letters in circles refer to questions on the Scoping Checklist

Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model



Signatures and certifications:

Checklist completed by (provide name, organization and phone number):

Name (printed): Tracy L. McFarland
Name (signature): Tracy L. McFarland
Organization: Los Alamos Technical Associates, Inc
Phone number: 505-662-1830
Date Completed: 05/23/2009

Verification by a member of ER Project Ecological Risk Task Team (provide name, organization and phone number):

Name (printed): Richard J. Mirenda
Name (signature): Richard J. Mirenda
Organization: Los Alamos National Laboratory
Phone number: 505-665-6953
Date Completed: 05/26/2009

G3-3.0 ECOLOGICAL SCOPING CHECKLIST FOR SWMU 41-001

Part A—Scoping Meeting Documentation

Site ID	**SWMU 41-001**
Form of site releases (solid, liquid, vapor). Describe all relevant known or suspected mechanisms of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential areas of release. Reference locations on a map as appropriate.	TA-41 is located in Los Alamos Canyon. SWMU 41-001 is a septic system that served a guardhouse from 1949 to 1953. Archival information from 1986 indicates that a septic tank at TA-41 was contaminated with plutonium, uranium, and tritium (Balo and Warren 1986, 007419, p. 61). It is not known if the septic tank referred to was the one that served the guardhouse another septic tank at TA-41. Therefore, the form of site releases would be liquid radioactive waste from leaks associated with the septic system. The potential areas of release are subsurface media in Los Alamos Canyon.
List of Primary Impacted Media **(Indicate all that apply.)**	**Surface soil –** Applicable **Surface water/sediment –** Applicable (Sediment) **Subsurface –** Applicable **Groundwater –** N/A **Other, explain –** None
FIMAD vegetation class based on Arcview vegetation coverage **(Indicate all that apply.)**	**Water –** N/A **Bare Ground/Unvegetated –** Applicable **Spruce/fir/aspen/mixed conifer –** N/A **Ponderosa pine –** Applicable **Piñon juniper/juniper savannah –** Applicable **Grassland/shrubland –** Applicable **Developed –** Paved Roads, buildings
Is T&E Habitat Present? **If applicable, list species known or suspected to use the site for breeding or foraging.**	Yes. SWMU 41-001 location information maintained by FIMAD is intersected with T&E species habitat using GIS databases. The site does have T&E Habitat present. These locations are within Mexican spotted owl nesting habitat and are within an area where the owl can conservatively be assumed to forage at a high frequency. SWMU 41-001 is entirely within an area where the peregrine falcon can conservatively be assumed to forage at a relatively high frequency (Gonzales 1999, 062925).
Provide list of Neighboring/ Contiguous/ Up-gradient sites, include a brief summary of COPCs and form of releases for relevant sites and reference map as appropriate. **(Use information to evaluate need to aggregate sites for screening.)**	TA-03, SWMU 00-017, TA-43, Los Alamos Medical Center, Former TA-01, and TA-41 are all neighboring, contiguous, and/or up-gradient sites from the SWMU 41-001. Releases from these sites include hazardous constituents and radionuclides in liquid, solid and vapor forms by several mechanisms including spills, dumping, material disposal, and outfall. The COPCs for the up-gradient sites include but are not limited to VOCs, SVOCs, inorganics, radionuclides, and metals.
Surface Water Erosion Potential Information	Run-on occurs from storms down the slope of Los Alamos Canyon. Run-off infiltrates into the shallow subsurface or moves as sheet flow.

Part B—Site Visit Documentation

Site ID	**41-001**
Date of Site Visit	**01/30/2009**
Site Visit Conducted by	**John Branch, Andrew Goumas, Tracy McFarland**

Receptor Information:

Estimate cover	Relative vegetative cover (high, medium, low, none) =medium Relative wetland cover (high, medium, low, none) = none Relative structures/asphalt, etc. cover (high, medium, low, none) = low
Field notes on the FIMAD vegetation class to assist in ground-truthing the Arcview information	The locations contain vegetation from the piñon-juniper zone and ponderosa pine zone. There is also secondary successional shrub and grass species resulting from the physical disturbances at TA-41.
Field notes on T&E Habitat, if applicable. Consider the need for a site visit by a T&E subject matter expert to support the use of the site by T&E receptors.	The area around SWMU 41-001 may provide foraging habitat for the Mexican spotted owl and the peregrine falcon. This portion of LA Canyon also potentially provides suitable nesting habitat for the Mexican spotted owl and is in the vicinity of nesting habitat for the peregrine falcon (Gonzales 1999, 062925).
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and make notes on the quality of habitat present at the site.**	Yes. There are plant and animal ecological receptors present at SWMU 41-001. The general types of receptors are terrestrial biota such as reptiles, small mammals, insects, birds, and plants. The area around SWMU 41-001 is developed, therefore, the quality of habitat for ecological receptors is not ideal although it is sustainable.

