LA-UR-09-5314
September 2009
EP2009-0371

Investigation Report for North Ancho Canyon Aggregate Area

Los Alamos
NATIONAL LABORATORY
EST. 1943

Prepared by the Environmental Programs Directorate

LA-UR-09-5314
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EXECUTIVE SUMMARY

The Los Alamos National Laboratory (LANL or the Laboratory) has investigated the North Ancho Canyon Aggregate Area located in North Ancho Canyon within Laboratory property. The North Ancho Canyon Aggregate Area includes 44 individual solid waste management units (SWMUs) and areas of concern (AOCs). The sites included in this investigation report are SWMU 39-001(a), SWMU 39-001(b), SWMU 39-002(a), AOC 39-002(b), AOC 39-002(c), AOC 39-002(f), SWMU 39-004(c), SWMU 39-004(d), SWMU 39-005, SWMU 39-006(a) inactive components, SWMU 39-007(a), AOC 39-007(d), SWMU 39-008, and SWMU 39-010. Four active sites [SWMUs 39-004(c), 39-004(d), 39-008, and 39-006(a) active components] are included for preliminary characterization only because these sites are impacted by continuing site operations. In addition, the results of the investigation of potential contamination of canyon alluvial sediment outside and downgradient of the North Ancho Canyon Aggregate Area within the ephemeral stream channel (the extended drainages) are included in this investigation report.

The investigation conducted in 2009 included surface and subsurface sampling of 11 SWMUs and AOCs and remediation and confirmatory sampling of 3 SWMUs. SWMUs 39-001(a), 39-001(b) and 39-006(a) (only the inactive septic system components) were excavated until analytical results of confirmatory samples from the walls and the base of the excavations were below industrial soil screening levels and screening action levels, after which the areas were backfilled with clean material. Excavated material was segregated for disposal, and only clean soil was returned to backfill the excavated sites.

Data collected postremediation and during characterization were used to evaluate the potential risks and doses at the sites. The risks were less than the New Mexico Environment Department (NMED) target level of 1×10^{-5}, and the hazard indexes (HIs) were below the NMED target HI of 1.0 for the industrial and residential scenarios at SWMUs 39-002(a) Area 3, 39-005, 39-006(a) active components, and 39-010 as well as at AOCs 39-002(c), 39-002(f), and 39-007(d). The risks were less than the NMED target levels for the residential scenario at SWMUs 39-001(b) and 39-006(a) inactive components. The risks were also less than the NMED target levels for the recreational and residential scenarios in the extended drainages. Total doses for all scenarios and all sites were below the U.S. Department of Energy target dose of 15 mrem/yr. SWMUs 39-002(a) Area 1 and 39-007(a) had potential unacceptable risks for the industrial and residential scenarios primarily from polycyclic aromatic hydrocarbons and polychlorinated biphenyls, respectively. There were no unacceptable ecological risks at these sites.

SWMUs 39-001(b) and 39-005 and AOCs 39-002(c), 39-002(f), and 39-007(d) are recommended for corrective action complete without controls (i.e., they meet cleanup goals for the residential scenario). SWMUs 39-002(a) Area 3 and 39-006(a) inactive components do not require any additional corrective actions but must wait for the completion of corrective actions for the remainder of the SWMU before recommendation of corrective action complete for the entire SWMU can be made. Phase II remediation activities at SWMU 39-001(a) are ongoing, and an addendum to this investigation report will be submitted when they are completed. Additional remediation and sampling are recommended for SWMUs 39-010, 39-002(a) Area 1, and 39-007(a). SWMU 39-002(b) is also recommended for characterization. Preliminary characterization of the active sites and the extended drainages is complete and demonstrates that current activities are not contributing to off-site migration of contaminants. Therefore, it is recommended that further investigation of the active sites [SWMUs 39-004(c), 39-004(d), 39-006(a) (active components), and 39-008] be delayed until operations at these sites cease. It is also recommended that characterization of SWMU 39-002(a) Area 2, an indoor storage area, be delayed until operations cease.

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1.0 INTRODUCTION

1.1 General Site Information

Los Alamos National Laboratory (LANL or the Laboratory) is a multidisciplinary research facility owned by the U.S. Department of Energy (DOE) and managed by Los Alamos National Security, LLC. The Laboratory is located in north-central New Mexico, approximately 60 mi northeast of Albuquerque and 20 mi northwest of Santa Fe. The Laboratory covers 40 mi^2 of the Pajarito Plateau, which consists of a series of fingerlike mesas separated by deep canyons containing perennial and ephemeral streams running from west to east. Mesa tops range in elevation between 6200 and 7800 ft above mean sea level (amsl).

This investigation report describes investigation and cleanup activities for the North Ancho Canyon Aggregate Area implemented to meet requirements of the March 1, 2005, Compliance Order on Consent (the Consent Order). The North Ancho Canyon Aggregate Area includes Technical Area 39 (TA-39) and portions of TA-49 (Figure 1.1-1). The TA-49 sites are addressed in separate work plans and investigation reports. Table 1.1-1 identifies the solid waste management units (SWMUs) and areas of concern (AOCs) in the North Ancho Canyon Aggregate Area and their status. Plate 1 shows the location of the North Ancho Canyon Aggregate Area. Topographically, the area consists of the alluvial floodplain and hill slopes of North Ancho Creek, an ephemeral stream. Plate 1 also shows the topography of TA-39. The North Ancho Canyon Aggregate Area is primarily composed of firing sites for testing of high explosives (HE) and associated support facilities and waste disposal areas. Active facilities include firing sites, storage areas, administrative offices, workshops, sewage disposal facilities, and supporting infrastructure. Inactive facilities include firing sites, storage areas, waste disposal areas, and sewage and chemical disposal facilities. The North Ancho Canyon Aggregate Area boundary and the SWMUs and AOCs included in this investigation report are also shown on Plate 1.

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 U.S. Department of Energy (DOE) policy.

1.2 Investigation Overview (Purpose and Scope)

1.2.1 Investigation Activities

The sites included in this investigation report for characterization are SWMU 39-002(a), AOC 39-002(b), AOC 39-002(c), AOC 39-002(f), SWMU 39-004(c), SWMU 39-004(d), SWMU 39-005, SWMU 39-006(a) active components, SWMU 39-007(a), AOC 39-007(d), SWMU 39-008, and SWMU 39-010. These sites have undergone sampling to determine the nature and extent of contaminants as well as the potential risks to human health and the environment associated with the concentrations of contaminants at the sites. The sampling included surface and subsurface soil samples. Groundwater investigation lies outside the scope of this investigation report. Surface water was also not sampled for this investigation report, but the results of surface-water samples collected at the Federal Facilities Compliance Agreement stormwater monitoring locations (superseded by the National Pollutant Discharge Elimination System [NPDES] Individual Permit, April 1, 2009) and the two permanent gaging stations at the lower end of the canyon are provided on the data DVDs included in Appendix F.

Three active sites [SWMUs 39-004(c), 39-004(d), and 39-008] are also included in this investigation report for preliminary characterization although these sites are impacted by continuing site operations. The active sites are included to determine the potential contaminants being released at the sites and

whether these contaminants are migrating off the site. In addition, the results of the investigation of potential contamination of canyon alluvial sediment outside and downgradient of the North Ancho Canyon Aggregate Area within the ephemeral drainage channel (the extended drainages) are included in this investigation report. The drainage is sampled to determine if contaminants are migrating off the individual SWMUs and AOCs and if those contaminants are migrating down the canyon during periods of surface water flow.

Two former satellite accumulation areas (SAAs) [AOCs 39-002(d) and 39-002(e)] regulated under 40 Code of Federal Regulations (CFR) 262 and 20.4.1 New Mexico Administrative Code were not investigated because they were not used for any other operations before or after their installation as SAAs. Because of the prescribed regulations applicable to SAAs, they are recommended for corrective action complete without controls.

1.2.2 Remediation Activities

Remedial actions were performed at SWMUs 39-001(a), 39-001(b), and 39-006(a). Remedial activities consisted of excavating waste material from SWMUs 39-001(a) and 39-001(b) and from inactive subsurface structures [including waste lines, septic tanks, a seepage pit, and sand filter at SWMU 39-006(a)]. SWMUs 39-001(b) and 39-006(a) were backfilled after confirmatory sampling results determined that concentrations of COPCs at the base and walls of the excavation were below industrial soil screening levels (SSLs) (NMED 2009, 106420) and screening action levels (SALs) (LANL 2005, 088493). Backfilling of SWMU 39-001(a) is pending review of additional confirmation sampling results.

1.3 North Ancho Canyon Aggregate Area Sites Not Included in Report

The following sites are not discussed in this investigation report:

- 2 sites removed from Module VIII of the Laboratory's Hazardous Waste Facility Permit by NMED [SWMUs 39-003 and 39-006(b)] (NMED 1998, 063042; NMED 2001, 070010). Five sites with no further action (NFA) approval by the U.S. Environmental Protection Agency (EPA) [AOCs 39-002(g), 39-007(b), 39-007(c), 39-007(e), and 39-009] (EPA 2005, 088464);
- 3 sites deferred from investigation pursuant to Table IV-2 of the Consent Order [SWMUs 39-004(a), 39-004(b), and 39-004(e)]; and
- 18 TA-49 sites addressed in separate work plans and investigation reports.

1.4 Document Organization

Section 1.0 of this report presents introductory information; section 2.0 provides the scope of the activities conducted during the 2009 sampling and remediation work. Section 3.0 provides the field-investigation results and conditions encountered at the sites, and section 4.0 covers the regulatory criteria. The background, historical sampling, summary of sampling results, and the human health and ecological risk assessments are presented in section 5.0. Section 6.0 provides the conclusions for the investigation, section 7.0 presents the recommendations for each site, and section 8.0 provides the references and the map data sources. The appendixes present the acronyms and abbreviations, metric conversion table, and data qualifier definitions used in this report (Appendix A); the data evaluation (Appendix B); field methods (Appendix C); results of the field screening (Appendix D); analytical program and data (Appendixes E and F); waste management (Appendix G); and human health and ecological risk assessments (Appendix H).

2.0 SCOPE OF ACTIVITIES

2.1 Geodetic Surveys

Geodetic surveys of sampling locations and site features were performed using a Trimble VX total station and a combination of real-time kinematic and postprocessed differential global-positioning system units. The laser scanning functionality of the Trimble VX was used during surveys of excavations at SWMUs 39-001(a), 39-001(b), and 39-006(a) inactive components to capture accurate, high-resolution data to document the boundaries and morphology of disposal units or excavation. During sampling at SWMUs 39-001(a) and 39-001(b), field personnel used the total station in direct-reflex mode to remotely stake out predetermined sampling locations for heavy-equipment operators collecting sample media. Surveyed coordinates for sampling locations are maintained in the Sample Management Database, and SWMU and AOC boundaries are maintained in the Environmental Programs Directorate geographic information system. Final boundaries for excavations are documented in Green (2009, 106947).

2.2 Radiological Walk-Over Surveys

Radiological walk-over surveys were conducted at SWMU 39-001(b) to ensure the field-screening trailer and the lay-down area were not placed in a contaminated area. Surveys were also conducted periodically during backfill operations to ensure the path of delivery trucks was free of radiological contaminants.

2.3 Excavation

2.3.1 Exploratory Trenching

Seven exploratory trenches were dug at various locations within SWMU 39-001(a) to locate waste. Exploratory trenches were excavated within the SWMU 39-001(a) boundaries shown in Figure 2.3-2 of the approved investigation work plan for North Ancho Canyon (LANL 2007, 101894; NMED 2007, 098948) and the perceived boundary determined by directional boreholes at the site. After waste was identified, further excavation continued from the point of the exploratory trench. Trenches were dug to an average depth of 12 ft to ensure that no waste was present.

2.3.2 Excavation Methodology

2.3.2.1 Equipment Used

Initially, a tracked excavator was used to remove overburden and waste. The pit contents were transferred to a front-end loader, a backhoe, or a dump truck. The contents were then placed in the appropriate pile, shaped, and high-piled by the loader. The boundary of the pile was lined with silt fence and/or wattles to preclude potential run-on and runoff. Gorilla Snot was used to secure debris and reduce wind and water erosion from the pile (section 3.6 discusses the waste stockpiles).

2.3.2.2 Stop Excavation Criteria

Excavation continued in a given location within the site until

- waste was no longer present at that location and
- changes in the medium encountered indicated no previous excavation had taken place in that location.

Confirmation samples were then collected at the sides and base of the trench (as described in subsequent sections) and submitted to an off-site laboratory. The results were compared against industrial SSLs (NMED 2009, 106420) and SALs (LANL 2005, 088493) to determine if additional excavation was required.

2.4 Surface Sampling of Soil

Where conditions allowed, surface soil or sediment samples were collected using the spade-and-scoop method. At some locations where surface soil was too compacted, soil was collected using the hand-auger method. Sample collection methods were noted in the applicable sample collection logs (SCLs).

All the samples were field screened for the contaminants expected at each site. Off-site laboratory analysis was conducted on samples collected at 30% of the locations selected at random, as described below. Random selection of locations ensures that statistical analyses can be done on the off-site laboratory results to assess contamination at the sites and to correlate the field-screening results with results from the off-site analytical laboratory. The locations were selected at random before field screening was conducted for each site. The selection was done by randomly choosing 30% of the locations and including samples from the selected locations for laboratory analysis.

2.5 Subsurface Sampling

2.5.1 Hand Auger

When conditions did not allow using the spade-and-scoop method, hand augering was used to collect samples at depths below the ground surface. Given the depth of the sediment at most locations at the extended drainage, samples were collected using the spade-and-scoop method. Sample collection methods were noted in the applicable SCL.

2.5.2 Backhoe-Mounted Auger

Samples at SWMU 39-005 were collected to 10 ft bgs using a 5-in.-diameter power auger, a type of backhoe attachment. The power auger was used to dig down to the desired top depth, at which point an extended hand auger was used to collect the sample. After the desired bottom depth was reached with the hand auger, the power auger was used to reach the next sample's top depth. Depths were verified using a tape measure.

2.5.3 Sampling beneath Asphalt

When sampling locations were obstructed by asphalt, a digging bar was used to punch a hole large enough for the hand auger to collect a sample of the matrix beneath the asphalt. The auger was then used to remove asphalt debris until only the sample medium remained. Sampling depths recorded included a 0.5-ft addition in depth because of the thickness of the asphalt, and it was noted in the SCL that the sample was collected beneath asphalt. After samples were collected, the holes were abandoned by filling with bentonite to within 2 ft of the surface, backfilled with the excess soil, and covered with the asphalt debris. Sites where asphalt was removed include AOCs 39-002(f), 39-002(c), and 39-007(d) and SWMU 39-002(a) Areas 1 and 3. [SWMU 39-002(a) Area 1 was only partially covered by asphalt.] At this time, because of continued operations on-site, asphalt repair has not been completed. Once backfilling is completed, the asphalt will be patched using appropriate asphalt-maintenance materials.

2.5.4 Postexcavation Confirmation Sampling

Locations on the walls and floor of excavated pits were surveyed using a Trimble VX total station in direct-reflex mode with local control set by global positioning system. Any staining or remaining waste was used as the basis for continued excavation. Pit samples were collected using the track-hoe excavator bucket. Rim samples were collected using the bucket to scrape down the rim to the correct depth. Samples were collected from the excavator bucket.

2.6 Field Screening for Polychlorinated Biphenyls

In accordance with the approved investigation work plan (LANL 2007, 101894; NMED 2007, 098948), samples from four sites were screened for polychlorinated biphenyls (PCBs). The sites included SWMUs 39-010, 39-007(a), 39-006(a), and the extended drainages. A total of 527 samples were screened using the RaPID Assay PCB test kit from Strategic Diagnostics, Inc. (SDI). The samples were first extracted using the appropriate SDI sample extraction kit. The RaPID assay kit applies the principles of enzyme-linked immunosorbent assay to determine the PCBs and related compounds. The range of detection in soil for the kit is 0.5 ppm to 10 ppm (measured as Aroclor-1254). The minimum detection limit (DL) is 0.20 ppm. An RPA-II Photometric Analyzer spectrophotometer was used to interpret the results relative to the standard curve generated from the kit standards.

Samples from each of the four sites were screened and, as proposed in the approved investigation work plan (LANL 2007, 101894; NMED 2007, 098948), were retained. Sample containers were marked with a date, and holding times were observed. Samples were screened and stored inside a temperature-controlled field trailer. For any sample that resulted in a PCB detect, a full-suite sample was collected from the location and submitted to an off-site laboratory.

2.7 Field Screening for Hexahydro-1,3,5-trinitro-1,3,5-triazine and 2,4,6-Trinitrotoluene

Samples from five sites were screened for 2,4,6-trinitrotoluene (TNT) and hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) in accordance with the approved investigation work plan (LANL 2007, 101894; NMED 2007, 098948). The sites included SWMUs 39-007(a), 39-005, 39-002(a) Area 1, 39-006(a), and the extended drainages. A total of 599 samples were screened using the TNT/RDX EnSys soil test systems from SDI. The TNT test kits were used in conjunction with the RDX test kits. The samples were extracted once and used for both analyses. The HACH DR/2010 spectrophotometer was used to analyze the samples.

The detection range of the test kits were between 1 ppm and 30 ppm for RDX and TNT. The minimum detection level for the test kits was 0.7 ppm for TNT and 0.8 ppm for RDX. All samples with detects for explosives were submitted for a full-suite analysis at off-site fixed laboratories.

2.8 Field Screening for Metals by X-Ray Fluorescence

Samples from five sites were field screened for metals with the Niton XL3p 600 x-ray fluorescence (XRF) analyzer, a portable device widely used to identify and quantify the presence of metals in a given medium. The sites screened included SWMUs 39-010, 39-002(a) Area 1, 39-007(a), 39-006(a), and the extended drainages. A total of 638 samples were screened for metals.

The XRF analyzer was operated according to the manufacturer's specifications, including manuals and manufacturer-directed training. To obtain the most accurate data and in accordance with manufacturer recommendations, the ex situ sample cup method was consistently used for all samples. This method

involves homogenizing, sieving, and containerizing the sample media. A calibration was performed daily according to manufacturer recommendations. Also, specific manufacturer-supplied standards were used to ensure proper calibration.