Contaminant Transport Information:

Surface water transport **Field notes on the erosion potential, including a discussion of the terminal point of surface water transport (if applicable).**	SWMU 41-001 contains some vegetation, which stabilizes the environmental medium at the site. There are also areas in and around SWMU 41-001 that consist of only fill material and short, spotty bunch grasses.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Yes. SWMU 41-001 has the potential for surface water transport off-site due to the physical location of the site.
Interim action needed to limit off-site transport? **(yes/no/uncertain)** **Provide explanation/ recommendation to project lead for IA SMDP.**	No. The levels of contaminants for SWMU 41-001 are low and there is no evidence of erosion at the site.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	SWMU 41-001 has a low to moderate amount of physical disturbance from the development of TA-41. This development includes paved roads, approx. 12' chain linked security fence, buildings and utilities. There is no evidence of erosion at the site.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	Yes. The physical disturbance of the area as a result of development within the TA.
Interim action needed to limit apparent ecological effects? **(yes/no/uncertain)** **Provide explanation and recommendations to mitigate apparent exposure pathways to project lead for IA SMDP.**	No. TA-41 remains active, the levels of contaminants are low, and there is no evidence of erosion at the site.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to offsite receptors, the remainder of the checklist should not be completed. Stop here and provide additional explanation/justification for proposing an ecological No Further Action recommendation (if needed). At a minimum, the potential for future transport should include likelihood that future construction activities could make contamination more available for exposure or transport. **Not applicable.**

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature, rate and extent of contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if the maximum value was captured by existing sample data.)**	Yes. Data collected during the investigation defined the nature and extent of contamination at this site.
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if other sites should aggregated to characterize potential ecological risk.)**	Yes. The data includes bounding samples to define the extent of contamination.

Part C—Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors via vapors?

- Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant $>10^{-5}$ atm-me/mol and molecular weight <200 g/mol).

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Volatile organic compounds were not detected in the 0-5 ft depth interval.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- Soil contamination would have to be on the actual surface of the soil to become available for dust.
- In the case of dust exposures to burrowing animals, the contamination would have to occur in the depth interval where these burrows occur.

Answer (likely/unlikely/uncertain): Likely

Provide explanation: The potential for dust entrainment is likely due to the low vegetation cover.

Question C:

Can contaminated soil be transported to aquatic ecological communities?

- If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no aquatic communities located within TA-41. There is also no evidence of erosion.

Question D:

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow groundwater?

- Known or suspected presence of contaminants in groundwater.
- The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.
- Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).
- Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no seeps or springs and no evidence of perched groundwater in the vicinity of TA-41. The depth to groundwater is greater than 1000 ft below ground surface.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- Suspected ability of contaminants to migrate to groundwater.
- The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.
- Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).
- Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Contaminants are unlikely to migrate to the regional aquifer given the depth to groundwater. The lack of a significant hydraulic driver (e.g., no ponded water on the surface) facilitating infiltration also mitigates the potential for contaminants reaching groundwater.

Question F:

Might erosion or mass wasting events be a potential release mechanism for contaminants from subsurface materials or perched aquifers to the surface?

- This question is only applicable to release sites located on or near the mesa edge.
- Consider the erodability of surficial material and the geologic processes of canyon/mesa edges.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: SWMU 41-001 is located on the canyon bottom where mass wasting is unlikely to occur. There is no evidence of erosion at the site.

Question G:

Could airborne contaminants interact with receptors through respiration of vapors?

- Contaminants must be present as volatiles in the air.
- Consider the importance of inhalation of vapors for burrowing animals.
- Foliar uptake of organic vapors is typically not a significant exposure pathway.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 1

Terrestrial Animals: 1

Provide explanation: No volatile organic compounds were detected in the 0-5 ft depth interval.

Question H:

Could airborne contaminants interact with plants through deposition of particulates or with animals through inhalation of fugitive dust?

- Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.
- Exposure via inhalation of fugitive dust is particularly applicable to ground-dwelling species that would be exposed to dust disturbed by their foraging or burrowing activities or by wind movement.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Terrestrial Animals: 2

Provide explanation: Vegetation may limit the amount of fugitive dust, although burrowing activities will expose dust to the surface.

Question I:

Could contaminants interact with plants through root uptake or rain splash from surficial soils?

- Contaminants in bulk soil may partition into soil solution, making them available to roots.
- Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Provide explanation: Low concentrations of contaminants were measured in surface and shallow subsurface samples.

Question J:

Could contaminants interact with receptors through food web transport from surficial soils?

- The chemicals may bioaccumulate in animals.
- Animals may ingest contaminated food items.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Concentrations of bioaccumulators were low and infrequently detected.

Question K:

Could contaminants interact with receptors via incidental ingestion of surficial soils?

- Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Surface and subsurface soil contamination is minor and concentrations are low.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

- Significant exposure via dermal contact would generally be limited to organic contaminants that are lipophilic and can cross epidermal barriers.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Lipophilic chemicals were detected infrequently and at low concentrations at this site.

Question M:

Could contaminants interact with plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- Burial of contamination attenuates radiological exposure.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 1

Terrestrial Animals: 1

Provide explanation: No gamma-emitting radionuclides were detected or detected above background/fallout.

Question N:

Could contaminants interact with plants through direct uptake from water and sediment or sediment rain splash?

- Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters.
- Terrestrial plants may be exposed to particulates deposited on leaf and stem surfaces by rain striking contaminated sediments (i.e., rain splash) in an area that is only periodically inundated with water.
- Contaminants in sediment may partition into soil solution, making them available to roots.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Provide explanation: There are no aquatic environments onsite.

Question O:

Could contaminants interact with receptors through food web transport from water and sediment?

- The chemicals may bioconcentrate in food items.
- Animals may ingest contaminated food items.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question P:

Could contaminants interact with receptors via ingestion of water and suspended sediments?

- If sediments are present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediments.
- Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question Q:

Could contaminants interact with receptors through dermal contact with water and sediment?

- If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods.
- Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question R:

Could contaminants interact with plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- Burial of contamination attenuates radiological exposure.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question S:

Could contaminants bioconcentrate in free floating aquatic, attached aquatic plants, or emergent vegetation?

- Aquatic plants are in direct contact with water.
- Contaminants in sediment may partition into pore water, making them available to submerged roots.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants/Emergent Vegetation: 1

Provide explanation: There are no aquatic environments onsite.

Question T:

Could contaminants bioconcentrate in sedimentary or water column organisms?

- Aquatic receptors may actively or incidentally ingest sediment while foraging.
- Aquatic receptors may be directly exposed to contaminated sediments or may be exposed to contaminants through osmotic exchange, respiration, or ventilation of sediment pore waters.
- Aquatic receptors may be exposed through osmotic exchange, respiration, or ventilation of surface waters.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question U:

Could contaminants bioaccumulate in sedimentary or water column organisms?

- Lipophilic organic contaminants and some metals may concentrate in an organism's tissues
- Ingestion of contaminated food items may result in contaminant bioaccumulation through the food web.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: Contaminants are not located within the stream channel.

Question V:

Could contaminants interact with aquatic plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- The water column acts to absorb radiation, thus external irradiation is typically more important for sediment dwelling organisms.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