The metals measured by XRF at the North Ancho Canyon sites included molybdenum, zirconium, strontium, uranium, rubidium, thorium, lead, selenium, arsenic, mercury, zinc, tungsten, copper, nickel, cobalt, iron, manganese, chromium, vanadium, titanium, scandium, calcium, potassium, sulfur, barium, cesium, tellurium, antimony, tin, cadmium, silver, and palladium. Because the XRF results are not directly comparable to analytical background values (BVs), the samples with the highest 25% of detected concentrations were selected for off-site laboratory analysis based on historical chemicals of potential concern (COPCs) (if available), on operational processes, expected COPCs, or the most elevated concentrations above BV. The following metals were used for determining sample collection at each site:

- SWMU 39-002(a) Area 1: copper, lead, and uranium (based on historical data)
- SWMU 39-006(a) Sand Filter: silver, uranium, cesium, and barium
- SWMU 39-007(a): zinc (based on historical data)
- SWMU 39-010: uranium, lead, and zinc
- The extended drainages: uranium, arsenic, copper, and chromium

2.9 Chemical and Radiological Analyses at Off-Site Laboratory

2.9.1 Sample Collection

Samples collected were immediately screened for radiation by the radiological controls technician and then screened for volatile organic compounds (VOCs) using a sample bottle sealed with aluminum foil. The samples were then placed in appropriate sample bottles obtained from the Laboratory's Sample Management Office (SMO). After the samples were bottled, labeled, recorded in the SCL, and sealed for custody, the completed sample kits were placed in a cooler with blue ice and taken to the SMO at the end of each day to be shipped off-site. (Appendix F includes chain-of-custody forms.) Samples were rarely held overnight. In such cases, coolers were packed full to capacity and stored in a locked bay.

Dioxins/furans were analyzed for each site based on field-screening results. The sample with the highest photoionization detector reading from a site was used for analyses of dioxin and furans. When no photoionization detector readings were elevated, the dioxin/furan sample was taken from the sample with highest field-screening result for another organic chemical (PCBs or explosives).

2.9.2 Analytical Suites

Analytical suites varied from site to site. More information on samples collected and analyses requested is presented for specific sites in tables provided in Appendix B. General analytical suites requested included pH, anions (including nitrates), cyanide, target analyte list (TAL) metals, perchlorate, explosives compounds, VOCs, semivolatile organic compounds (SVOCs), PCBs, dioxins/furans, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, americium-241, and tritium.

2.10 Deviations from the Approved Investigation Work Plan

2.10.1 AOC 39-002(f)

All sampling locations at AOC 39-002(f) were moved because a concrete pad and the building foundation footing impeded sampling. Sampling locations were moved away from the building, and some were sited

next to the concrete pad. The final sampling locations are shown on maps associated with site descriptions in section 5.

- Locations 39-604512 and 39-604513 were moved 4 ft east-southeast
- Location 39-604514 was moved 6.75 ft east-northeast
- Location 39-604515 was moved 3 ft east-southeast
- Location 39-604516 was moved 4 ft northeast.

2.10.2 SWMU 39-002(a) Area 1

Location 39-604805 was moved approximately 6 in. south because it was under an air-conditioning unit.

Samples were not collected at field-screening locations 130 and 118 because they were directly under the concrete walkway between buildings 39-2 and 39-62. Moving them to allow for sampling would have put them in close proximity to neighboring samples.

Between buildings 39-2 and 39-62, construction materials were stored along the north wall of building 39-2, and the original location was under these materials. Therefore, location 39-604811 was moved 1.3 ft north.

Because of the concrete foundation footing of building 39-2, field-screening location 137 had refusal for the bottom two depths, and samples were not collected. Also because of the footing, locations 138 (field screening) and 139 (location 39-604813) had refusal at bottom depths and samples were not collected. The final sampling locations are shown on maps associated with site descriptions in section 5.

2.10.3 SWMU 39-002(a) Area 2

Wipe samples at SWMU 39-002(a) Area 2 were not collected. This site is a former indoor SAA and the room is currently in use. New flooring has been installed over the original floor on which the SAA was situated. The original flooring is now inaccessible.

2.10.4 SWMU 39-006(a) Inactive Components

The sewer line from the manhole east of the inactive septic tank was discovered to be active from the manhole to the active sand filter. Therefore, it was not removed.

The confirmatory sampling locations for the inactive septic tank, seepage pit, and sand filter were determined by the orientation of the footprints of these features, which varied from the footprints shown in Figure 4.19-1 of the approved investigation work plan (LANL 2007, 101894, p. 138). As a result, confirmatory samples were not collected in the locations indicated in the investigation work plan (LANL 2007, 101894). However, the samples were located in the same configuration within the footprints of these features. The final sampling locations are shown on maps associated with site descriptions in section 5.

2.10.5 SWMU 39-006(a) Active Components

Influent and effluent samples for the active septic tank and the active sand filter were not collected because sampling would disrupt the lines of an active septic system currently in use.

2.10.6 AOC 39-002(b)

The sampling locations at AOC 39-002(b) were beneath a concrete pad, directly outside of the door to building 39-06. No samples were collected at this location because the use of mechanical tools would disrupt operations at the adjacent active firing site. An attempt was made to punch through the concrete pad, but the pad was too substantial to allow for sample collection with hand tools.

2.10.7 AOC 39-002(c)

Location 39-604746 was moved 1.75 ft south because of its proximity to an underground power line. The final sampling location is shown on maps associated with site descriptions in section 5.

2.10.8 SWMU 39-010

A sample was not collected at proposed field-screening location 16 because it was located under the road and would disrupt traffic and operations at the adjacent firing site.

Two locations (39-604436 and FS 501) were added northeast of the soil dump between the dump and the drainage to ensure the sampling grid extended to the edge of the soil dump area. The visible boundary of SWMU 39-010 was surveyed using a differential global-positioning system, and data were postprocessed to achieve submeter accuracy. The boundary of the soil dump and final sampling locations are shown on maps associated with site descriptions in section 5.

2.10.9 SWMU 39-008

Samples were not collected at two sampling locations high on the vertical wall of an amphitheater cliff because of safety concerns.

A sample was collected at location 39-604718 6.5 ft southeast of the location proposed in the investigation work plan because the location specified in the work plan is under a boulder. The final sampling location is shown on maps associated with site descriptions in section 5.

2.10.10 SWMU 39-007(a)

Locations 39-604857 and 39-604858 were beneath the concrete pad east of the building. Location 39-604857 was moved 3 ft northeast, and location 39-604858 was moved 0.5 ft south to accommodate collection without removal of the concrete. The final sampling locations are shown on maps associated with site descriptions in section 5.

2.10.11 SWMU 39-004(d)

Samples collected at SWMU 39-004(d) for analysis of dioxins/furans were not submitted for analysis. The radiological activity of these samples exceeded the criteria for acceptance by the off-site laboratory conducting dioxins/furans analysis.

2.10.12 Extended Drainages

Location 259 was under the parking lot asphalt outside the entry gate to TA-39. Parking lot construction obscured the drainage location and made collecting samples at the correct elevation impracticable.

Samples in the drainage were collected as close as possible to the locations shown in investigation work plan figures. The actual sampling locations varied somewhat from those locations. However, the work plan figures served as a guide. The final sampling locations are shown on Plates 4, 5, and 6.

2.10.13 SWMU 39-005

Two locations, 39-604838 and 39-604839, were moved as a result of their proximity to the awning of the building; because of the height of the auger, samples could not be collected. Location 39-604838 was moved 7 ft northwest. Refusal was encountered because of welded tuff, and the bottom two depths were not sampled. Location 39-604839 was moved 27.5 ft west to the opposite side of SWMU 39-005 and was still within the footprint of the seepage pit. The final sampling locations are shown on maps associated with site descriptions in section 5.

3.0 FIELD-INVESTIGATION RESULTS

This section summarizes the methods, procedures, and results of field-investigation activities, including excavation, geodetic surveying, and borehole abandonment activities conducted at the North Ancho Canyon Aggregate Area from February to June 2009. Characterization and delineation for nature and extent of contamination were conducted for SWMUs 39-002(a), 39-005, and 39-007(a) and AOCs 39-002(b), 39-002(c), 39-002(f), and 39-007(d). Limited sampling was conducted for SWMUs 39-004(c), 39-004(d), and 39-008 in accordance with the approved investigation work plan for North Ancho Canyon Aggregate Area (LANL 2007, 101894; NMED 2007, 098948). These three SWMUs continue to be impacted by current site operations; therefore, additional sampling may be necessary in the future after site activities cease. Characterization, cleanup, and confirmatory sampling were conducted for SWMUs 39-001(a), 39-001(b), and 39-006(a) inactive septic tank, inactive chemical seepage pit, inactive sand filter, and inactive vitrified-clay pipe (VCP) drainline. The sampling methods and procedures are discussed in Appendix C. Field-screening and laboratory analytical results for identification of COPCs are discussed in section 5.0.

3.1 Surface Conditions

TA-39 is located the southeastern portion of the Laboratory and is bordered to the south by Bandelier National Monument (Plate 1). TA-39 covers about 3.8 mi^2 and ranges in elevation from 6300 to 6960 ft amsl. A number of canyons, including Water, Ancho, and Indio Canyons, dissect the area. All TA-39 facilities are located in the north fork of Ancho Canyon. Topographically, the area consists of the alluvial floodplain and hill slopes of North Ancho Creek, an ephemeral stream. The elevations of the SWMUs and AOCs within the North Ancho Canyon Aggregate Area range from about 6400 ft amsl in the bottom of the canyons to about 6700 ft amsl on the mesa tops. Plate 1 shows the local topography of the North Ancho Canyon Aggregate Area.

Surface conditions of the SWMUs/AOCs within the North Ancho Canyon Aggregate Area vary but are generally vegetated with pine trees, forbs, and grasses, with the exception of six sites: SWMU 39-002(a) Area 3, AOC 39-002(b), AOC 39-002(c), AOC 39-002(f), SWMU 39-007(a), and AOC 39-007(d) are former storage areas located partially or fully under concrete, asphalt pavement, or building structures.

Surface soil in the North Ancho Canyon Aggregate Area includes soils associated with mesa tops, canyon walls, and canyon bottoms. Eroded sediment is moved by stream flow, then deposited along the stream banks during flooding events. SWMUs 39-001(a) and 39-001(b) are in areas of sediment deposition. The canyon walls next to the firing sites are steep and degrading with little or no soil

accumulation, or less steep with undeveloped soil deposits intermixed with large blocks of Bandelier Tuff sloughed from the canyon walls. The canyon bottom soil is poorly developed and is typical of the deep, well-drained Totavi series having a gravelly loamy-sand or sandy-loam texture. North Ancho Canyon and its tributaries contain alluvium of various thicknesses.

3.2 Excavation Investigations

The following sections discuss excavations conducted at three SWMUs located within the North Ancho Canyon Aggregate Area. The investigation methods are discussed in Appendix C. Unless otherwise noted, the samples were collected from each excavation pit in accordance with the approved investigation work plan for North Ancho Canyon Aggregate Area (LANL 2007, 101894; NMED 2007, 098948). Deviations from the investigation work plan are described in section 2.10.

Excavation Permit No. 08X-1223 was obtained for the North Ancho Canyon Aggregate Area. Utilities were located in accordance with this permit before any fieldwork or excavation activities began.

The boundaries for SWMUs 39-001(a), 39-001(b), and 39-006(a) delineated in the approved North Ancho Canyon Aggregate Area investigation work plan (LANL 2007, 101894; NMED 2007, 098948) were surveyed and marked in the field with pin flags to guide excavation at each site. The extent of the waste and inactive structures was determined during excavation by visual observation of previously excavated waste material, structures, or matrix.

3.2.1 SWMU 39-001(a)

3.2.1.1 Site Description

Anecdotal evidence from long-time site workers before the 1997 Resource Conservation and Recovery Act facility investigation (RFI) was conducted suggested that SWMU 39-001(a) consisted of two 80- × 20- × 10-ft-deep rectangular trenches (LANL 1997, 055633, p. 5-1; LANL 2007, 101894, p. 21). Based on the results of a 1993 geophysical survey, the 1997 RFI concluded this disposal area actually consists of a single, amorphous unit (LANL 1997, 055633, p. 5-2). Excavation activities associated with the 2009 field investigation confirmed a solitary, irregularly shaped disposal trench coincident with the anomalies identified by the 1997 RFI geophysical survey.

Utility potholing and a series of test pits excavated during the 1997 RFI, in combination with exploratory trenching, constrained the boundaries of the disposal trench. Potholing was conducted east of Ancho Road to locate the existing water line immediately west of the excavation boundary. Potholes were dug to an approximate depth of 4 ft, and waste was not encountered. At the southern terminus of the excavation, visible waste did not continue past the water line. Waste was not encountered in the1997 RFI test pit 39-01390, and the RFI confirmed the southern boundary of the disposal trench (LANL 1997, 055633, p. 5-2). The eastern boundary of the excavation was confirmed via exploratory trenching and 1997 RFI test pits 39-01388 and 39-01389, which also did not uncover evidence of waste (LANL 1997, 055633, p. 5-2).

Several exploratory trenches were dug near the asphalt pad to confirm the conclusion of the 1997 RFI that a second disposal trench was not present in the area. Waste was not encountered in exploratory trenches near the asphalt pad, and as with test pits 39-01388 and 39-01389, the RFI verified a second trench did not exist.

At its maximum dimensions, the excavation measured 238 × 66 × 11 ft deep, with an average depth of 5.3 ft. The azimuth of the long axis of the excavation was 163 degrees from grid north. The final total

bank volume for the excavation, without swell and inclusive of overburden and waste material, was 2200 yd^3 (Green 2009, 106947). The excavation boundary reflects the extent of solid waste and debris formerly in situ at SWMU 39-001(a). Figure 3.2-1 shows final excavation boundary, the 1997 RFI geophysical survey boundary, and the locations of exploratory trenches and 1997 RFI test pits. Figure 3.2-2 is a three-dimensional rendering of the excavation after it was completed.

3.2.1.2 Results of Exploratory Trenching

Four exploratory trenches were dug at SWMU 39-001(a) at the asphalt pad within or near the eastern trench as shown in Figure 2.3-2 of the approved investigation work plan (LANL 2007, 101894, p. 112; NMED 2007, 098948). As discussed in section 3.2.1.1, trench boundaries shown in the investigation work plan figures are derived from anecdotal information from long-time site workers (LANL 2007, 101894, p. 21; LANL 1997, 055633, p. 5-1). One exploratory trench trended east-west and propagated from visible waste in the main excavation towards the center of the asphalt pad. Two exploratory trenches within the eastern trench boundary were roughly north-south trending: one trench was excavated at the northern extent of the asphalt pad and the other at the southern extent. These trenches propagated from several feet outside of the pad boundary towards the center of the pad. Another exploratory trench was excavated diagonally across the northwestern corner of the asphalt pad. No evidence of waste was found in any of the trenches at the asphalt pad. Three additional exploratory trenches were dug. One trench, trending west to east, was excavated approximately 60 ft north of the asphalt pad; no evidence of waste was found. Two trenches were excavated north and northeast of the western trench, as shown in Figure 2.3-2 of the approved investigation work plan (LANL 2007, 101894, p.112). Waste was found during the excavation of both of these trenches. The locations of the exploratory trenches are shown in Figure 3.2-1. Figure 3.2-2 is a three-dimensional rendering of the excavated area.

3.2.1.3 Type of Materials Excavated

Overburden topsoil excavated from SWMU 39-001(a) varied in thickness from approximately 1 to 3 ft. The interface between waste and topsoil was visually apparent, and all overburden was piled and sampled separately from waste. Some of SWMU 39-001(a) was covered with asphalt, which was removed and segregated.

Waste material excavated from within SWMU 39-001(a) was composed of an extensive variety of constituents. Based on visual observations, it consisted of approximately 60% soil and 40% debris by volume. The soil element of the media was a sandy loam. Most of the debris volume included metal, cabling, and wire. Comingled with these materials was a lesser volume of glass, wood, plastics, Styrofoam, and concrete.

Two capacitors were unearthed from SWMU 39-001(a). One capacitor had a hole and was leaking oil. The other was structurally sound. Both capacitors were placed on plastic sheeting next to the area within the excavation where they were located. Oil from both capacitors was sampled, confirming the presence of PCBs. After the capacitors and plastic were placed into a drum, visual inspection of the area revealed staining beneath the plastic. The areas were cleaned by hand excavating the immediate spill and surrounding soil to an average depth of 0.5 ft, until no visual evidence of oil was found. An addendum to the field implementation plan was prepared describing additional confirmatory samples resulting from the discovery and spill of PCBs. The confirmation sampling approach was based on multi-increment sampling. Seventeen decision units were established over the spill areas; within each decision unit 50 increments were collected and composited as a single sample. Samples were collected in accordance with standard operating procedure (SOP) EP-ERSS-SOP-0609, “Spade and Scoop Method for Collection of Soil Samples.”

Preliminary data from the confirmation samples determined the continued presence of PCBs greater than 1 ppm in 8 of the 17 decision units. An additional 2 ft of material was excavated beneath the impacted decision units, and further confirmation sampling was conducted. Analytical results for these samples have not yet been received.

3.2.2 SWMU 39-001(b)

3.2.2.1 Site Description

SWMU 39-001(b) consists of three disposal trenches also known as Material Disposal Area Y. The final excavation of SWMU 39-001(b) at its maximum dimensions measured 349 × 98 × 16 ft deep, with an average depth of 8.1 ft. The azimuth of the long axis of the excavation was 174 degrees from grid north. The final total bank volume for the excavation, without swell and inclusive of overburden and waste material, was 7200 yd^3 (Green 2009,106947). Figure 3.2-3 shows the SWMU 39-001(b) disposal trenches with an overlay of the final excavation boundary. Figure 3.2-4 is a three-dimensional rendering of the excavated area.

3.2.2.2 Type of Materials Excavated

The depth of the overburden covering the trench was primarily uniform at 3 ft, with small pockets of more shallow covering. The overburden was composed of a sandy loam. The interface between waste and topsoil was apparent, and all overburden was piled and sampled separately from the waste.

Waste material excavated from within SWMU 39-001(b) consisted of a variety of constituents. Based on visual observation, the waste material consisted of approximately 60% soil and 40% debris by volume. The soil element of the media was a sandy loam. The majority of the debris consisted of metal, cabling, and wire. Comingled with the debris were lesser volumes of glass, wood, plastics, Styrofoam, and concrete. Five pieces of metal of varying sizes with elevated radiological screening results 10–100 times greater than background (approximately 4000 counts per minute) for beta and gamma radiation were also excavated.

A cache of brown glass bottles containing unknown chemicals was discovered during the excavation. After these bottles were sampled by Emergency Management and Response personnel, they were removed from the excavation site for further characterization. Sampling by Emergency Management and Response personnel indicated the presence of sulfuric acid and photographic chemicals. The entire volume of the bottles was analyzed and disposed of as spent sampling media.

3.2.3 SWMU 39-006(a)

3.2.3.1 Site Description

Sand Filter

At its maximum dimensions, the excavation at the SWMU 39-006(a) sand filter measured 83 × 44 × 11.3 ft deep, with an average depth of 5.2 ft. The azimuth of the long axis of the excavation was 26.8 degrees from grid north. The final total bank volume for the excavation, without swell and inclusive of overburden and waste material, was 800 yd^3 (Green 2009,106947). Figure 3.2-5 shows the final excavation boundary of the sand filter.