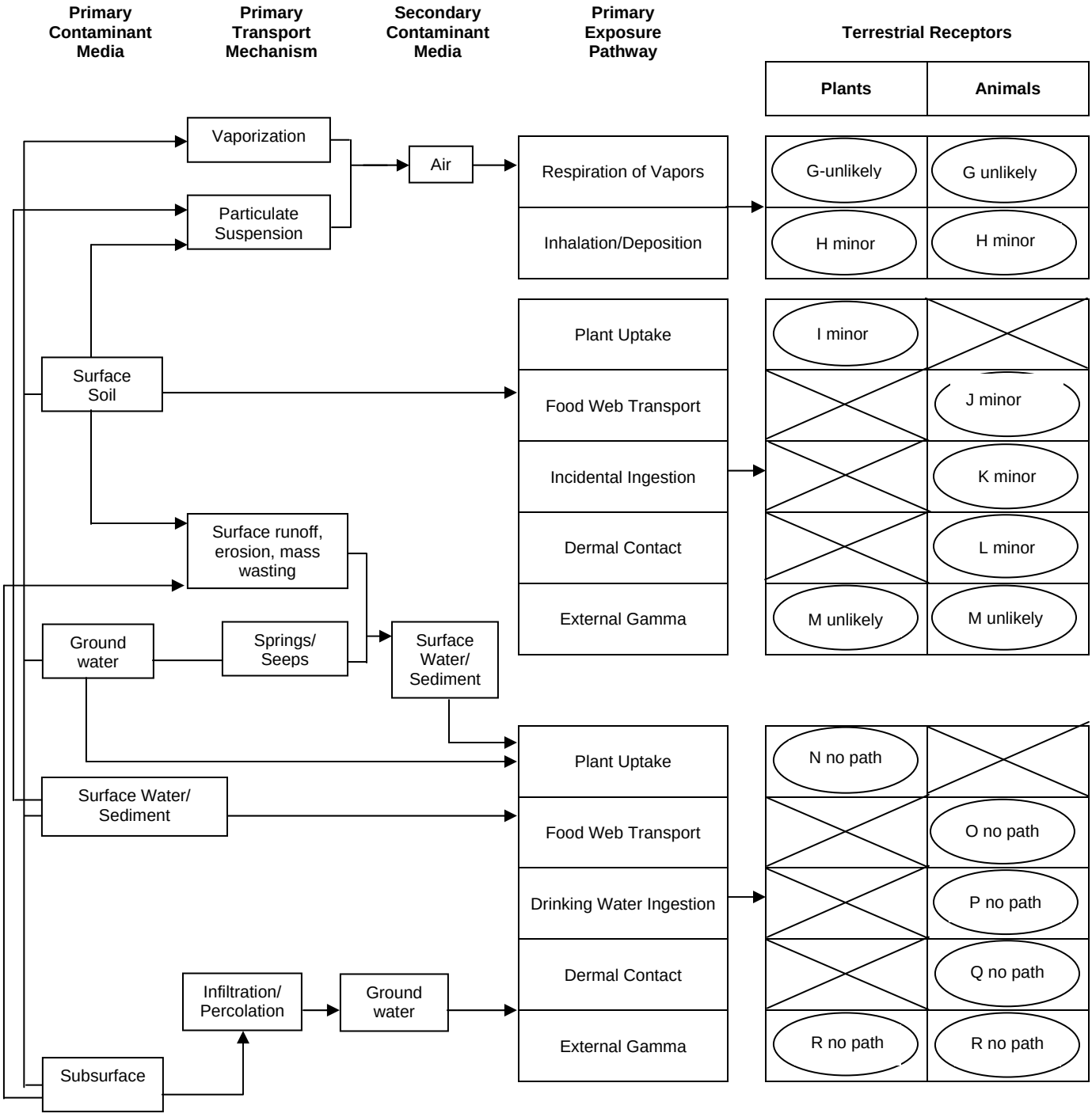
Aquatic Plants: **1**

Aquatic Animals: 1

Provide explanation: There are no aquatic environments onsite.

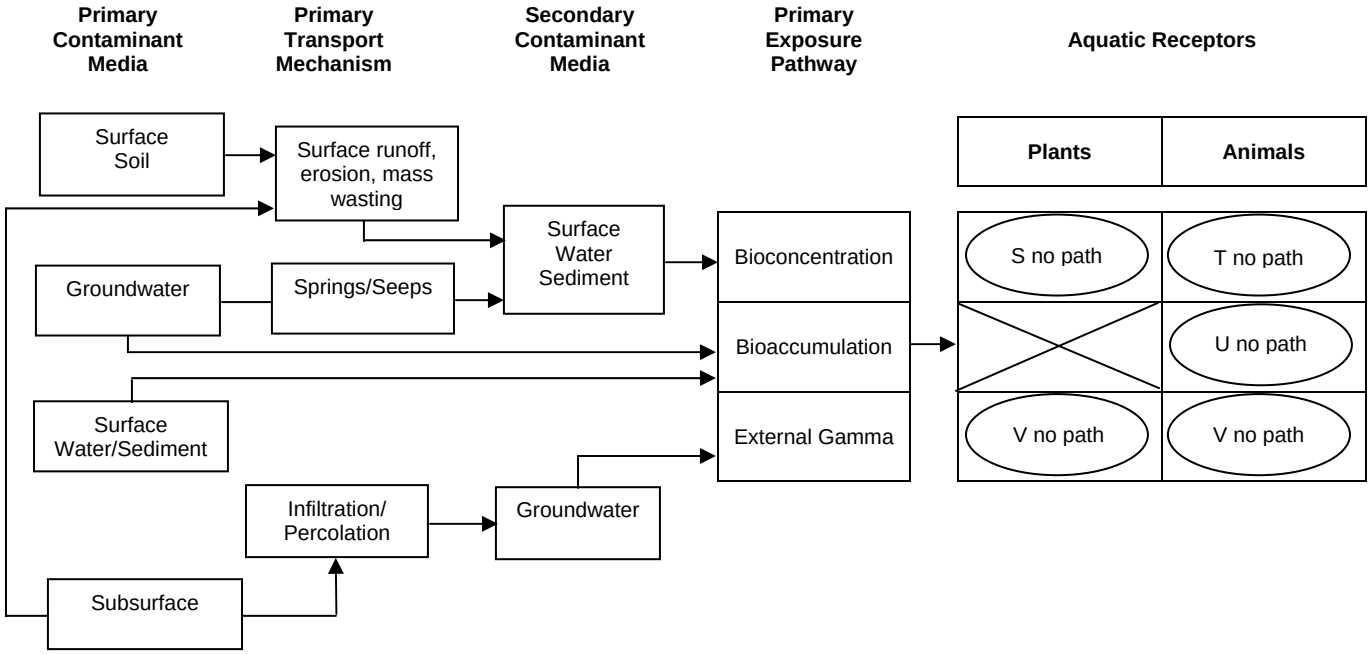
NOTE:
Letters in circles refer to questions on the Scoping Checklist

Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model



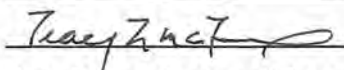
NOTE:
Letters in circles refer to questions on the Scoping Checklist

Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model

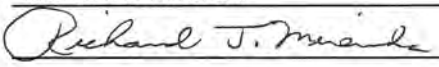


Signatures and certifications:

Checklist completed by (provide name, organization and phone number):

Name (printed): Tracy L. McFarland
Name (signature): 
Organization: Los Alamos Technical Associates, Inc
Phone number: 505-662-1830
Date Completed: 05/23/2009

Verification by a member of ER Project Ecological Risk Task Team (provide name, organization and phone number):

Name (printed): Richard J. Mirenda
Name (signature): 
Organization: Los Alamos National Laboratory
Phone number: 505-665-6953
Date Completed: 05/26/2009

Appendix H

Investigation-Derived Waste Management

H-1.0 INTRODUCTION

This appendix contains the waste management records for the investigation-derived waste (IDW) generated during the implementation of the investigation work plan for the Upper Los Alamos Canyon Aggregate Area at Technical Area 00 (TA-00), former TA-01, TA-03, former TA-32, TA-41, TA-43, and TA-61 of Los Alamos National Laboratory (LANL or the Laboratory).

All IDW generated during the field investigation was managed in accordance with standard operating procedure (SOP) EP-ERSS-SOP-5022, Characterization and Management of Environmental Restoration (ER) Project Waste. This procedure incorporates the requirements of all applicable U.S. Environmental Protection Agency (EPA) and New Mexico Environment Department (NMED) regulations, U.S. Department of Energy (DOE) orders, and Laboratory implementation requirements.

Consistent with Laboratory procedures, a waste characterization strategy form (WCSF) was prepared to address characterization approaches, on-site management, and final disposition options for wastes. Information from previous investigation wastes and analytical data and/or acceptable knowledge (AK) were used to complete the WCSF. The WCSF is included as Attachment H-1.

The selection of waste containers was based on appropriate U.S. Department of Transportation requirements, waste types, and estimated volumes of IDW to be generated. Immediately following containerization, each waste container was individually labeled with a unique identification number and with information regarding waste classification, contents, radioactivity, and date generated.

Wastes were staged in clearly marked and appropriately constructed waste accumulation areas. Waste accumulation area postings, regulated storage duration, and inspection requirements were based on the type of IDW and its classification. Container and storage requirements were detailed in the WCSF and approved before waste was generated.