The thickness of the overburden covering the sand filter primarily increased from 3 ft on the east to 4 ft on the west as a result of the natural grade. All the material excavated was composed of a homogeneous

sandy loam with no debris, aside from intact VCP. The interface between waste and topsoil was apparent because the VCP lay on top of the filter material. The VCP was excavated, size-reduced, and placed in a rolloff bin. All overburden was piled and sampled separately from the waste.

Septic Tank

SWMU 39-006(a) consisted of an 1800-gal. septic tank constructed of reinforced concrete. The tank was located immediately adjacent to and south of the seepage pit and measured approximately 5 ft wide × 12 ft long × 8 ft deep. The septic tank was located 18 ft northeast of the location specified in the approved investigation work plan (LANL 2007, 101894; NMED 2007, 098948).

The overburden covering the septic tank was a sandy loam, and the thickness was uniform at 2 ft. The overburden was removed, piled, and sampled separately from the waste. The tank's contents included the same sandy loam as the overburden, with a small amount of debris assumed to be part of the tank itself. After the inside of the tank was excavated, the tracked excavator and a backhoe-mounted hydraulic hammer were used to break up the concrete and rebar. This debris was excavated and placed in rolloff bins. Figure 3.2-6 shows the final excavation boundaries and sampling locations. Because the septic tank and seepage pit border each other, the excavation for both features is shown as one contiguous pit.

Seepage Pit

The chemical seepage pit measured approximately 11 ft × 14 ft × 8 ft and was located immediately adjacent and north of the septic tank. The overburden covering the seepage pit consisted of a sandy loam, and the thickness was uniform at 2 ft thick. The overburden was removed, piled, and sampled separately from the waste.

The pit consisted of large cobblestones mixed with sandy loam. It was excavated using the tracked excavator, and the contents were piled and sampled separately from any other waste. Figure 3.2-6 shows the final excavation boundaries and sampling locations. Because the septic tank and seepage pit border each other, the excavation for both features is shown as one contiguous pit.

3.3 Geophysical Logging

Samples at the 18 sites investigated during the fieldwork for this investigation report were collected at shallow depths too shallow and did not require drilling and borehole logging. All samples were collected from less than 10 ft bgs, except at the excavations. At the excavations, the total depths below the ground surface were greater, but the samples were collected postexcavation at 1–2 ft below the excavation bottom.

3.4 Subsurface Conditions

Historical subsurface data of the canyon bottom sediment were from cores obtained from SWMUs 39-001(a) and 39-001(b) during the 1997 RFI (LANL 1997, 055633, pp. 5-1 to 5-86). Historical data indicated the presence of very old sediment buried beneath part of the canyon bottom and relatively long-term stability of much of the canyon bottom. Geological units encountered in regional well R-31 included, in descending order, alluvium; the Otowi Member of the Bandelier Tuff, including the basal Guaje Pumice Bed; sediment beneath the Bandelier Tuff; lavas, interflow units, and subflow deposits of the Cerros del Rio volcanic field; and deposits of the Puye Formation, including both fanglomerates and river gravels (LANL 2007, 101894). The location of well R-31 is discussed in section 3.8 and shown on Plate 1.

3.5 Borehole Abandonment

Borehole abandonment occurred only at SWMU 39-005. Seven boreholes were drilled to a depth of 10 ft bgs, and one borehole was drilled to a depth of 6 ft bgs because of refusal. Total volumes for the boreholes were determined to be 1.3^3 ft for the 10-ft holes and 0.75^3 ft for the 6-ft hole. During abandonment, bentonite and water were simultaneously placed into each borehole, and the borehole was visually inspected to ensure proper settling of the bentonite. Once the bentonite-water mixture reached a height of 2 ft bgs, the surrounding soil was used to fill the remaining space. The boreholes were periodically inspected after abandonment to ensure no settling had occurred.

3.6 Excavation Backfilling

After excavation and confirmatory sampling were completed, the trenches were backfilled and the sites were restored. The data collected by sampling the waste stockpiles during excavation were screened by ENV-RCRA using Automated Waste Determination software for values exceeding the land-application criteria. Material below NMED residential SSLs was used as backfill. Wherever practicable, the material was returned to the excavation area where it originated. Backfill operations were documented in the appropriate field logbook. Analytical results from the clean fill were determined to be below Laboratory BVs, and analytical results from samples of the stockpiles were determined to be below residential screening levels before backfilling was completed. Figure 3.6-1 shows the locations of the stockpiles at the three sites excavated.

Stockpile 1, composed of excavation overburden from SWMU 39-001(b), was placed back into the excavation at floor level at the extreme south end of the excavation. Stockpile 3, composed of sand filter material from SWMU 39-006(a), was placed into the sand filter excavation. It was spread and compacted along the entire floor to a height of approximately 3 ft. Stockpile 5, composed of seepage pit and septic tank excavation overburden, was placed into the seepage pit/septic tank excavation, spread, and compacted along the entire floor to a height of approximately 3 ft. Stockpile 7, composed of sand filter overburden, was placed into the remaining excavation and also compacted.

The remaining material needed to finish backfilling the excavated areas was taken from material excavated by from the Entrada Business Park construction project. During construction, large quantities of loam and tuff had been excavated and piled in Pueblo Canyon. During the excavation at TA-39, this material was sampled and periodically inspected visually to confirm its composition. A sample of the material was submitted for off-site analysis, and the results confirmed no contamination was present and the material did not contain any analytes exceeding BVs. Table 3.6-1 lists the results of screening for the material from the Entrada Business Park.

The excavation pit of SWMU 39-001(a) has yet to be backfilled because analytical results have not yet been received for the confirmation samples collected from areas where additional excavation was needed because PCB concentrations exceeded cleanup levels.

3.7 Groundwater Conditions

The vadose zone of the Pajarito Plateau is very thick and consists primarily of Bandelier Tuff. The vadose zone of most interest is the unsaturated alluvium of the canyon bottom because all of the North Ancho Canyon SWMUs and AOCs potentially affect this zone. Three exploratory boreholes (locations 39-1120, 39-1134, and 39-1135), ranging in depth from 25 to 126 ft bgs, were drilled in the vicinity SWMUs 39-001(a) and 39-001(b) during the 1997 RFI (LANL 1997, 055633, pp. 5-1 to 5-7) and completed as monitoring wells. Saturated conditions were observed in three angled boreholes (ASC-15,

ASC-16, and ASC-18) drilled beneath SWMU 39-001(b) (LANL 1997, 055633, p. 2-3). None of the other boreholes drilled to similar depths during the 1997 RFI showed indications of saturated conditions; therefore, any perched-intermediate groundwater is probably not extensive. The conditions necessary to support perched groundwater are not present at these sites (Collins et al. 2005, 092028, pp. 2-97 to 2-100).

During installation of well R-31 in North Ancho Canyon, groundwater was encountered between 521 and 537 ft bgs (Vaniman et al. 2002, 072615). The location of well R-31 within North Ancho Canyon is depicted on Plate 1.

A sampling event was conducted by the Laboratory in the Ancho Watershed from May 8 to May 28, 2007. During the sampling, groundwater samples were collected from well R-31, a regional groundwater monitoring well located within the North Ancho Aggregate Area. The upper screen (454 ft bgs) of R-31 was set in an intermediated-perched groundwater zone that has produced no water. Iron and manganese concentrations exceeded the New Mexico Water Quality Control Commission groundwater standards in regional well R-31 at both screens located 532 and 670 ft bgs (LANL 2007, 101357).

3.8 Surface-Water Conditions

Surface water in the North Ancho Canyon Aggregate Area consists of stormwater, snowmelt runoff, and spring flow in small drainages.

Site-specific stormwater-runoff monitoring was conducted Under the Federal Facilities Compliance Agreement, now superseded as the NPDES Individual Permit, April 1, 2009. Specific sites monitored in the North Ancho Aggregate Area include the firing sites SWMUs 39-004(a), 39-004(b), 39-004(d), and 39-004(e) in Subaggregate 1 and SWMU 39-004(c) in Subaggregate 2. The surface-water monitoring locations are also shown on Plate 1.

4.0 REGULATORY CRITERIA

This section describes the criteria used to screen 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 sites.

4.1 Current and Future Land Uses

The current or reasonably foreseeable future use for this aggregate area is industrial. The aggregate area includes four active sites [SWMUs 39-004(c), 39-004(d), 39-008, and 39-006(a) the active components] at which ongoing operations result in discharges to the environment. No risk-screening assessments for human health or ecological risk were conducted for these sites. The remaining SWMUs and AOCs were evaluated for risk and dose under the industrial and residential scenarios. The extended drainages lie within the ephemeral stream channel in the bottom of North Ancho Canyon; this area was evaluated under the recreational and residential scenarios.

4.2 Human Health Screening Levels

Human health risk-screening assessments for chemical COPCs were conducted using SSLs for the industrial and residential scenarios from NMED guidance (NMED 2006, 092513). NMED SSLs are based on a hazard quotient (HQ) of 1.0 and a cancer risk of 1×10^{-5} (NMED 2006, 092513). If SSLs were not available from NMED guidance, EPA regional screening levels

(http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm) were used. The EPA SSLs for carcinogens were multiplied by 10 to adjust from a 10^{-6} cancer risk level to the NMED target cancer risk level of 10^{-5}. Recreational SSLs for the extended drainages were obtained from Laboratory guidance (LANL 2007, 094496) and have the same risk bases as the NMED and EPA values. Radionuclide SALs were obtained from Laboratory guidance (LANL 2005, 088493) for each scenario and are based on a 15 mrem/yr dose (DOE 2000, 067489). The SSLs and SALs are presented in Table 4.2-1.

4.3 Ecological Screening Levels

All of the sites, except for the active firing sites [SWMUs 39-004(c), 39-004(d), and 39-008] and SWMUs 39-001(a), 39-001(b), and 39-002(b) were evaluated for potential ecological risk. 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, 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).

4.4 Cleanup Goals

As specified in Section VIII.B.1 of the Consent Order, screening levels are 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 and SALs depending on the current and foreseeable future land use at each site.

The sites undergoing remediation were excavated until confirmatory samples were below the industrial SSLs. The industrial SSLs from version 4.0 of the NMED guidance (NMED 2006, 092513) were in effect at the time of the excavations and were used to screen the confirmatory samples. The maximum detected concentration of each COPC in the confirmatory samples was compared with the industrial SSL or SAL to determine if further excavation was needed. However, as stated above, the risk-screening assessments presented in this report were conducted using SSLs from version 5.0 of the NMED guidance (NMED 2009, 106420).

The cleanup goals specified in Section VIII of the Consent Order are a target cancer risk of 1×10^{-5} and a 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 Table 4.2-1 and Appendix H are based on these cleanup goals.

5.0 SITE BACKGROUND AND CONTAMINATION

5.1 Soil, Tuff, and Sediment Sampling Summary

The subsections for each site provide the number of samples collected from soil, sediment, and tuff at each investigation site. For most sites, the results include only data collected during the 2009 investigation. Decision-level historical data are included only for SWMUs 39-001(a), 39-002(a) Area 1, 39-004(c), 39-004(d), 39-006(a) inactive components, 39-007(a), and 39-008. The historical data were collected in 1995, 1996, and 2001. Sampling at most sites included depths ranging from only 0–2 or 0–3 ft bgs. Only the excavated sites and SWMU 39-005 were sampled at greater depths.

5.2 Results of Field Screening of Samples for All Sites

This section describes the field screening for radioactivity and organic vapors conducted as part of the sampling at each of the sites investigated. The field screening for PCBs, explosives, and metals was conducted at only some of the sites per the approved investigation work plan (LANL 2007, 101894; NMED 2007, 098948). The results of those field-screening tests are presented under the individual sites.

5.2.1 Field Screening for Radioactivity

Field screening for radioactivity of surface and subsurface materials was performed continuously during the investigation, as described in Appendix C. Radiation and chemical field-screening results were recorded in the SCLs included in Appendix D. No samples were collected at any of the North Ancho Canyon Aggregate Area sites based on field screening for radioactivity. The field-screening results were compared with local background levels calculated as necessary in ambient air. Environmental factors, such as temperature, wind speed, and humidity, affected background readings. Local background levels across the site provided a baseline for naturally occurring radioactivity and were also used throughout drilling as the target for sampling based on elevated radiation levels.

5.2.2 Field Screening for Organic Vapors

Field screening for organic vapors was conducted throughout the investigation sampling as described in Appendix C. Field-screening results were recorded in the SCLs presented in Appendix F. Local background levels were measured from ambient air and recorded in units of ppm. All organic vapor field-screening levels were within 1 order of magnitude of the local background levels. No samples were collected at any of the North Canyon Aggregate Area sites based on field screening for organic vapors.

5.3 SWMU 39-002(a) Area 1

5.3.1 Site Description and Operational History

SWMU 39-002(a), shown on Plate 1, consists of three storage areas. Each area is discussed in a separate subsection. Storage Area 1 is a former outdoor storage area and SAA located next to the northwest corner of building 39-02. The site measured approximately 25 × 30 ft and was unpaved and unprotected by any type of roof or walls. The storage area was bounded by various structures on the north, south, and east, and an asphalt ramp was located in the east-central portion of the storage area (LANL 2007, 098281). This site was used for approximately 10 yr before its installation as an SAA. At one time, this site contained a 30-gal. drum that held small quantities of solvents (acetone and ethanol) and adhesives, along with rags and paper wipes contaminated with solvents or adhesives. The area was also used to store lead-containing materials and damaged capacitors and transformers that may have contained PCBs. The area has not been used since 1993 (LANL 2007, 098281).

5.3.2 Historical Investigations

During the 1993 Phase I RFI, five samples were collected from two locations in Storage Area 1 (LANL 1995, 046190, p. 4-2). The results from these samples showed detections of inorganic chemicals, SVOCs, HE, and radionuclides. This site was recommended for corrective action in the 1995 RFI report (LANL 1995, 046190, p. 4-10).

As part of preliminary fieldwork for the voluntary corrective action (VCA) implemented at Area 1, the site was resampled in 1995 for inorganic chemicals and total uranium (LANL 1997, 056758, p. 3). Twenty-five

locations were sampled at multiple depths and field screened using an XRF. Two additional surface soil samples were also submitted for laboratory analyses. The results from these samples did not replicate the inorganic chemical and total uranium results from the 1993 Phase I RFI (LANL 1997, 056758, p. 3). Therefore, the proposed VCA activities included further site characterization to define the nature and extent of potential contamination at the site (LANL 1997, 056758, p. 4).

In 1997, as part of the VCA activities, a sampling grid was established over the site. Soil samples were collected from the center of each grid at a depth of 0–0.5 ft bgs for a total of nine samples from nine locations. Three additional locations were sampled at a depth of 1–1.5 ft bgs (LANL 1997, 056758, p. 17).

Inorganic and organic chemicals were detected above BVs in at least one sample, and 19 polycyclic aromatic hydrocarbons (PAHs) were detected in the majority of the surface samples. Uranium-238 was also detected above fallout value (FV) at two locations (LANL 1995, 046190, p. 4-1 to 4-10; LANL 1997, 056758).

5.3.3 Field Screening for TNT, RDX, and Metals

No detections of TNT were found in the samples field screened for this site. RDX was detected in samples from locations 39-604806, 39-604812, and 39-604813 at concentrations ranging from 0.7 to 14 ppm. All samples with detected concentrations of RDX were submitted for off-site analysis. The XRF results for metals were reviewed, and samples for off-site analysis were collected at the locations with high detections of copper, lead, and uranium. The field-screening results for all samples are presented in Appendix D.

5.3.4 Sampling Analytical Results and COPC Identification

The locations sampled for SWMU 39-002(a) Area 1 are shown in Figure 5.3-1. Table 5.3-1 summarizes samples collected and analytical requests for each sample.

Inorganic Chemicals

Table 5.3-2 lists the inorganic chemicals detected above BV or having detection limits above BV. Detected concentrations of inorganic chemicals above BVs are shown in Figure 5.3-2.

The identification of inorganic COPCs is presented in Appendix B, section B-2.1.1. The inorganic chemicals identified as COPCs at SWMU 39-002(a) Area 1 are antimony, cadmium, copper, cyanide, lead, mercury, perchlorate, silver, thallium, and zinc.

Organic Chemicals

Table 5.3-3 lists the organic chemicals detected at SWMU 39-002(a) Area 1. Detected concentrations of organic chemicals are shown on Plate 2.

The identification of organic COPCs is presented in Appendix B, section B-2.1.2. The organic chemicals identified as COPCs at SWMU 39-002(a) Area 1 are acenaphthene; acenaphthylene; 4-amino-2,6-dinitrotoluene; 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; dibenzofuran; 1,2-dichlorobenzene; ethylbenzene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; indeno(1,2,3-cd)pyrene; iodomethane; methylene chloride;

2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; phenanthrene; pyrene; tetryl; toluene; TPH-DRO; trichloroethene; 1,2,4-trimethylbenzene; 2,4,6-trinitrotoluene; 1,2-xylene; and 1,3-xylene+1,4-xylene.

Radionuclides

Table 5.3-4 lists the radionuclides detected or detected above BV/FV. Radionuclides detected or detected above BVs/FVs are shown in Figure 5.3-3.

The identification of radionuclide COPCs is presented in Appendix B, section B-2.1.3. The radionuclides identified as COPCs at SWMU 39-002(a) Area 1 are plutonium-239/240, tritium, and uranium-238.

5.3.5 Spatial Distribution of COPCs at SWMU 39-002(a) Area 1

The COPCs at SWMU 39-002(a) Area 1 are summarized in Table 5.3-5. The lateral and vertical extent of COPCs at SWMU 39-002(a) Area 1 are evaluated in Appendix B, section B-2.1.5. The following sections summarize the results of that evaluation.

5.3.5.1 Inorganic Chemicals

The distribution of inorganic COPCs at SWMU 39-002(a) Area 1 is shown in Figure 5.3-2; the analytical results are presented in Table 5.3-2. The lateral and vertical extent of contamination are defined for antimony, cadmium, cyanide, perchlorate, silver, and thallium.

The lateral extent of copper, lead, mercury, and zinc is defined, but vertical extent is not defined at one or two locations.

5.3.5.2 Organic Chemicals

The distribution of organic COPCs at SWMU 39-002(a) Area 1 is shown on Plate 2; the analytical results are presented in Table 5.3-3. The lateral and vertical extent of contamination are defined for all organic COPCs except Aroclor-1254. The lateral extent of Aroclor-1254 is defined, but vertical extent is not defined at one location.

5.3.5.3 Radionuclides

The distribution of radionuclide COPCs at SWMU 39-002(a) Area 1 is shown in Figure 5.3-3; the analytical results are presented in Table 5.3-4. Lateral and vertical extent are defined for all four radionuclide COPCs.