Investigation activities were conducted in a manner that minimizes the generation of waste. Waste minimization was accomplished by implementing the most recent version of the “Los Alamos National Laboratory Hazardous Waste Minimization Report” (LANL 2008, 104174).

H-2.0 WASTE STREAMS

The IDW streams that were generated and managed during the investigation of Upper Los Alamos Canyon Aggregate Area are described below and summarized in Table H-2.0-1.

- *WCSF Waste #1:* Municipal solid waste (MSW) consists of noncontact trash and debris and empty sample preservation containers. The MSW was determined to be nonhazardous and nonradioactive. It was stored in plastic-lined trash cans and disposed of at the Los Alamos County landfill.
- *WCSF Waste #2:* This waste stream includes soil and tuff cuttings from boreholes. Approximately 10 yd^3 of cuttings was stored in lined 55-gal. drums within appropriate waste staging areas. All drums were directly sampled and were determined to be nonhazardous low-level waste (LLW) or industrial waste. All drill cuttings will be disposed of at an authorized treatment, storage, and disposal (TSD) facility.
- *WCSF Waste #3:* Excavated metals, concrete, and asphalt. This waste stream includes materials excavated or removed during the site investigation. Included are an excavated cast-iron pipe from Solid Waste Management Unit (SWMU) 01-001(d) and concrete and asphalt debris from cutting

access holes in pavement. Approximately 6 yd^3 of debris was generated and collected at the point of generation. These wastes were characterized based on acceptable knowledge of processes associated with the debris, from site characterization sampling, or by direct sampling. They were determined to be LLW and will be disposed of at an authorized TSD facility. The excavated cast-iron pipe was swiped and determined to be nonradioactive. The excavated pipe meets release criteria and will be recycled through the Laboratory's recycling program.

- *WCSF Waste #4:* This waste stream includes spent personal protective equipment (PPE), material used in dry decontamination of sampling equipment (e.g., paper towels), and plastic bags. These wastes were containerized at the point of generation and were characterized based on acceptable knowledge (AK) of the waste materials and the methods of generation or from site-characterization sampling. These wastes were managed as hazardous or non hazardous depending on the contaminants expected at the SWMUs or areas of concern from which they were generated. Approximately 0.3 yd^3 of contact waste was generated and will be disposed of as MSW through the "Green is Clean" program. If the waste does not pass the green is clean criteria, it will be disposed of as LLW at an authorized off-site TSD facility.
- *WCSF Amendment #2:* This waste steam includes excavated soil and fill material from SWMU 01-001(d). Approximately 10 $yd^3$of material was generated and containerized in a 20-yd^3 rolloff container at the point of generation. The waste was characterized by direct sampling and was determined to be LLW. The waste is currently being stored in a radioactive waste storage area. All excavated soil will be disposed of at an authorized TSD facility.

H-3.0 REFERENCES

The following list includes all documents cited in this appendix. 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.

LANL (Los Alamos National Laboratory), November 2008. "Los Alamos National Laboratory Hazardous Waste Minimization Report," Los Alamos National Laboratory document LA-UR-08-7274, Los Alamos, New Mexico. (LANL 2008, 104174)

Table H-2.0-1
Summary of IDW Generation and Management

Waste Stream	Waste Type	Volume	Characterization Method	On-Site Management	Disposition
MSW	Nonhazardous/ Nonradioactive	2 yd^3	AK	Plastic bags	County of Los Alamos landfill
Drill cuttings	LLW, industrial	10 yd^3	Direct sampling	55-gal. drums	Pending disposal at TA-54 Area G or at Energy Solutions, Clive, Utah
Concrete, gravel, asphalt, debris, and metal pipe	LLW, recyclable	6 yd^3	AK and direct sampling	Rolloff container, 55-gal. drum	Pending disposal of LLW at TA-54 Area G or at Energy Solutions, Clive, Utah; metal pipe will be recycled by Laboratory
Contact waste	Green is Clean or LLW	0.3 yd^3	AK and analytical results of site characterization	30-gal. drums	Pending disposal at County of Los Alamos landfill or at TA-54 Area G or at Energy Solutions, Clive, Utah
Excavated soil	LLW	10 yd^3	Direct sampling	Rolloff bin	Pending disposal at TA-54 Area G or at Energy Solutions, Clive, Utah

Attachment H-1

Waste Characterization Strategy Form and Amendment
(on DVD included with this document)