5.3.6 Summary of Human Health and Ecological Risk Assessment Results

The COPCs for SWMU 39-002(a) Area 1 were evaluated using both industrial and residential SSLs and SALs. The total excess cancer risk of 2×10^{-5} for the industrial scenario is slightly above the NMED target level of 1×10^{-5} (NMED 2009, 106420). The industrial HI of 0.1 is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose for the industrial scenario of 0.1 mrem/yr is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total excess cancer risk of 6×10^{-5} for the residential scenario is above the NMED target level of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.8 is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose for the residential scenario of 0.6 mrem/yr is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The potential

unacceptable risks for both scenarios are primarily from benzo(a)pyrene [and dibenz(a,h)anthracene for residential]. The ecological risk-screening assessment determined there are no ecological risks to receptors.

5.4 SWMU 39-002(a) Area 2

5.4.1 Site Description and Operational History

Area 2 of SWMU 39-002(a) (Plate 1) is a former indoor SAA (inside room 18-A of building 39-02) that has been removed. It was used for approximately 10 yr for storing waste chemicals from photographic processing. No known or documented releases are associated with this SAA. Because the site was located inside a building, there was no potential for environmental releases (LANL 2007, 098281).

5.4.2 Historical Investigations

SWMU 39-002(a) Area 2 was not sampled during the 1993 Phase I RFI because it was located inside an office/laboratory building (39-02).

5.5 SWMU 39-002(a) Area 3

5.5.1 Site Description and Operational History

Area 3 of SWMU 39-002(a) is a former outdoor SAA and holding/receiving area located on the asphalt driveway at the north end of the loading dock on the southeast side of building 39-02 (Plate 1). This area is no longer used for storage (LANL 2007, 098281).

5.5.2 Historical Investigations

Area 3, located on asphalt pavement, was not sampled during the 1993 Phase I RFI because it was being used for storage.

5.5.3 Sampling Analytical Results and COPC Identification

The locations sampled for SWMU 39-002(a) Area 3 are shown in Figure 5.5-1. Table 5.5-1 summarizes samples collected and analytical requests for each sample.

Inorganic Chemicals

Table 5.5-2 lists the inorganic chemicals detected above BV or having detection limits above BV. Detected concentrations of inorganic chemicals above BVs are shown in Figure 5.5-2.

The identification of inorganic COPCs is presented in Appendix B, section B-2.3.1. The inorganic chemicals identified as COPCs at SWMU 39-002(a) Area 3 are antimony, copper, and cyanide.

Organic Chemicals

Table 5.5-3 lists the organic chemicals detected at SWMU 39-002(a) Area 3. Detected concentrations of organic chemicals are shown in Figure 5.5-3.

The identification of organic COPCs is presented in Appendix B, section B-2.3.2. The organic chemicals identified as COPCs at SWMU 39-002(a) Area 3 are 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; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; 2,3,4,6,7,8-hexachlorodibenzofuran; indeno(1,2,3-cd)pyrene; iodomethane; methylene chloride; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; PETN (pentaerythritol tetranitrate); phenanthrene; pyrene; and trichlorofluoromethane.

Radionuclides

No radionuclides were detected or detected above the BVs/FVs at SWMU 39-0002(c) Area 3.

5.5.4 Spatial Distribution of COPCs at SWMU 39-002(a) Area 3

The COPCs at SWMU 39-002(a) Area 3 are summarized in Table 5.5-4. The lateral and vertical extent of COPCs at SWMU 39-002(a) Area 3 are evaluated in Appendix B, section B-2.3.5. The following sections summarize the results of that evaluation.

5.5.4.1 Inorganic Chemicals

The distribution of inorganic COPCs at SWMU 39-002(a) Area 3 is shown in Figure 5.5-2; the analytical results are presented in Table 5.5-2. Lateral and vertical extent are defined for of all inorganic COPCs.

5.5.4.2 Organic Chemicals

The distribution of organic COPCs at SWMU 39-002(a) Area 3 is shown in Figure 5.5-3; the analytical results are presented in Table 5.5-3. The lateral and vertical extent of all organic COPCs are defined.

5.5.4.3 Radionuclides

There were no radionuclide COPCs at SWMU 39-002(a) Area 3.

5.5.5 Summary of Human Health and Ecological Risk Assessment Results

The COPCs for SWMU 39-002(a) Area 3 were evaluated using both industrial and residential SSLs. No radionuclide COPCs were identified at this site. The total excess cancer risk of 8×10^{-7} for the industrial scenario is below the NMED target level (NMED 2009, 106420). The industrial HI of 0.0009 is below the NMED target HI of 1.0 (NMED 2009, 106420). The total excess cancer risk of 4×10^{-6} for the residential scenario is below NMED target for risk of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.05 is below the NMED target HI of 1.0 (NMED 2009, 106420). The ecological risk-screening assessment determined there are no ecological risks to receptors.

5.6 AOC 39-002(b) Storage Area

5.6.1 Site Description and Operational History

AOC 39-002(b), shown on Plate 1, is an active SAA located on a 5- × 5-ft concrete pad next to a firing site support building (structure 39-06) and an active firing site [SWMU 39-004(c)]. SWMU 39-004(c) was also

used for storage before it became an SAA. Nothing is currently stored in the area (LANL 1993, 015316, p. 5-16).

5.6.2 Historical Investigations

During the 1993 RFI, two surface samples were collected from two locations at AOC 39-002(b): one from the closest point to the storage area, next to the concrete pad and the Other from a localized drainage 10 ft northeast of the concrete pad. PCBs and inorganic chemicals were detected in both samples (LANL 1995, 046190, p. 4-10). However, these results are screening-level data (LANL 2007, 098281).

5.6.3 Analytical Results and COPC Identification

This site was not sampled (see section 2.10 for deviations from the investigation work plan).

5.6.4 Summary of Human Health and Ecological Risk Assessment Results

This site was not sampled (see section 2.10 for deviations from the investigation work plan).

5.7 AOC 39-002(c) Storage Area

5.7.1 Site Description and Operational History

AOC 39-002(c), shown on Plate 1, is a former outdoor SAA that was located on an asphalt-paved area next to the southwest corner of the gas-gun support structure (39-56). This SAA stored waste paper, solvent-contaminated rags (ethanol, acetone, and trichloroethane), and vacuum grease. It is not known if this area was used for storage before its installation as an SAA.

5.7.2 Historical Investigations

During the 1993 Phase I RFI, two surface soil samples were collected from two locations at AOC 39-002(c) (LANL 1995, 046190, p. 4-15). One sample was collected near the southeastern corner of structure 39-56 immediately adjacent to the storage area, and the other sample was collected 15 ft north of the storage area from soil closest to the asphalt pad. Based on the Phase I RFI data, the site was recommended for a VCA because PCBs, lead, and uranium were detected above screening levels (LANL 1995, 046190, p. 4-20).

The VCA was conducted at this site in 1995. Before the start of the VCA, two additional areas of potential contamination associated with structure 39-56 were identified. The first was located on the southwest corner of the building and consisted of oil-stained soil beneath an air compressor. The second area was located on the west side of the building and consisted of a small area contaminated with depleted uranium. Because the areas were small and distinct, they were addressed as part of the VCA. The VCA consisted of soil removal and confirmation sampling in four localized areas—the two RFI sampling locations and the two additional areas identified during the walk-over of the site before the commencement of the remedial activities (LANL 1996, 054401, p. 1). Following soil removal, two confirmation samples were collected from each of the four excavated areas, and the excavations were backfilled with clean soil.

5.7.3 Analytical Results and COPC Identification

The locations sampled for AOC 39-002(c) are shown in Figure 5.7-1. Table 5.7-1 summarizes samples collected and analytical requests for each sample.

Inorganic Chemicals

Table 5.7-2 lists the inorganic chemicals detected above BV or having detection limits above BV. Detected concentrations of inorganic chemicals above BVs are shown in Figure 5.7-2.

The identification of inorganic COPCs is presented in Appendix B, section B-2.5.1. The inorganic chemicals identified as COPCs at AOC 39-002(c) are antimony, cadmium, copper, cyanide, mercury, and zinc.

Organic Chemicals

Table 5.7-3 lists the organic chemicals detected at AOC 39-002(c). Detected concentrations of organic chemicals are shown in Figure 5.7-3.

The identification of organic COPCs is presented in Appendix B, section B-2.5.2. The organic chemicals identified as COPCs at SWMU 39-002(c) are Aroclor-1254; benzo(a)anthracene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; toluene; and 1,3-xylene+1,4-xylene.

Radionuclides

Samples from AOC 39-002(c) were not analyzed for radionuclides.

5.7.4 Spatial Distribution of COPCs at AOC 39-002(c)

The COPCs at AOC 39-002(c) are summarized in Table 5.7-4. The lateral and vertical extent of COPCs at AOC 39-002(c) are evaluated in Appendix B, section B-2.5.4. The following sections summarize the results of that evaluation.

5.7.4.1 Inorganic Chemicals

The distribution of inorganic COPCs at AOC 39-002(c) is shown in Figure 5.7-2; the analytical results are presented in Table 5.7-2. Lateral and vertical extent are defined for all inorganic COPCs at this site.

5.7.4.2 Organic Chemicals

The distribution of organic COPCs at AOC 39-002(c) is shown in Figure 5.7-3; the analytical results are presented in Table 5.7-3. Lateral and vertical extent are defined for all organic COPCs at this site.

5.7.4.3 Radionuclides

There were no radionuclide COPCs at AOC 39-002(c).

5.7.5 Summary of Human Health and Ecological Risk Assessment Results

The COPCs for AOC 39-002(c) were evaluated using both industrial and residential SSLs. No radionuclide COPCs were identified at this site. The total excess cancer risk of 6×10^{-8} for the industrial scenario is below the NMED target level of 1×10^{-5} (NMED 2009, 106420). The industrial HI of 0.005 is below the NMED target HI of 1.0 (NMED 2009, 106420). The total excess cancer risk of 3×10^{-7} is below the NMED target level of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.07 is below the NMED target HI of 1.0 (NMED 2009, 106420). The ecological risk-screening assessment determined there are no ecological risks to receptors.

5.8 AOC 39-002(f) Storage Area

5.8.1 Site Description and Operational History

AOC 39-002(f), shown on Plate 1, is a former SAA located on the asphalt driveway outside the northeast corner of a support structure (39-88) for an active firing site [SWMU 39-004(e)]. Before this area became an SAA, it was used to store small quantities of waste solvents (ethanol, acetone, and trichloroethane); copper sulfate; transformer oil; vacuum grease; and photographic wastes (LANL 1993, 015316, p. 5-18).

5.8.2 Historical Investigations

Previous investigations at AOC 39-002(f) included two surface samples collected within the footprint of the storage area in 1993 (LANL 1995, 046190, p. 4-29). Although sampling was performed to determine possible impacts from adjacent firing sites, the results are screening-level data and are not discussed or reported (LANL 2007, 098281).

5.8.3 Sampling Analytical Results and COPC Identification

The locations sampled for AOC 39-002(f) are shown in Figure 5.8-1. Table 5.8-1 summarizes samples collected and analytical requests for each sample.

Table 5.8-2 lists the inorganic chemicals detected above BV or having detection limits above BV. Detected concentrations of inorganic chemicals above BVs are shown in Figure 5.8-2.

The identification of inorganic COPCs is presented in Appendix B, section B-2.6.1. The inorganic chemicals identified as COPCs at AOC 39-002(f) are antimony, copper, and perchlorate.

Organic Chemicals

Table 5.8-3 lists the organic chemicals detected at AOC 39-002(f). Detected concentrations of organic chemicals are shown in Figure 5.8-3.

The identification of organic COPCs is presented in Appendix B, section B-2.6.2. The organic chemicals identified as COPCs at AOC 39-002(f) are benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorobenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; phenanthrene; pyrene; and toluene.

Radionuclides

Samples from AOC 39-002(f) were not analyzed for radionuclides.

5.8.4 Spatial Distribution of COPCs at AOC 39-002(f)

The COPCs at AOC 39-002(f) are summarized in Table 5.8-4. The lateral and vertical extent of COPCs at AOC 39-002(f) are evaluated in Appendix B, section B-2.6.5. The following sections summarize the results of that evaluation.

5.8.4.1 Inorganic Chemicals

The distribution of inorganic COPCs at AOC 39-002(f) is shown in Figure 5.8-2; the analytical results are presented in Table 5.8-2. Lateral and vertical extent are defined for all inorganic COPCs at this site.

5.8.4.2 Organic Chemicals

The distribution of organic COPCs at AOC 39-002(f) is shown in Figure 5.8-3; the analytical results are presented in Table 5.8-3. Lateral and vertical extent are defined for all organic COPCs at this site.

5.8.4.3 Radionuclides

There were no radionuclide COPCs at AOC 39-002(f).

5.8.5 Summary of Human Health and Ecological Risk Assessment Results

The COPCs for AOC 39-002(f) were evaluated using industrial and residential SSLs. No radionuclide COPCs were identified at this site. The total excess cancer risk of 1×10^{-9} for the industrial scenario is below the NMED target level of 1×10^{-5} (NMED 2009, 106420). The industrial HI of 0.003 is below the NMED target HI of 1.0 (NMED 2009, 106420). The total excess cancer risk of 7×10^{-7} is below NMED target level of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.04 is below the NMED target HI of 1.0 (NMED 2009, 106420). The ecological risk-screening assessment determined there are no ecological risks to receptors.

5.9 SWMU 39-004(c) Firing Site

5.9.1 Site Description and Operational History

SWMU 39-004(c), shown on Plate 1, is an active firing site and active operating RCRA open detonation (OD) site (structure 39-06) subject to RCRA closure requirements. The site is located in the southernmost western tributary of Ancho Canyon in the canyon bottom between an ephemeral stream and steep hill slopes to both the north and south. The site is used for explosives experiments and for treating hazardous waste by OD. The experiments conducted at this firing site are designed to expend all HE in the device. Use of this site as a test firing site began when TA-39 was established in 1953.

5.9.2 Historical Investigations

The Phase I RFI at SWMU 39-004(c) was implemented in 1995 (ICF Kaiser Engineers 1997, 097812, p. 74). To determine potential contaminant dispersion and migration from an explosives site, the investigation was conducted in two segments: (1) firing pad areas and (2) transects from the firing pads along the adjacent hillsides and mesa top.

Preliminary sampling involved sampling within an approximate 100-ft-diameter circle of the physical boundary of the firing pad. Radiation surveys and XRF screening were conducted at the firing pad as a

guide to selecting sampling locations. Where possible, the sampling locations were selected from the location of the two highest radiation and XRF results. A total of four surface sampling locations were selected from the areas around the firing pad at SWMU 39-004(c) (LANL 2007, 098281).

Twenty samples were collected from 10 locations along the adjacent stream channel, north and east of the site. Typically, each location was sampled at two depth intervals: one sample from the surface (0–0.5 ft) and the second from the depth interval of 0.5 to 0.83 ft bgs (LANL 2007, 098281).

Three transects were established at the site to determine the extent of dispersion. The firing pad was used as the hub, and the three transects were sampled outward to a distance of approximately 600 ft from the pad. A total of 17 total samples were collected from 10 locations along transects at this site (LANL 2007, 098281).

These data indicate inorganic chemicals, organic chemicals, and radionuclides are potential contaminants (ICF Kaiser Engineers 1997, 097812).

5.9.3 Sampling Analytical Results and COPC Identification

The locations sampled for SWMU 39-004(c) are shown in Figure 5.9-1. Table 5.9-1 summarizes samples collected and analytical requests for each sample.

Inorganic Chemicals

Table 5.9-2 lists the inorganic chemicals detected above BV or having detection limits above BV. Detected concentrations of inorganic chemicals above BVs are shown in Figure 5.9-2.

The identification of inorganic COPCs is presented in Appendix B, section B-2.7.1. The inorganic chemicals identified as COPCs at SWMU 39-004(c) are antimony, cadmium, copper, cyanide, mercury, selenium, silver, thallium, uranium, and zinc.

Organic Chemicals

Table 5.9-3 lists the organic chemicals detected at SWMU 39-004(c). Detected concentrations of organic chemicals are shown in Figure 5.9-3.

The identification of organic COPCs is presented in Appendix B, section B-2.7.2. The organic chemicals identified as COPCs at SWMU 39-004(c) are Aroclor-1248; Aroclor-1254; Aroclor-1260; benzoic acid; bis(2-chloroethyl)ether; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; di-n-butylphthalate; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; and RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine).

Radionuclides

Table 5.9-4 lists the radionuclides detected or detected above BV/FV. Activities of radionuclides detected or detected above BVs/FVs are shown in Figure 5.9-4.

The identification of radionuclide COPCs is presented in Appendix B, section B-2.7.3. The radionuclides identified as COPCs at SWMU 39-004(c) are plutonium-238, plutonium-239/240, sodium-22, thorium-228, thorium-230, thorium-232, uranium-234, uranium-235/236, and uranium-238.

5.9.4 Spatial Distribution of COPCs at SWMU 39-004(c)

SWMU 39-004(c) is an active firing site. The COPCs at SWMU 39-004(c) are summarized in Table 5.9-5. Contaminant distributions were evaluated primarily to determine what contaminants are being dispersed and whether they are migrating off-site. This evaluation is presented in Appendix B, section B-2.7.5. The following sections summarize the results of that evaluation.

5.9.4.1 Inorganic Chemicals

The distribution of inorganic COPCs at SWMU 39-004(c) is shown in Figure 5.9-2; the analytical results are presented in Table 5.9-2. The concentrations of inorganic COPCs were generally consistent across the site for those detected infrequently. For those detected more frequently, the concentrations decreased with distance from the firing site. Concentrations generally decreased with depth. These results, along with the results of the extended drainage sampling (Section 5.17.5), indicate that inorganic COPCs are not migrating off-site.

5.9.4.2 Organic Chemicals

The distribution of organic COPCs at SWMU 39-004(c) is shown in Figure 5.9-3; the analytical results are presented in Table 5.9-3. Organic COPCs were detected infrequently and at low concentrations (usually near the EQL). These results, along with the results of the extended drainage sampling (section 5.17.5), indicate that organic COPCs are not migrating from off-site.

5.9.4.3 Radionuclides

The distribution of radionuclide COPCs at SWMU 39-004(c) is shown in Figure 5.9-4; the analytical results are presented in Table 5.9-4. Radionuclide COPCs were detected infrequently (i.e., three or fewer samples), at relatively consistent concentrations, and with no clear spatial distribution. These results, along with the results of the extended drainage sampling (section 5.17.5), indicate radionuclide COPCs are not migrating from off-site.

5.9.5 Summary of Human Health and Ecological Risk-Assessment Results

This site is an active firing site that is impacted by continuing operations. Human health and ecological risk assessments were not conducted for active sites because operations are ongoing.

5.10 SWMU 39-004(d) Firing Sites

5.10.1 Site Description and Operational History

SWMUs 39-004(a) and 39-004(d), shown Plate 1, are active firing sites located along the northern tributary of the upper reach of Ancho Canyon at TA-39. SWMU 39-004(a) is deferred per Table IV-2 of the Consent Order. SWMU 39-004(d) is an active RCRA site subject to RCRA closure requirements as well as a test firing site.

Both these firing pads are located in the bottom of the canyon between a diverted ephemeral stream and the canyon wall. SWMU 39-004(a) was constructed in 1953 as a remote test firing facility to test explosives materials (ICF Kaiser Engineers 1997, 097812, pp. 4–5). SWMU 39-004(d) is located approximately 75 ft southeast of SWMU 39-004(a). The firing sites are within the fall zone of a high cliff

that erodes when explosives experiments are conducted at the site. A debris mound is located at the base of the canyon wall directly west of the firing pad at SWMU 39-004(a) (LANL 2007, 098281).

5.10.2 Historical Investigations

Planned historical investigations at these sites attempted to differentiate between SWMUs 39-004(a) and 39-004(d), but because of the nature of activities in this area, these two firing sites were sampled as one site. Phase I RFI activities were completed at SWMUs 39-004(a) and 39-004(d) in 1995 (ICF Kaiser Engineers 1997, 097812, pp. 4–5). Investigations were planned and conducted in two parts.

Initial sampling involved collecting samples from within the physical boundary of the firing pads (approximately within a 100-ft-diameter circle from a central point between the two firing pads). Radiation surveys and XRF screening were conducted at both firing pads to guide the selection of sampling locations. Where possible, sampling locations were selected from the areas of the two highest radiation and XRF survey results. Twelve surface samples were collected from 12 locations at SWMUs 39-004(a) and 39-004(d) within the firing pad area, including two samples collected from the debris pile west of the firing pad at SWMU 39-004(a) (LANL 2007, 098281).

Eighteen samples were collected from the adjacent stream channel in nine locations. Typically, each location was sampled at two depth intervals: the first was collected from the 0- to 0.5-ft interval and the second from the 0.5- to 0.83-ft interval (LANL 2007, 098281).

The firing sites were also sampled along three lines radiating outward from the pads. These lines are referred to as transects. To characterize the extent of contamination beyond the firing pads, three transects were sampled using a central point between the two firing pads as the hub. The transects radiated outward from the 100-ft-diameter circle encompassing the firing pads previously discussed to a distance of approximately 600 ft. Sixteen samples were collected from nine locations along the transects at SWMUs 39-004(a) and 39-004(d).

Sampling data showed HE, inorganic chemicals, organic chemicals, and radionuclides as potential contaminants.

5.10.3 Sampling Analytical Results and COPC Identification

The locations sampled for SWMU 39-004(d) are shown in Figure 5.10-1. Table 5.10-1 summarizes samples collected and analytical requests for each sample.

Table 5.10-2 lists the inorganic chemicals detected above BV or having detection limits above BV. Detected concentrations of inorganic chemicals above BVs are shown in Figure 5.10-2.

The identification of inorganic COPCs is presented in Appendix B, section B-2.8.1. The inorganic chemicals identified as COPCs at SWMU 39-004(d) are antimony, arsenic, barium, beryllium, cadmium, chromium, copper, cyanide, iron, lead, manganese, mercury, perchlorate, selenium, silver, thallium, and uranium.

Organic Chemicals

Table 5.10-3 lists the organic chemicals detected at SWMU 39-004(d). Detected concentrations of organic chemicals are shown in Figure 5.10-3.

The identification of organic COPCs is presented in Appendix B, section B-2.8.2. The organic chemicals identified as COPCs at SWMU 39-004(d) are 4-amino-2,6-dinitrotoluene; 2-amino-4,6-dinitrotoluene; anthracene; Aroclor-1260; bis(2-ethylhexyl)phthalate; chrysene; di-n-butylphthalate; octahyro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX); PETN; RDX; and TATB (triaminotrinitrobenzene).

Radionuclides

Table 5.10-4 lists the radionuclides detected or detected above BV/FV. Activities of radionuclides detected or detected above BVs/FVs are shown in Figure 5.10-4.

The identification of radionuclide COPCs is presented in Appendix B, section B-2.8.3. The radionuclides identified as COPCs at SWMU 39-004(d) are europium-52, sodium-22, thorium-228, thorium-230, thorium-232, uranium-234, uranium-235, uranium-235/236, and uranium-238.

5.10.4 Spatial Distribution of COPCs at SWMU 39-004(d)

SWMU 39-004(d) is an active firing site. The COPCs at SWMU 39-004(d) are summarized in Table 5.10-5. Contaminant distributions were evaluated primarily to determine what contaminants are being dispersed and whether they are migrating off-site. This evaluation is presented in Appendix B, section B-2.8.5. The following sections summarize the results of that evaluation.

5.10.4.1 Inorganic Chemicals

The distribution of inorganic COPCs at SWMU 39-004(d) is shown in Figure 5.10-2; the analytical results are presented in Table 5.10-2. The concentrations of inorganic COPCs were generally consistent across the site for those detected infrequently. For those detected more frequently, the concentrations decreased with distance from the firing site. Concentrations generally decreased with depth. These results, along with the results of the extended drainage sampling (section 5.17.5), indicate that inorganic COPCs are not migrating off-site.

5.10.4.2 Organic Chemicals

The distribution of organic COPCs at SWMU 39-004(d) is shown in Figure 5.10-3; the analytical results are presented in Table 5.10-3. Most organic COPCs were detected infrequently (one or two samples) at low concentrations (i.e., near the EQL). The compounds HMX and RDX were detected most frequently and at the highest concentrations. Concentrations of HMX and RDX decreased with distance from the firing site. These results, along with the results of the extended drainage sampling (section 5.17.5), indicate that organic COPCs are not migrating off-site.

5.10.4.3 Radionuclides

The distribution of radionuclide COPCs at SWMU 39-004(d) is shown in Figure 5.10-4; the analytical results are presented in Table 5.10-4. Gamma-emitting nuclides were detected infrequently (i.e., one to three samples). Thorium isotope activities were consistent around the site and all less than 2 times BV. The highest activities above BV were for uranium isotopes, and these activities decreased with distance from the firing site. These results, along with the results of the extended drainage sampling (section 5.17.5), indicate that radionuclide COPCs are not migrating off-site.

5.10.5 Summary of Human Health and Ecological Risk Assessment Results

This site is an active firing site impacted by continuing operations. Human health and ecological risk assessments were not conducted for active sites because operations are ongoing.

5.11 SWMU 39-005 Former HE Seepage Pit Site Description and Operational History

SWMU 39-005, shown on Plate 1, is the site of a former seepage pit used to dispose of HE-contaminated decant from operations at an explosives operations building (39-04). The seepage pit measured approximately 5 × 5 × 7 ft and was not lined or otherwise contained. The gravel and HE-contaminated soil that comprised the pit were removed in 1986 (LANL 1993, 015316, p. 5-42).

5.11.1 Historical Investigations

A 1993 RFI was conducted at SWMU 39-005 to ensure that no residual HE materials were present after the seepage pit had been removed (LANL 1995, 046190, p. 4-66). Because the exact location of the former pit was not known, samples were collected from the location believed to have been the most likely site of the pit and from a location downgradient of the presumed location. Five samples were collected at each of the two locations in 3-ft intervals to a depth of 12 ft bgs and were analyzed for HE. HE was not detected in any of the samples (LANL 1995, 046190, p. 4-66).

5.11.2 Field Screening for TNT, RDX, and Metals

There were no detections of TNT or RDX in the samples field screened for this site. The XRF results for metals are presented in Appendix D. All metal samples collected at SWMU 39-005 were submitted for off-site analysis instead of just 30% as stated in the approved investigation work plan (LANL 2007, 101894; NMED 2007, 098948),

5.11.3 Sampling Analytical Results and COPC Identification

The locations sampled for SWMU 39-005 are shown in Figure 5.11-1. Table 5.11-1 summarizes samples collected and analytical requests for each sample.

Inorganic Chemicals

Table 5.11-2 lists the inorganic chemicals detected above BV or having detection limits above BV. Detected concentrations of inorganic chemicals above BVs are shown in Figure 5.11-2.

The identification of inorganic COPCs is presented in Appendix B, section B-2.9.1. The inorganic chemicals identified as COPCs at SWMU 39-005 are arsenic, cyanide, chromium, copper, mercury, nickel, and selenium.

Organic Chemicals

Table 5.11-3 lists the organic chemicals detected at SWMU 39-005. Detected concentrations of organic chemicals are shown on Plate 3.

The identification of organic COPCs is presented in Appendix B, section B-2.9.2. The organic chemicals identified as COPCs at SWMU 39-005 are 3,5-dinitroaniline; acenaphthene; acetone; 4-amino-2,6-dinitrotoluene; 2-amino-4,6-dinitrotoluene; anthracene; Aroclor-1254, benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bromomethane;

chrysene; dibenzofuran; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 2-hexanone; indeno(1,2,3-c,d)pyrene; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; phenanthrene, pyrene; RDX; 2,3,7,8-tetrachlorodibenzodioxin; 1,3,5-trinitrobenzene; and 2,4,6-trinitrotoluene.

Radionuclides

Table 5.11-4 lists the radionuclides detected or detected above BV/FV. Activities of radionuclides detected or detected above BVs/FVs are shown in Figure 5.11-3.

The identification of radionuclide COPCs is presented in Appendix B, section B-2.9.3. The radionuclides identified as COPCs at SWMU 39-005 are plutonium-238, tritium, uranium-234, uranium-235/236, and uranium-238.

5.11.4 Spatial Distribution of COPCs at SWMU 39-005

The COPCs at SWMU 39-005 are summarized in Table 5.11-5. The lateral and vertical extent of COPCs at SWMU 39-005 are evaluated in Appendix B, section B-2.9.5. The following sections summarize the results of that evaluation.

5.11.4.1 Inorganic Chemicals

The distribution of inorganic COPCs at SWMU 39-005 is shown in Figure 5.11-2; the analytical results are presented in Table 5.11-2. Lateral and vertical extent are defined for all inorganic COPCs.

5.11.4.2 Organic Chemicals

The distribution of organic COPCs at SWMU 39-005 is shown on Plate 3; the analytical results are presented in Table 5.11-3. Lateral and vertical extent are defined for all organic COPCs.

5.11.4.3 Radionuclides

The distribution of radionuclide COPCs at SWMU 39-005 is shown in Figure 5.11-3; the analytical results are presented in Table 5.11-4. Lateral and vertical extent are defined for all radionuclide COPCs.

5.11.5 Summary of Human Health and Ecological Risk Assessment Results

The COPCs for SWMU 39-005 were evaluated using both industrial and residential SSLs and SALs. The total excess cancer risk of 5×10^{-6} for the industrial scenario is below the NMED target level of 1×10^{-5} (NMED 2009, 106420). The industrial HI of 0.003 is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose of 0.14 mrem/yr for the industrial scenario is below DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total excess cancer risk of 1×10^{-5} for the residential scenario is equivalent to the NMED target level of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.4 is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose of 0.86 mrem/yr for the residential scenario is below DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The ecological risk-screening assessment determined there are no ecological risks to receptors.

5.12 SWMU 39-006(a) Septic System Active Components

5.12.1 Site Description and Operational History

SWMU 39-006(a), shown on Plate 1, consists of both active and inactive components of a septic system. This section focuses primarily on the active components, while section 2.10.4 describes the inactive components in more detail. The active components of SWMU 39-006(a) consist of an outfall, an active septic system (structure 39-104), and an active sand filter that replaced the inactive septic system.

SWMU 39-006(a) is an 1800-gal. septic tank reinforced with concrete (structure 39-12), associated drainlines, and an inactive subsurface sand filter constructed to dispose of photographic processing chemicals. The tank was connected to the now inactive sand filter by approximately 260 ft of VCP, which discharged to an outfall in Ancho Canyon. The sand filter is located next to the east side of the ephemeral stream channel in an open area south of the new (active) septic tank (structure 39-104) (LANL 2007, 098281).

Photographic processing chemicals were routinely disposed of in the system at a rate of approximately 65 gal./yr, eventually causing the system to malfunction. To correct the problem, a separate seepage pit was used in 1973 to dispose of the photographic processing chemicals, and it handled approximately 75 gal./yr until 1992 (LANL 2007, 098281). The chemical seepage pit consisted of an open pit approximately 12 ft deep and filled with cobble. A corrugated pipe approximately 1 ft in diameter runs vertically through the center of the seepage pit.

At the same time, septic tank 39-12 was enlarged, and a new subsurface sand filter was installed on the south side of NM 4, and use of the old sand filter was discontinued. By 1978, the new sand filter became clogged and was replaced. In 1985, use of septic tank 39-12 was discontinued. Waste was removed from the tank, and the tank was filled with sand. A new 2500-gal. precast concrete septic tank (structure 39-104) and drainline were installed, with the new drainline running through the original tank (structure 39-12). The new septic system serves several buildings at TA-39 in addition to building 39-02. The sand filter south of NM 4 was also redesigned and replaced, the second sand filter replacement in 12 yr. New piping was added and tied into the existing 4-in. line under the highway to avoid tearing up the road. In about 1989, the outfall from the new sand filter was plugged, eliminating discharge into the canyon (LANL 1995, 046190, pp. 4-41 to 4-45).

5.12.2 Historical Investigations

During the 1993 RFI, each component of this SWMU was sampled (LANL 1995, 046190, p. 4-41 to 4-66). The active sand filter was sampled at three locations at three depths (0–0.5, 4, and 6 ft bgs) along the center line of the sand filter, resulting in a total of nine samples collected. The active septic tank (structure 39-104) was sampled by drilling a borehole next to, and downgradient of, the tank. Samples were collected at depths of 0–1.5, 9, and 11 ft bgs.

The outfall was sampled in the drainage channel at 6 and 15 ft south of the discharge point. Outfall samples were collected from both the surface soil and from 4 ft bgs in the drainage channel (LANL 2007, 098281).

5.12.3 Sampling Analytical Results and COPC Identification

The locations sampled for SWMU 39-006(a) active components are shown in Figure 5.12-1. Table 5.12-1 summarizes samples collected and analytical requests for each sample.

Inorganic Chemicals

Table 5.12-2 lists the inorganic chemicals detected above BV or having detection limits above BV. Detected concentrations of inorganic chemicals above BVs are shown in Figure 5.12-2.

The identification of inorganic COPCs is presented in Appendix B, section B-2.10.1. The only inorganic chemical identified as a COPC the SWMU 39-006(a) active components is mercury.

Organic Chemicals

Table 5.12-3 lists the organic chemicals detected for the SWMU 39-006(a) active components. Detected concentrations of organic chemicals are shown in Figure 5.12-3.

The identification of organic COPCs is presented in Appendix B, section B-2.10.2. The organic chemicals identified as COPCs the SWMU 39-006(a) active components are 4-amino-2,6-dinitrotoluene, bis(2-ethylhexyl)phthalate; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; and 1,2,3,4,6,7,8,9-octachlorodibenzofuran.

Radionuclides

No radionuclides detected or detected above BV/FV for the SWMU 36-006(a) active components.

5.12.4 Spatial Distribution of COPCs at SWMU 39-006(a) Active Components

The COPCs at SWMU 39-006(a) active components are summarized in Table 5.12-4. The lateral and vertical extent of COPCs at SWMU 39-006(a) active components are evaluated in Appendix B, section B-2.10.5. The following sections summarize the results of that evaluation.

5.12.4.1 Inorganic Chemicals

The distribution of inorganic COPCs at SWMU 39-006(a) active components is shown in Figure 5.12-2; the analytical results are presented in Table 5.12-2. Lateral and vertical extent are defined for mercury, which was the only inorganic COPC.

5.12.4.2 Organic Chemicals

The distribution of organic COPCs at SWMU 39-006(a) active components is shown in Figure 5.12-3; the analytical results are presented in Table 5.12-3. Lateral and vertical extent are defined for all organic COPCs.

5.12.4.3 Radionuclides

There were no radionuclide COPCs at SWMU 39-006(a) active components.

5.12.5 Summary of Human Health and Ecological Risk Assessment Results

The COPCs for SWMU 39-006(a) active components were evaluated using both industrial and residential SSLs. No radionuclide COPCs were identified at this site. The total excess cancer risk of 6×10^{-9} for the industrial scenario is below the NMED target level of 1×10^{-5} (NMED 2009, 106420). The industrial HI of 0.002 is below the NMED target HI of 1.0 (NMED 2009, 106420). The total excess cancer risk of 3×10^{-8}

for the residential scenario is below the NMED target for risk of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.03 is below the NMED target HI of 1.0 (NMED 2009, 106420). The ecological risk-screening assessment determined there are no ecological risks to receptors.

5.13 SWMU 39-007(a) Former Storage Area

5.13.1 Site Description and Operational History

SWMU 39-007(a) (Plate 1) is a former storage area located on a concrete pad under a covered porch outside the northeast corner of an equipment shelter (structure 39-63) at TA-39. The dates of operation of the storage area are not known. Used oil containing lead and solvents was stored at this storage area. The area around the concrete pad is relatively flat but slopes eastward to a drainage near the adjacent road.

5.13.2 Historical Investigations

Three surface samples (0–0.5 ft) were collected from three locations within a few feet of the concrete pad during the 1993 Phase I RFI (LANL 1995, 046190, p. 4-32). One sample was collected at the southeast corner of the building, and two were collected from the area most likely to receive runoff from the pad. PCBs (Aroclor-1248, Aroclor-1254, and Aroclor-1260) were detected at the site, and a VCA was recommended in the 1995 RFI report (LANL 1995, 046190, p. 4-36).

A VCA was conducted at this site in 1995 to remediate PCB contamination detected during the 1993 Phase I RFI (LANL 1996, 053786, p. 1). A portion of the site was excavated, and confirmation samples were collected within and next to the excavated area. Confirmation samples showed PCB contamination was still present above cleanup levels in a localized area; additional soil was excavated from this area. Confirmation samples collected following the second excavation showed the VCA was successful and resulted in PCB concentrations less than 1.0 mg/kg at the site (LANL 1996, 053786, p. 2). After the VCA was completed, the site was backfilled and seeded with native grasses.

In 2001, five surface soil samples were collected from five locations. PCBs, specifically Aroclor-1254 and Aroclor-1260, were detected as were inorganic chemicals above BV. Samples were not analyzed for radionuclides. Documentation is not available explaining the reason for this additional investigation; however, these results are included in the approved investigation work plan (LANL 2007, 101894; NMED 2007, 098948).

5.13.3 Field Screening for PCBs and Metals

Four locations at SWMU 39-007(a) had detections of PCBs in the field-screened samples. These locations (39-604859, 39-604860, 39-604854, and 39-604861) had concentrations of PCBs ranging from 1.1 ppm to 19.7 ppm. All samples with detected PCBs were submitted for off-site analysis. The XRF results for metals were reviewed, and samples were collected in locations with high detections of zinc for off-site analysis. (Zinc was the only COPC from historical data that was also detected by XRF at this site.) The results for the field screening of all samples are presented in Appendix D.

5.13.4 Sampling Analytical Results and COPC Identification

The locations sampled for SWMU 39-007(a) are shown in Figure 5.13-1. Table 5.13-1 summarizes samples collected and analytical requests for each sample.

Inorganic Chemicals

Table 5.13-2 lists the inorganic chemicals detected above BV or having detection limits above BV. Detected concentrations of inorganic chemicals above BVs are shown in Figure 5.13-2.

The identification of inorganic COPCs is presented in Appendix B, section B-2.11.1. The inorganic chemicals identified as COPCs at SWMU 39-007(a) are antimony, cadmium, cyanide, and perchlorate.

Organic Chemicals

Table 5.13-3 lists the organic chemicals detected at SWMU 39-007(a). Detected concentrations of organic chemicals are shown in Figure 5.13-3.

The identification of organic COPCs is presented in Appendix B, section B-2.11.2. The organic chemicals identified as COPCs at SWMU 39-007(a) are acetone; Aroclor-1242; Aroclor-1248; Aroclor-1254; Aroclor-1260; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; chrysene; 1,4-dichlorobenzene; ethylbenzene; fluoranthene; isopropylbenzene; 4-isopropyltoluene; phenanthrene; pyrene; and toluene.

Radionuclides

No radionuclides detected or detected above BV/FV for SWMU 36-007(a).

5.13.5 Spatial Distribution of COPCs at SWMU 39-007(a)

The COPCs at SWMU 39-007(a) are summarized in Table 5.13-4. The lateral and vertical extent of COPCs at SWMU 39-007(a) are evaluated in Appendix B, section B-2.11.5. The following sections summarize the results of that evaluation.

5.13.5.1 Inorganic Chemicals

The distribution of inorganic COPCs at SWMU 39-007(a) is shown in Figure 5.13-2; the analytical results are presented in Table 5.13-2. Lateral and vertical extent are defined for all inorganic COPCs.

5.13.5.2 Organic Chemicals

The distribution of organic COPCs at SWMU 39-007(a) is shown in Figure 5.13-3; the analytical results are presented in Table 5.13-3. Lateral and vertical extent are defined for all organic COPCs.

5.13.5.3 Radionuclides

There were no radionuclide COPCs at SWMU 39-007(a).

5.13.6 Summary of Human Health and Ecological Risk Assessment Results

The COPCs for SWMU 39-007(a) were evaluated using both industrial and residential SSLs. No radionuclide COPCs were identified at this site. The total excess cancer risk of 4×10^{-5} for the industrial scenario is above the NMED target level of 1×10^{-5} (NMED 2009, 106420). The industrial HI of 0.002 is below the NMED target HI of 1.0 (NMED 2009, 106420). The total excess cancer risk of 3×10^{-5} for the residential scenario is above the NMED target level of 1×10^{-5} (NMED 2009, 106420). The residential HI of 2 exceeds the NMED target HI of 1.0 (NMED 2009, 106420). The potential unacceptable risks for both

scenarios are primarily from Aroclor-1254 and Aroclor-1260. The ecological risk-screening assessment determined there are no ecological risks to receptors.

5.14 AOC 39-007(d) Storage Area

5.14.1 Site Description and Operational History

AOC 39-007(d), shown on Plate 1, is a storage area (structure 39-142) located at the south end of Subaggregate Area 2. The storage area consists of a bermed asphalt pad covered with a metal roof. A valved drainpipe discharges stormwater from the bermed area across the access road toward the Ancho Road drainage (LANL 1993, 015316, p. 5-20). The area was initially used to store metal and an occasional drum of silicon transformer oil. Later it became an SAA where chemicals, including dielectric fluid, ethylene glycol, solvents, and kerosene, were stored. The SAA was removed in the 1990s, but the storage area continues to be used to store nonhazardous materials such as cable and wire.

5.14.2 Historical Investigations

In 1993, five surface soil samples were collected and analyzed for organic chemicals, inorganic chemicals and radionuclides (LANL 1995, 046190, p. 4-37). One organic chemical was detected, and one radionuclide was detected above FV.

5.14.3 Sampling Analytical Results and COPC Identification

The locations sampled for AOC 39-007(d) are shown in Figure 5.14-1. Table 5.14-1 summarizes samples collected and analytical requests for each sample.

Inorganic Chemicals

Table 5.14-2 lists the inorganic chemicals detected above BV or having detection limits above BV. Detected concentrations of inorganic chemicals above BVs are shown in Figure 5.14-2.

The identification of inorganic COPCs is presented in Appendix B, section B-2.12.1. The inorganic chemicals identified as COPCs at AOC 39-007(d) are antimony, cadmium, cyanide, perchlorate, and zinc.

Organic Chemicals

Table 5.14-3 lists the organic chemicals detected at AOC 39-007(d). Detected concentrations of organic chemicals are shown in Figure 5.14-3.

The identification of organic COPCs is presented in Appendix B, section B-2.12.2. The organic chemicals identified as COPCs at AOC 39-007(d) are acetone; anthracene; Aroclor-1242; Aroclor-1254; benzo(a)pyrene; bis(2-ethylhexyl)phthalate; bromomethane; diphenylamine; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; toluene; trichlorofluoromethane; 1,2,4-trimethylbenzene; and 1,3,5-trimethylbenzene.

Radionuclides

Table 5.14-4 lists the radionuclides detected or detected above BV/FV. Activities of radionuclides detected or detected above BVs/FVs are shown in Figure 5.14-4.

The identification of radionuclide COPCs is presented in Appendix B, section B-2.12.3. The radionuclides identified as COPCs at AOC 39-007(d) are plutonium-239/240 and tritium.

5.14.4 Spatial Distribution of COPCs at AOC 39-007(d)

The COPCs at AOC 39-007(d) are summarized in Table 5.14-5. The lateral and vertical extent of COPCs at AOC 39-007(d) are evaluated in Appendix B, section B-2.12.5. The following sections summarize the results of that evaluation.

5.14.4.1 Inorganic Chemicals

The distribution of inorganic COPCs at AOC 39-007(d) is shown in Figure 5.14-2; the analytical results are presented in Table 5.14-2. Lateral and vertical extent are defined for all inorganic COPCs.

5.14.4.2 Organic Chemicals

The distribution of organic COPCs at AOC 39-007(d) is shown in Figure 5.14-3; the analytical results are presented in Table 5.14-3. Lateral and vertical extent are defined for all organic COPCs.

5.14.4.3 Radionuclides

The distribution of radionuclide COPCs at AOC 39-007(d) is shown in Figure 5.14-4; the analytical results are presented in Table 5.14-4. Lateral and vertical extent are defined for all radionuclides.

5.14.5 Summary of Human Health and Ecological Risk Assessment Results

The COPCs for AOC 39-007(d) were evaluated using both industrial and residential SSLs and SALs. The total excess cancer risk of 1×10^{-6} for the industrial scenario is below the NMED target level of 1×10^{-5} (NMED 2009, 106420). The industrial HI of 0.007 is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose of 0.01 mrem/yr for the industrial scenario is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total excess cancer risk of 6×10^{-6} for the residential scenario is below NMED target level of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.4 is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose of 0.08 mrem/yr for the residential scenario is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The ecological risk-screening assessment determined there are no ecological risks to receptors.

5.15 SWMU 39-008 Gas-Gun Site

5.15.1 Site Description and Operational History

SWMU 39-008, shown on Plate 1, is an area of potential soil contamination from a gas-gun firing site near a Morgan shed (building 39-137) that houses a single-stage gas-gun with a 6-in.-diameter barrel. The gas-gun is used for outdoor experiments; gas is used as a propellant to fire-depleted uranium projectiles at targets on the cliff face (LANL 1993, 015316, p. 5-26). Testing at this site was conducted from 1960 to 1975, suspended for 13 yr, and then resumed in 1988 (LANL 1993, 015316, p. 5-26). Most of the debris from the gas-gun firings is scattered over the area just west of the building, but occasionally projectiles

and target fragments hit the cliff face, which is situated approximately 200 ft west of another building associated with this experimental gun (building 39-56). Photographic evidence shows that the area between the buildings and the cliff has been leveled, and the removed surface materials were pushed into a mound on the south side of the test area. The gas gun is currently used for experimental purposes.

5.15.2 Historical Investigations

During the 1993 Phase I RFI, a grid was established over the entire site, and a radiation survey was conducted (ICF Kaiser Engineers 1997, 097812, p. 94). Results of the radiation survey were used to guide sample collection at SWMU 39-008 in 1995. The objective of the investigation was to determine if contaminants were present in the soil in the area around the gas-gun building (39-137), the leveled area, the cliff backstop, and the debris mound.

Surface (0–6 in.) and near-surface (6–10 in.) soil samples were collected from six locations between the gas-gun building and the cliff face (leveled area). Two sampling locations were based upon elevated radiation readings. The remaining sample locations were evenly spaced between the gas-gun building and the cliff face. Four sampling locations were established on the debris mound (ICF Kaiser Engineers 1997, 097812, p. 95) and were sampled at two depth intervals. One surface sample was collected from a local drainage at the northern end of the site.

Sampling data showed inorganic and organic chemicals and radionuclides as potential contaminants (ICF Kaiser Engineers 1997, 097812).

5.15.3 Sampling Analytical Results and COPC Identification

Inorganic Chemicals

The locations sampled for SWMU 39-008 are shown in Figure 5.15-1. Table 5.15-1 summarizes samples collected and analytical requests for each sample.

Table 5.15-2 lists the inorganic chemicals detected above BV or having detection limits above BV. Detected concentrations of inorganic chemicals above BVs are shown in Figure 5.15-2.

The identification of inorganic COPCs is presented in Appendix B, section B-2.13.1. The inorganic chemicals identified as COPCs at SWMU 39-008 are antimony, barium, cadmium, chromium, cyanide, iron, lead, manganese, mercury, nickel, selenium, silver, thallium, uranium, and zinc.

Organic Chemicals

Table 5.15-3 lists the organic chemicals detected at SWMU 39-008. The detected concentrations of organic chemicals are shown in Figure 5.15-3.

The identification of organic COPCs is presented in Appendix B, section B-2.13.2. The organic chemicals identified as COPCs at SWMU 39-008 are Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzyl alcohol; bis(2-ethylhexyl)phthalate; chrysene; di-n-butylphthalate; 1,2-dichloroethane; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; 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; 4-isopropyltoluene, 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; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; trichlorofluoromethane; 1,3,5-trimethylbenzene; and tris(o-cresyl)phosphate.

Radionuclides

Table 5.15-4 lists the radionuclides detected or detected above BV/FV. Activities of radionuclides detected or detected above BVs/FVs are shown in Figure 5.15-4.

The identification of radionuclide COPCs is presented in Appendix B, section B-2.13.3. The radionuclides identified as COPCs at SWMU 39-008 are americium-241, cesium-137, plutonium-239/240, thorium-228, thorium-230, thorium-232, tritium, uranium-235, uranium-235/236, and uranium-238.

5.15.4 Spatial Distribution of COPCs at SWMU 39-008

SWMU 39-008 is an active firing site. The COPCs at SWMU 39-008 are summarized in Table 5.15-5. Contaminant distributions were evaluated primarily to determine what contaminants are being dispersed and whether they are migrating off-site if extent cannot be determined. This evaluation is presented in Appendix B, section B-2.13.5. The following sections summarize the results of that evaluation.

5.15.4.1 Inorganic Chemicals

The distribution of inorganic COPCs at SWMU 39-008 is shown in Figure 5.15-2; the analytical results are presented in Table 5.15-2. Most inorganic COPCs were detected infrequently and lateral and vertical extent are defined for all inorganic COPCs except uranium. The highest concentrations of uranium were detected near the center of the site and decreased outward. These results, along with the results of the extended drainage sampling, indicate inorganic COPCs are not migrating off-site.

5.15.4.2 Organic Chemicals

The distribution of organic COPCs at SWMU 39-008 is shown in Figure 5.15-3; the analytical results are presented in Table 5.15-3. Lateral and vertical extent are defined for all organic COPCs.

5.15.4.3 Radionuclides

The distribution of radionuclide COPCs at SWMU 39-008 is shown in Figure 5.15-4; the analytical results are presented in Table 5.14-4. Americium-241, cesium-137, and plutonium-239/240 were detected infrequently (i.e., one to three samples). Thorium isotope activities were consistent around the site and all only slightly BV. The highest activities above BV were for uranium isotopes. Uranium activities were highest near the center of the site and decreased outward. These results, along with the results of the extended drainage sampling (section 5.17.5), indicate that radionuclide COPCs are not migrating off-site.

5.15.5 Summary of Human Health and Ecological Risk Assessment Results

This site is an active firing site impacted by continuing operations. Human health and ecological risk assessments were not conducted for active sites because operations are ongoing.

5.16 SWMU 39-010 Excavated Soil Dump

5.16.1 Site Description and Operational History

SWMU 39-010 (Plate 1) is an area that was used for staging soil excavated during the 1978 construction of a firing site [SWMU 39-004(e)]. This soil staging area is located at the south end of Subaggregate Area 1. During construction of the firing site, large quantities of soil were removed and deposited in the canyon east of the firing site, forming SWMU 39-010 (LANL 1993, 015316). This soil dump, covering approximately 76,200 ft^2, was not identified in the 1990 SWMU report (LANL 1990, 007512). However, it was noted in both the RFI work plan (LANL 1993, 015316, p. 5-24) and described in a letter notification to NMED designating a new SWMU (LANL 2001, 071215).

Data are not available concerning potential contaminants associated with the excavated soil that was placed at this site, but potential contaminants at this site are expected to be similar to SWMU 39-004(e) (i.e., HE, radionuclides, and inorganic chemicals) (LANL 1993, 015316, p. 5-26).

5.16.2 Historical Investigations

SWMU 39-010 has not been previously investigated.

5.16.3 Field Screening for Metals, PCBs, TNT, and RDX

There were no detections of PCBs or TNT in the samples field screened for SWMU 39-010. RDX was detected in samples from four locations (39-604431, 39-604432, 39-604439, and 39-604441) at concentrations ranging from 0.7 ppm to 27 ppm. All samples with detected concentrations of RDX were submitted for off-site analysis. The XRF results for samples with high detections of uranium, lead, and zinc were submitted for off-site analysis. The results for the field screening of all samples are presented in Appendix D.

5.16.4 Soil, Tuff, and Sediment Sampling Analytical Results and COPC Identification

The locations sampled for SWMU 39-010 are shown in Figure 5.16-1. Table 5.16-1 summarizes samples collected and analytical requests for each sample.

Inorganic Chemicals

Table 5.16-2 lists the inorganic chemicals detected above BV or having detection limits above BV. Detected concentrations of inorganic chemicals above BVs are shown in Figure 5.16-2.

The identification of inorganic COPCs is presented in Appendix B, section B-2.14.1. The inorganic chemicals identified as COPCs at SWMU 39-010 are aluminum, antimony, arsenic, barium, cadmium, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, perchlorate, selenium, vanadium, and zinc.

Organic Chemicals

Table 5.16-3 lists the organic chemicals detected at SWMU 39-010. Detected concentrations of organic chemicals are shown in Figure 5.16-3.

The identification of organic COPCs is presented in Appendix B, section B-2.14.2. The organic chemicals identified as COPCs at SWMU 39-010 are 4-amino-2,6-dinitrotoluene; 2-amino-4,6-dinitrotoluene; 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,

chloromethane; chrysene; di-n-butylphthalate; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; 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; 2-hexanone; HMX; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; phenanthrene; pyrene; RDX; 1,3,5-trimethylbenzene; and 2,4,6-trinitrotoluene.

Radionuclides

Table 5.16-4 lists the radionuclides detected or detected above BV/FV. Activities of radionuclides detected or detected above BVs/FVs are shown in Figure 5.16-4.

The identification of radionuclide COPCs is presented in Appendix B, section B-2.14.3. The radionuclides identified as COPCs at SWMU 39-010 are cesium-137, tritium, uranium-234, uranium-235/236, and uranium-238.

5.16.5 Spatial Distribution of COPCs at SWMU 39-010

The COPCs at SWMU 39-010 are summarized in Table 5.16-5. The lateral and vertical extent of COPCs at SWMU 39-010 are evaluated in Appendix B, section B-2.14.5. The following sections summarize the results of that evaluation.

5.16.5.1 Inorganic Chemicals

The distribution of inorganic COPCs at SWMU 39-010 is shown in Figure 5.16-2; the analytical results are presented in Table 5.16-2. Lateral and vertical extent are defined for all inorganic COPCs except copper, lead, and mercury. The lateral extent of copper, lead, and mercury is defined, but vertical extent is not defined at several locations.

5.16.5.2 Organic Chemicals

The distribution of organic COPCs at SWMU 39-010 is shown in Figure 5.16-3; the analytical results are presented in Table 5.16-3. Lateral and vertical extent are defined for all organic COPCs except benzo(a)pyrene, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, and HMX. The lateral extent of these four organic COPCs is defined, but vertical extent is not defined at one or more locations.

5.16.5.3 Radionuclides

The distribution of radionuclide COPCs at SWMU 39-010 is shown in Figure 5.16-4; the analytical results are presented in Table 5.16-4. Lateral and vertical extent are defined for cesium-137 and tritium but are not defined for uranium isotopes (uranium-234, uranium-235/236, and uranium-238).

5.16.6 Summary of Human Health and Ecological Risk Assessment Results

The COPCs for SWMU 39-010 were evaluated using both industrial and residential SSLs and SALs. The total excess cancer risk of 7×10^{-7} for the industrial scenario is below the NMED target level of 1×10^{-5} (NMED 2009, 106420). The industrial HI of 0.06 is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose of 1.3 mrem/yr for the industrial scenario is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total excess cancer risk of 1×10^{-5} for the residential scenario is

equivalent to the NMED target level of 1 x 10^{-5} (NMED 2009, 106420). The residential HI of 0.4 is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose of 6.1 mrem/yr for the residential scenario is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The ecological risk-screening assessment determined there are no ecological risks to receptors.

5.17 Extended Drainages

5.17.1 Site Description and Operational History

The extended drainages consist of the drainage channels next to the sites under investigation as well as the main drainage channel running through North Ancho Canyon. The extended drainages are not a SWMU or AOC but are included in this investigation to assess the potential for off-site migration of contamination from the sites under investigation.

5.17.2 Historical Investigations

No soil or sediment investigations have been conducted in this aggregate area to date. Soil and sediment sampling is scheduled to occur when the South Canyons work plan is implemented. Available stormwater data collected in the extended drainages are included in Appendix F of this report.

5.17.3 Field Screening for Metals, PCBs, TNT, and RDX

PCBs were detected in three locations (39-604598, 39-604623, and 39-604658) in the extended drainages at concentrations between 0.6 ppm and 1.6 ppm. All screening samples with detected PCBs were submitted for laboratory analysis. Concentrations of TNT were detected at eight locations; samples collected from six of these locations (39-604553, 39-604567, 39-604581, 39-604589, 39-604665, and 39-604667) were submitted for laboratory analysis. The TNT concentrations in the field-screening results ranged from 0.7 ppm to 3 ppm. RDX was detected at seven locations (39-604543, 39-604598, 39-604536, 39-604540, 39-604672, 39-604655, and 39-604678) at concentrations from 0.7 ppm to 6.5 ppm. All samples with detected concentrations of RDX were submitted for off-site laboratory analysis. The XRF results for samples with high detections of uranium, arsenic, copper, and chromium were submitted for off-site analysis to ensure that a minimum of 30% of the total number of samples was analyzed by an off-site laboratory per the approved investigation work plan.

5.17.4 Sampling Analytical Results and COPC Identification

The locations sampled for the extended drainages are shown on Plates 4, 5, and 6. Table 5.17-1 summarizes samples collected and analytical requests for each sample.

Inorganic Chemicals

Table 5.17-2 lists the inorganic chemicals detected above BV or having detection limits above BV. Detected concentrations of inorganic chemicals above BVs are shown on Plates 7, 8, and 9.

The identification of inorganic COPCs is presented in Appendix B, section B-2.15.1. The inorganic chemicals identified as COPCs for the extended drainages are antimony, arsenic, cadmium, copper, cyanide, lead, mercury, perchlorate, selenium, and zinc.

Organic Chemicals

Table 5.17-3 lists the organic chemicals detected in the extended drainages. The sampling locations and detected concentrations of organic chemicals are shown on Plates 10, 11, and 12.

The identification of organic COPCs is presented in Appendix B, section B-2.15.2. The organic chemicals identified as COPCs for the extended drainages are acenaphthene; acetone; anthracene; Aroclor-1242; 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; chloromethane; chrysene; di-n-butylphthalate; dibenz(a,h)anthracene; 1,2-dichlorobenzene; 1,4-dichlorobenzene; 2,4-dinitrotoluene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; HMX; indeno(1,2,3-cd)pyrene; iodomethane; 4-isopropyltoluene; methylene chloride; 4-nitrotoluene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; phenanthrene; pyrene; RDX; styrene; TATB; toluene; trichlorofluoromethane; 1,2,4-trimethylbenzene; and 2,4,6-trinitrotoluene.

Radionuclides

Table 5.17-4 lists the radionuclides detected or detected above BV/FV. The sampling locations and activities of radionuclides detected or detected above BVs/FVs are shown on Plates 13, 14, and 15.

The identification of radionuclide COPCs is presented in Appendix B, section B-2.15.3. The radionuclides identified as COPCs for the extended drainages are tritium, uranium-234, uranium-235/236, and uranium-238.

5.17.5 Spatial Distribution of COPCs in the Extended Drainages

The COPCs in the extended drainages are summarized in Table 5.17-5. The inorganic and organic chemical and radionuclide distributions in soil and sediment in the extended drainages are summarized in the following sections. Samples were collected from three areas (northern, central, and southern) along the North Ancho Canyon drainage. Samples were collected along a transect at three points (one on each stream bank and one along the centerline of the channel). Appendix B discusses the extent of contamination at this site. The extended drainages were sampled to evaluate whether contaminants are migrating off-site from active firing sites for which only a preliminary characterization was performed. The distribution of contaminants in extended drainage samples is evaluated in Appendix B, section B-2.15.5. The following sections summarize the results of that evaluation.

5.17.5.1 Inorganic Chemicals

The distribution of inorganic COPCs in the extended drainages is shown on Plates 7, 8, and 9; the analytical results are presented in Table 5.17-2. The extent of all inorganic COPCs is defined in terms of concentrations that decreased in a downstream direction. The highest concentrations were generally observed near the active firing sites, and concentrations at the downstream site boundary were generally at background levels.

5.17.5.2 Organic Chemicals

The distribution of organic COPCs in the extended drainages is shown on Plates 10, 11, and 12; the analytical results are presented in Table 5.17-3. The extent of all organic COPCs is defined because concentrations decrease away from source areas. Concentrations at the downstream site boundary were generally below the EQL.

5.17.5.3 Radionuclides

The distribution of radionuclide COPCs in the extended drainages is shown on Plates 13, 14, and 15; the analytical results are presented in Table 5.17-4. The extent of all radionuclide COPCs is defined because

activities decrease away from source areas. The highest activities of uranium isotopes detected above background occurred near the active firing sites. Activities at the downstream site boundary were generally at background levels.

5.17.6 Summary of Human Health and Ecological Risk Assessment Results

The COPCs for the extended drainages were evaluated using both recreational and residential SSLs and SALs. The total excess cancer risk of 1×10^{-6} for the recreational scenario is below the NMED target level of 1×10^{-5} (NMED 2009, 106420). The recreational HI of 0.07 is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose of 0.11 mrem/yr for the recreational scenario is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total excess cancer risk of 9×10^{-6} for the residential scenario is below the NMED target level of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.4 is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose of 2.3 mrem/yr for the residential scenario is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The ecological risk-screening assessment determined there are no ecological risks to receptors.

5.18 SWMU 39-001(a) Inactive Landfill

5.18.1 Site Description and Operational History

SWMU 39-001(a), shown on Plate 1, is located east and north of the light gas-gun facility (building 39-69). Anecdotal evidence from long-time site workers before the 1997 RFI was conducted suggested that SWMU 39-001(a) consisted of two 80- × 20- × 10-ft-deep rectangular trenches (LANL 1997, 055633, p. 5.1; LANL 2007, 101894, p. 21). Based on the results of a 1993 geophysical survey, the 1997 RFI concluded this disposal area actually consists of a single, amorphous unit (LANL 1997, 055633, p. 5-2). Excavation activities associated with the 2009 field investigation confirmed a solitary, irregularly shaped disposal trench coincident with the anomalies identified by the 1997 RFI geophysical survey. Materials disposed of in this area include firing-site debris, empty chemical containers, and office waste.

5.18.2 Historical Investigations

A series of geophysical and radiation surveys were conducted over the disposal pit locations in 1993 (LANL 1997, 055633, p. 5-2). Survey results indicated the site may be an amorphous disposal area and not two specific pits. During the 1994 RFI, two separate field activities were initiated to determine if contaminants had migrated from the disposal area. The first of these activities consisted of sampling in the adjacent stream channel and surrounding area. The second activity involved installing vertical monitoring wells upstream and downstream of the disposal area. The data collected during the 1993 field activities guided subsequent RFI activities conducted in 1994. These RFI activities consisted of surface and subsurface sampling from angled and vertical boreholes, trenching and sampling within the disposal area, and installing three monitoring wells in and around SWMU 39-001(a). Angled boreholes established the lateral extent of the disposal area for subsequent test pits and excavation. In 1996, seven test pits were excavated in the area north and northeast of building 39-69 to depths between 12 and 15 ft bgs; samples were collected and the pits were backfilled. No evidence of waste was observed in three of the test pits (LANL 1997, 055633, pp. 5-13 to 5-23). Sampling data indicate inorganic and organic chemicals and radionuclides as potential contaminants.

5.18.3 Sampling Analytical Results and COPC Identification

The locations sampled for SWMU 39-001(a) are shown in Figure 5.18-1. Table 5.18-1 summarizes samples collected and analytical requests for each sample.

Inorganic Chemicals

Table 5.18-2 lists the inorganic chemicals detected above BV or having detection limits above BV. Detected concentrations of inorganic chemicals above BVs are shown in Figure 5.18-2.

The identification of inorganic COPCs is presented in Appendix B, section B-2.16.1. The inorganic chemicals identified as COPCs at SWMU 39-001(a) are antimony, cadmium, cyanide, mercury, perchlorate, silver, and uranium.

Organic Chemicals

Table 5.18-3 lists the organic chemicals detected at SWMU 39-001(a). Detected concentrations of organic chemicals are shown in Figure 5.18-3.

The identification of organic COPCs is presented in Appendix B, section B-2.16.2. The organic chemicals identified as COPCs at SWMU 39-001(a) are Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; 4,4'-DDE; 4,4'-DDT; di-n-butylphthalate; di-n-octylphthalate; dibenz(a,h)anthracene; 1,2,3,4,6,7,8-heptaclorodibenzodioxin; 1,2,3,4,6,7,8-heptaclorodibenzofuran; HMX; indeno(1,2,3-cd)pyrene; iodomethane; 4,4'-methoxychlor; methylene chloride; nitroglycerin; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; and RDX.

Radionuclides

Table 5.18-4 lists the radionuclides detected or detected above BV/FV. Activities of radionuclides detected or detected above BVs/FVs are shown in Figure 5.18-4.

The identification of radionuclide COPCs is presented in Appendix B, section B-2.16.3. The radionuclides identified as COPCs at SMWU 39-001(a) are cesium-134, europium-152, tritium, and uranium-238.

5.18.4 Spatial Distribution of COPCs at SWMU 39-001(a)

The COPCs at SWMU 39-001(a) are summarized in Table 5.18-5. The lateral and vertical extent of COPCs at SWMU 39-001(a) are evaluated in Appendix B, section B-2.16.5. The following sections summarize the results of that evaluation.

Inorganic Chemicals

Lateral and vertical extent are defined for all inorganic COPCs except mercury and uranium. Lateral extent of mercury and uranium are defined, but vertical extent is not defined at two locations.

Organic Chemicals

Lateral and vertical extent are defined for all organic COPCs except Aroclor-1242, Aroclor-1254, and Aroclor-1260. The second phase of remediation at this site is being implemented to remove soil contaminated with these COPCs above cleanup levels, and final confirmatory sampling to define extent has not been conducted.

Radionuclides

Lateral and vertical extent are defined for all radionuclide COPCs except uranium-238. The lateral extent of uranium-238 is defined, but vertical extent is not defined at one location.

5.18.5 Summary of Human Health and Ecological Risk Assessment Results

Human health and ecological risk-screening assessments were not conducted for SWMU 39-001(a) because the extent of contamination is not defined, and further excavation of the site is necessary.

5.19 SWMU 39-001(b) Inactive Disposal Area

5.19.1 Site Description and Operational History

SWMU 39-001(b), shown on Plate 1, consists of three trenches that were used to dispose of debris from firing site SWMU 39-008, empty chemical containers, and office waste (LANL 1993, 015316). Pit 1, originally known as Material Disposal Area Y, was constructed in the late 1960s. Pit 2 was originally constructed parallel and next to Pit 1 and was used from 1976 to 1981. Pit 3 was constructed directly south of the other two pits and was used from 1981 to 1989. All three pits were closed and covered over by May 1989.

5.19.2 Historical Investigations

In 1993, data from several geophysical and surface radiation surveys along with data compiled from historical documents were used to estimate the location of the SWMU 39-001(b) disposal trenches (LANL 1997, 055633, p. 1-6). The results of the geophysical survey indicated the disposal area was more amorphous than the three distinct disposal trenches that had been previously reported (LANL 1997, 055633, p. 5-30).

During the 1994 RFI, two field efforts were initiated to determine if contaminants had migrated from the disposal area. The first of these activities consisted of sampling the adjacent stream channel and surrounding area . The second activity involved the installation of vertical monitoring wells both upstream and downstream of SWMU 39-001(b) (LANL 1997, 055633, p. 5-31).

Field activities in 1996 consisted of establishing a grid over the suspected disposal area and sampling down through the contents of the disposal area. Thirteen test pits were excavated within the amorphous waste disposal areas to depths between 12 and 16 ft bgs; samples were collected and the pits were backfilled. No evidence of waste was observed in two test pit locations (LANL 1997, 055633, p. 5-33). Sampling data showed inorganic and organic chemicals and radionuclides as potential contaminants.

5.19.3 Sampling Analytical Results and COPC Identification

The locations sampled for SWMU 39-001(b) are shown in Figure 5.19-1. Table 5.19-1 summarizes samples collected and analytical requests for each sample.

Inorganic Chemicals

Table 5.19-2 lists the inorganic chemicals detected above BV or having detection limits above BV. Detected concentrations of inorganic chemicals above BVs are shown in Figure 5.19-2.

The identification of inorganic COPCs is presented in Appendix B, section B-2.17.1. The inorganic chemicals identified as COPCs at SWMU 39-001(b) are cyanide, lead, mercury, perchlorate, vanadium, and zinc.

Organic Chemicals

Table 5.19-3 lists the organic chemicals detected at SWMU 39-001(a). Detected concentrations of organic chemicals are shown in Figure 5.19-3.

The identification of organic COPCs is presented in Appendix B, section B-2.17.2. The organic chemicals identified as COPCs at SWMU 39-001(b) are acenaphthene; Aroclor-1254; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; HMX; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; phenanthrene; pyrene; RDX; toluene; and 1,2,4-trimethylbenzene.

Radionuclides

Table 5.19-4 lists the radionuclides detected or detected above BV/FV. Activities of radionuclides detected or detected above BVs/FVs are shown in Figure 5.19-4.

The identification of radionuclide COPCs is presented in Appendix B, section B-2.17.3. The only radionuclide identified as a COPC at SMWU 39-001(b) is tritium.

5.19.4 Spatial Distribution of COPCs at SWMU 39-001(b)

The COPCs at SWMU 39-001(b) are summarized in Table 5.19-5. The lateral and vertical extent of COPCs at SWMU 39-001(b) are evaluated in Appendix B, section B-2.17.5. The following sections summarize the results of that evaluation.

5.19.4.1 Inorganic Chemicals

The distribution of inorganic COPCs at SWMU 39-001(b) is shown in Figure 5.19-2; the analytical results are presented in Table 5.19-2. Lateral and vertical extent are defined for all inorganic COPCs.

5.19.4.2 Organic Chemicals

The distribution of organic COPCs at SWMU 39-001(b) is shown in Figure 5.19-3; the analytical results are presented in Table 5.19-3.Lateral and vertical extent are defined for all organic COPCs at SWMU 39-001 (b).

5.19.4.3 Radionuclides

The distribution of radionuclide COPCs at SWMU 39-001(b) is shown in Figure 5.19-4; the analytical results are presented in Table 5.19-4. Lateral and vertical extent are defined for tritium, which was the only radionuclide COPC.

5.19.5 Summary of Human Health and Ecological Risk Assessment Results

The COPCs for SWMU 39-001(b) were evaluated using residential SSLs and SALs. A risk-screening assessment for the industrial scenario was not conducted because all environmental media in the top 0–5 ft had been excavated and replaced with clean fill during the 2009 investigation. The total excess cancer risk of 2×10^{-6} for the residential scenario is below the NMED target level of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.2 is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose of 0.04 mrem/yr for the residential scenario is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). An ecological risk-screening assessment was not conducted because all environmental media in the top 0–5 ft were excavated and replaced with clean fill so there is no exposure to receptors.

5.20 SWMU 39-006(a) Septic System Inactive Components

5.20.1 Site Description and Operational History

SWMU 39-006(a) inactive components, shown on Plate 1, consists of an inactive septic system (structure 39-12) and an inactive chemical seepage pit. The inactive septic system was constructed in 1952 and was connected only to building 39-02, which housed offices, a laboratory, and a shop (LANL 1993, 015316, p. 5-40).

Before it was removed during 2009 field activities, the septic system consisted of an 1800-gal. septic tank reinforced with concrete (structure 39-12), associated drainlines, and an inactive subsurface sand filter constructed to dispose of photographic processing chemicals. The tank was connected to the now inactive sand filter by approximately 260 ft of VCP, which discharged to an outfall in Ancho Canyon. The sand filter is next to the east side of the ephemeral stream channel in an open area south of the new (active) septic tank (structure 39-104) (LANL 2007, 098281).

Photographic-processing chemicals were routinely disposed of in the septic system at a rate of approximately 65 gal./yr, eventually causing the system to malfunction. To correct the problem, a separate seepage pit was put into use in 1973 for the photographic-processing chemicals and handled approximately 75 gal./yr until 1992 (LANL 2007, 098281). The chemical seepage pit consisted of an open pit approximately 12 ft deep and filled with cobble. A corrugated pipe approximately 1 ft in diameter ran vertically through the center of the seepage pit.

Also in 1973, septic tank 39-12 was enlarged, a new subsurface sand filter was installed on the south side of NM 4, and use of the old sand filter was discontinued. By 1978, the new sand filter became clogged and was replaced. In 1985, use of septic tank 39-12 was discontinued. Waste was removed from the tank, and the tank was filled with sand. A new 2500-gal. precast concrete septic tank (structure 39 104) and drainline were installed, with the new drainline running through the original tank (structure 39-12). The sand filter south of NM 4 was also redesigned and replaced, the second sand filter replacement in 12 yr. New piping was added and tied into the existing 4-in. line under the highway to avoid tearing up the road. In about 1989, the outfall from the new sand filter was plugged, eliminating discharge into the canyon (LANL 1995, 046190, pp. 4-41 to 4-45).

5.20.2 Historical Investigations

During the 1993 RFI, each of the components of this SWMU was sampled (LANL 1995, 046190, pp. 4-41 to 4-66). The inactive sand filter was sampled at three locations at three depths (0–0.5, 4, and 6 ft) along the center line of the sand filter, and a total of nine samples were collected.

The inactive septic tank was underneath building 39-100, and the active sewer line to septic tank 39-104 runs through the inactive tank, which prevented sampling of the tank contents. Four surface samples were collected from four locations, and one borehole was drilled and two additional samples collected from 9 to 11 ft (LANL 2007, 098281).

The outfall was sampled at two locations in the drainage channel: 6 and 15 ft south of the discharge point. Outfall samples were collected from both the surface soil and from 4 ft bgs in the drainage channel (LANL 2007, 098281).

Sampling at the chemical seepage pit was conducted using a combination of surface and borehole sampling. Surface samples were collected from three locations, approximately 10 ft south, east, and north of the discharge pipe in the center of the seepage pit. Boreholes were drilled at these three locations, and subsurface samples were collected from depths of 3, 6, 9, and 12 ft bgs (LANL 1995, 046190, p. 4-67).

In October 1995, a borehole was advanced through the center of the culvert pipe in the chemical seepage pit (ICF Kaiser Engineers 1995, 062968). Two samples were collected from two depth intervals (11.29–12.83 and 12.83–15.33 ft bgs) beneath the concrete plug at the bottom of the seepage pit at location 39-01474. A borehole was advanced next to inactive septic tank 39-02, and samples were collected to determine if a release from the septic tank had occurred (EPA 1995, 052268; LANL 1996, 054333).

The only data presented in this report are from the two samples collected beneath the chemical seepage pit in 1995 and the sample collected next to the inactive septic tank in 1996 because the remaining data are considered screening level. Data from the samples collected beneath the chemical seepage pit show detections of antimony, mercury, and thallium; however, the detection limits were greater than the maximum background concentration. Cadmium was also detected above the BV but below the maximum soil background concentration. Silver was detected above the maximum background concentration, but its concentrations decreased with depth. Benzene and phenol were detected at low levels in the sample collected next to the septic tank at 8–9 ft bgs.

5.20.3 Field Screening for Metals, PCBs, TNT, and RDX

At the inactive components of SWMU 39-006(a), only samples from the sand filter were field screened for metals, PCBs, TNT, and RDX. One location (39-604891) had detections of PCBs at a concentration of 1.8 ppm. No locations had detections of TNT. Four locations had detections of RDX (locations 39-604871, 39-604872, 39-604873, and 39-604874). The detected concentrations of RDX ranged from 1.1 ppm to 6.3 ppm. All samples with detected concentrations of PCBs or RDX were submitted for off-site analysis. The XRF data were reviewed, and samples with high detections of silver, uranium, cesium, and barium were also submitted for off-site analysis to ensure that a minimum of 30% of samples were analyzed off-site.

5.20.4 Sampling Analytical Results and COPC Identification

The locations sampled for the SWMU 39-006(a) inactive sand filter are shown in Figure 5.20-1. The locations sampled for the SWMU 39-006(a) inactive septic tank and seepage pit are shown in Figure 5.20-2. Table 5.20-1 summarizes samples collected and analytical requests for each sample.

Inorganic Chemicals

Table 5.20-2 lists the inorganic chemicals detected above BV or having detection limits above BV. Detected concentrations of inorganic chemicals above BVs are shown in Figure 5.20-3 (inactive sand filter) and Figure 5.20-4 (inactive septic tank and seepage pit).

The identification of inorganic COPCs is presented in Appendix B, section B-2.18.1. The inorganic chemicals identified as COPCs for the inactive components of SWMU 39-006(a) are cadmium, cyanide, nitrate, perchlorate, and silver.

Organic Chemicals

Table 5.20-3 lists the organic chemicals detected for the inactive components of SWMU 39-006(a). Detected concentrations of organic chemicals are shown in Figure 5.20-5 (inactive sand filter) and Figure 5.20-6 (inactive septic tank and seepage pit).

The identification of organic COPCs is presented in Appendix B, section B-2.18.2. The organic chemicals identified as COPCs for the inactive components of SWMU 39-006(a) are acetone; Aroclor-1254; benzene; bis(2-ethylhexyl)phthalate; di-n-butylphthalate; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; iodomethane; 4-isopropyltoluene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; phenol; toluene; and 1,2,4-trimethylbenzene.

Radionuclides

Table 5.20-4 lists the radionuclides detected or detected above BV/FV. Activities of radionuclides detected or detected above BVs/FVs are shown in Figure 5.20-7 (inactive sand filter) and Figure 5.20-8 (inactive septic tank and seepage pit).

The identification of radionuclide COPCs is presented in Appendix B, section B-2.18.3. The radionuclides identified as COPCs for the inactive components of SMWU 39-006(a) are cesium-137 and tritium.

5.20.5 Spatial Distribution of COPCs at SWMU 39-006(a) Inactive Components

The COPCs at SWMU 39-006(a) inactive components are summarized in Table 5.20-5. The lateral and vertical extent of COPCs at SWMU 39-006(a) inactive components are evaluated in Appendix B, section B-2.18.5. The following sections summarize the results of that evaluation.

5.20.5.1 Inorganic Chemicals

The distribution of inorganic COPCs at SWMU 39-006(a) inactive components is shown in Figures 5.20-3 and 5.20-4; the analytical results are presented in Table 5.20-2. Nitrate was the only inorganic COPC at the inactive chemical seepage pit for which lateral and vertical extent are defined. The lateral extent of cadmium, cyanide, and silver are defined at the seepage pit, but vertical extent is not defined at several locations. The lateral and vertical extent of all inorganic COPCs, except cyanide, are defined at the inactive septic tank. The lateral extent of cyanide is defined, but vertical extent is not defined at one location. Nitrate was the only inorganic COPC at the inactive sand filter for which lateral and vertical extent are defined. The lateral and vertical extent of silver and cyanide are not defined at the sand filter. The lateral extent of perchlorate is defined at the sand filter, but vertical extent is not defined at one location.

5.20.5.2 Organic Chemicals

The distribution of organic COPCs at SWMU 39-006(a) is shown in Figures 5.20-5 and 5.20-6; the analytical results are presented in Table 5.20-3. The lateral and vertical extent of all organic COPCs except bis(2-ethylhexyl)phthalate is defined at the inactive chemical seepage pit. The vertical extent of bis(2-ethylhexyl)phthalate is defined at the seepage pit, but lateral extent is not defined. The lateral and vertical extent of all organic COPCs, except Aroclor-1254, are defined at the inactive septic tank. The lateral extent of Aroclor-1254 is defined at the septic tank, but vertical extent is not defined at one location. The lateral and vertical extent of all organic COPCs, except Aroclor-1254, are defined at the inactive sand filter. Neither lateral nor vertical extent of Aroclor-1254 are defined at the sand filter.

5.20.5.3 Radionuclides

The distribution of radionuclide COPCs at SWMU 39-006(a) inactive components is shown in Figures 5.20-7 and 5.20-8; the analytical results are presented in Table 5.20-4. Tritium was the only radionuclide COPC at the inactive chemical seepage pit and inactive septic tank. Lateral and vertical extent are defined for tritium at the seepage pit but not at the septic tank. The vertical extent of tritium is defined at the septic tank, but not the lateral extent. Cesium-137 and tritium are the radionuclide COPCs at the inactive sand filter. Lateral and vertical extent are defined for cesium-137 but not for tritium. Neither lateral nor vertical extent are defined for tritium.

5.20.6 Summary of Human Health and Ecological Risk Assessment Results

COPCs for SWMU 39-006(a) inactive components were evaluated using residential SSLs and SALs. A risk-screening assessment for the industrial scenario was not conducted because postexcavation samples were collected from below 0–1 ft bgs. The total excess cancer risk of 2×10^{-7} for the residential scenario is below NMED target level of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.3 is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose of 0.87 mrem/yr for the residential scenario is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The ecological risk-screening assessment determined there are no ecological risks to receptors.

5.21 AOCs 39-002(d) and 39-002(e)

5.21.1 Site Description and Operational History

AOC 39-002(d) is a former hazardous waste SAA located on a gravel pad on the outside, southwest corner of a blockhouse (structure 39-57) for a firing site [SWMU 39-004(d)]. The SAA consisted of a 5-ft × 5-ft × 4-ft electrical closet placed on an unpaved gravel pad. From the late 1980s to the 1990s, this SAA was used to store photographic wastes, cloth, and paper contaminated with various substances (acetone, ethanol, transformer oil, trichloroethane, vacuum grease, and copper sulfate) (LANL 1993, 015316, p. 5-18). This SAA was removed from service and administratively closed, and the area is no longer used for storage.

AOC 39-002(e) is a former hazardous waste SAA located at the south end of the gas-gun facility (building 39-69) on a concrete pad under a breezeway that connects building 39-69 to building 39-89, a gas-gun support facility. Waste materials from gas-gun experiments, including aluminum, lead, carbon dust, ethanol, brass, paraffin, stainless steel, quartz, nylon, WD-40, Gunk, Polaroid film, and Fantastik cleaner, were stored in this location (LANL 1993, 015316, p. 5-18). This SAA was removed from service and administratively closed, and this area ceased to be used for storage.

Neither of these AOCs were used for storage before or after they became SAAs. These sites were operated only as SAAs and regulated as hazardous waste SAAs throughout their life cycle. Because both of these AOCs met the regulatory requirements for SAAs, no investigation was proposed in the approved investigation work plan (LANL 2007, 101894). Additionally, the approved investigation work plan specified that a statement of basis describing the rationale for no NFA would be included in the investigation report and requests would be made for certificates of completion. The statement of basis for AOCs 39-002(d) and 39-002(e) is provided in the following section.

5.21.2 Regulatory Basis for NFA

An SAA is a designated accumulation area for hazardous or mixed waste at or near any point of generation and under the control of the operator of the process generating the waste. An SAA

- must be prominently posted as a hazardous waste SAA,
- must be labeled hazardous waste or with the major constituents,
- must be used only by authorized, trained users,
- must be locked if the area is located outside, and
- must have administrative and physical controls in place.

SAAs are active units regulated under 40 CFR 262, Standards Applicable to Generators of Hazardous Waste and 20.4.1 New Mexico Administrative Code, Hazardous Waste Management Regulations. The

Laboratory conducts training classes for the operation of these areas, inspects these areas, and has institutional controls governing the closure of these units. NMED also performs annual inspections.

No historical releases are known to have occurred at either of these AOCs. Should a release have occurred, it would have been cleaned up immediately in accordance with The Laboratory's Spill Prevention Countermeasures and Control Plan and/or Administrative Requirements. Because any releases are cleaned up immediately, these units do not have the potential to become historical release sites. Therefore, these areas are regulated under 3004(a) of RCRA, and not 3004(u) of the Hazardous and Solid Waste Amendments.

Under the Hazardous and Solid Waste Amendments (HSWA) module of the Laboratory's Hazardous Waste Facility Permit (Module VIII), SAAs were recommended for NFA under NFA Criterion 4, which states, "The site is regulated under another state and/or federal authority. If the site is known or suspected of releasing RCRA solid or hazardous wastes and/or constituents to the environment, it has been or will be investigated and/or remediated in accordance with the applicable state and/or federal requirements." This basis for approving SAAs for NFA was established by the Laboratory, DOE, EPA, and NMED. A July 13, 1992, DOE letter documents an understanding agreed to by EPA Region 6 and representatives of the DOE Los Alamos Area Office and the Laboratory (DOE 1992, 021104.3). All parties agreed that active hazardous waste accumulation areas such as SAAs and less-than-90-day storage areas should not be regulated under HSWA because they are regulated under the authority of 40 CFR, Part 262 by NMED. This joint decision was made to avoid dual regulation of these units. This letter was sent to NMED.

NMED set precedence in approving SAAs and less-than-90-day accumulation areas for NFA in a December 23, 1998, approval of a Class III Permit Modification request that approved removing 99 SWMUs from Module VIII of the Laboratory's Hazardous Waste Facility Permit (NMED 1998, 063042). Fifteen of the 99 SWMUs were SAAs or less-than-90-day accumulation areas. This basis for NFA under Module VIII is also applicable for recommending corrective action complete under the Consent Order.

6.0 CONCLUSIONS

6.1 Summary of Remediation Activities

At SWMU 39-006(a) inactive components and SWMU 39-001(b), the maximum detected concentrations were below both industrial and residential screening values.

At SWMU 39-001(a), the remediation activities in the work plan were completed, and confirmation sampling demonstrated that cleanup levels were exceeded for Arochlor-1242. Therefore, a second phase of remediation was implemented and is being completed, requiring submittal of an addendum at a future date.

6.2 Summary of Nature and Extent for COPCs

The status of nature and extent determinations is summarized in Table 6.2-1. Nature and extent are defined at SWMUs 39-001(b), 39-005, and 39-007(a), 39-002(a) Area 3, and 39-006(a) active components and AOCs 39-002(c), 39-002(f), and 39-007(d). Nature and extent are not defined at SWMUs 39-001(a), 39-010, 39-002(a) Areas 1 and 2, and 39-006(a) inactive components and AOC 39-002(b). Nature and extent are not defined for three active firing sites [SWMUs 39-004(c), 39-004(d), and 39-008], but the results of the preliminary characterization indicated that contaminants are not migrating off-site from these SWMUs.

6.3 Human Health Screening Risk Assessment Results

The human health risk-screening assessments for SWMUs 39-002(a) Area 1 and 39-007(a) indicated potential unacceptable risks for the industrial and residential scenarios. Total excess cancer risks were above the NMED target level of 1×10^{-5} for both scenarios and the HI was above 1.0 for the residential scenario. The elevated risks were primarily from benzo(a)pyrene and dibenz(a,h)anthracene at SWMU 39-002(a) Area 1 and Aroclor-1254 and Aroclor-1260 at SWMU 39-007(a). The total doses for the industrial and residential scenarios were below the DOE target dose of 15 mrem/yr at SWMU 39-002(a) Area 1, while no radionuclide COPCs were identified.

The human health risk-screening assessments indicated no potential unacceptable risks or doses for the industrial and residential scenarios at SWMUs 39-002(a) Area 3, 39-005, 39-006(a) active components, and 39-010 as well as AOCs 39-002(c), 39-002(f), and 39-007(d). Following remediation and sampling, the risks and doses were less than the NMED and DOE target levels for the residential scenario at SWMUs 39-001(b) and 39-006(a) inactive components. The human health risk-screening assessments in the extended drainages indicated no potential unacceptable risks or doses for the recreational and residential scenarios. The total excess cancer risks were less than the NMED target level of 1×10^{-5} and the HIs were less than the NMED target HI of 1.0.

The total doses were below the DOE target dose of 15 mrem/yr at all sites. The equivalent total risks were estimated using EPA's radionuclide preliminary remediation goals for an outdoor worker and a resident (http://epa-orgs.ornl.gov/cgi-bin/radionuclides/rprg_search) and a conversion from RESRAD for the recreational scenario. The radionuclide total risks ranged from 5×10^{-11} to 1×10^{-7} for the industrial scenario, from 2×10^{-8} to 4×10^{-5} for the residential scenario, and was 2×10^{-9} in the extended drainages for the recreational scenario.

The Laboratory's as low as reasonably achievable (ALARA) program description ("Los Alamos National Laboratory Environmental ALARA Program," PD410, pg 7, effective date September 8, 2008) states that "quantitative ALARA evaluations are not necessary for Laboratory activities that have a potential for annual public exposure less than a 3-mrem TEDE individual dose…." For SWMU 39-006(a), which is the only site potentially accessible to the public, the calculated radiation dose for the residential scenario is 0.9 mrem/yr. Therefore, radiation exposure to the public at this site is ALARA.

The majority of sites within TA-39 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 its 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.

6.4 Ecological Screening Risk Assessment Results

No potential ecological risks to any receptor were found based on multiple lines of evidence including minimum ESL comparisons, HI analyses, comparisons to background concentrations, and potential effects to populations (individuals for threatened and endangered species). In addition, field and laboratory studies conducted and reported as part of the ecological investigations in Los Alamos and Pueblo Canyons (LANL 2004, 087390), Mortandad Canyon (LANL 2006, 094161; LANL 2007, 098279), and Pajarito Canyon (LANL 2008, 104909; LANL 2009, 106771) have found that similar concentrations of chemicals of potential ecological concern (COPECs) have not adversely impacted small mammal, bird,

earthworm, and plant populations, and individual Mexican spotted owls. These lines of evidence and the analysis of COPECs without ESLs support the conclusion that no potential ecological risks exist at the sites within the North Ancho Canyon Aggregate Area.

7.0 RECOMMENDATIONS

The determination of site status is based on the results of the risk-screening assessments and the determination of nature and extent of contamination. The residential scenario is the only scenario for which corrective action complete without controls is applicable; that is, no additional corrective action or controls are necessary. Based on information and data presented in this investigation report, remediation and characterization activities are recommended as complete at five sites. Preliminary characterization of the four active sites is also recommended as complete. Additional characterization or remediation is recommended for five sites. The recommendations are summarized in Table 6.2-1.

7.1 Sites Recommended for Corrective Action Complete without Controls

The nature and extent of contamination are defined at the following North Ancho Canyon Aggregate Area sites discussed in this investigation report:

- SWMU 39-001(b)
- SWMU 39-005
- AOC 39-002(c)
- AOC 39-002(f)
- AOC 39-007(d)

Furthermore, these sites do not pose potential unacceptable risks or doses to human health under the residential scenario and, as such, no further remediation or investigation is required. The ecological risk-screening assessments also determined that none of the sites pose potential risks to ecological receptors.

The Laboratory is requesting certificates of completion (corrective action complete without controls) for the above sites. In addition, AOCs 39-002(d) and 39-002(e) are recommended for corrective action complete without controls because they were used only as SAAs regulated under RCRA and were operated and closed in accordance with applicable regulations. Because these sites do not pose a potential unacceptable risk and dose to human health under a residential scenario and no potential risk to the environment, neither site controls nor future actions are necessary.

Nature and extent of contamination are defined at SWMU 39-002(a) Area 3, and this site also poses no unacceptable human health or ecological risk. This site is not recommended for corrective action complete, however, because additional corrective actions are required for the remainder of the SWMU (Areas 1 and 2). Additional sampling in the extended drainages is also not recommended.

7.2 Sites Recommended for Additional Characterization or Remediation

Based on the results of the North Ancho Canyon Aggregate Area investigation, five sites are recommended for additional characterization or remediation. SWMU 39-007(a) exceeds the NMED target of 1×10^{-5} for the industrial and residential scenarios from Aroclor-1254 and Aroclor-1260 at a single location. SWMU 39-002(a) Area 1 exceeds the NMED target of 1×10^{-5} for the industrial and residential

scenarios from benzo(a)pyrene (and dibenz[a,h]anthracene for residential) across the site. In addition, the extent of COPCs is not defined for this site. Therefore, it is recommended SWMU 39-007(a) undergo remediation, and SWMU 39-002(a) Area 1 undergo further investigation and remediation.

The extent of contamination is not defined at SMWU 39-006(a) inactive components for cadmium, cyanide, perchlorate, silver, Aroclor-1254, bis(2-ethylhexyl)phthalate, and tritium. The extent of contamination is also not defined at SWMU 39-010 for copper, mercury, lead, benzo(a)pyrene, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, HMX, uranium-234, uranium-235/236, and uranium-238. Additional sampling is recommended at these sites to define extent. AOC 39-002(b) could not be sampled as originally proposed in the investigation work plan. Development and implementation of an alternate sampling approach is recommended.

Because preliminary investigation results demonstrated that current activities are not contributing to off-site migration, it is recommended that further investigation of active sites [SWMUs 39-004(c), 39-004(d), the active components of 39-006(a), and 39-008] be delayed until operations at these sites cease. It is also recommended that characterization of SWMU 39-002(a) Area 2, an indoor storage area, be delayed until operations cease.

A second phase of remediation is continuing at SWMU 39-001(a). Upon completion of confirmatory sampling, an addendum to this investigation report describing the results of the additional remediation and presenting a recommendation for final disposition of this site will be submitted to NMED.

8.0 REFERENCES AND MAP DATA SOURCES

8.1 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 New Mexico Environment Department Hazardous Waste Bureau and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

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8.2 Map Data Sources

Legend Item	Data Source
2-ft elevation contour	Hypsography, 2 Foot Contour Interval; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.
10-ft elevation contour	Hypsography, 10-ft Contour Interval; LANL, ENV Environmental Remediation and Surveillance Program; 1991. Hypsography, 20-ft Contour Interval; LANL, ENV Environmental Remediation and Surveillance Program; 1991.
100-ft elevation contour	Hypsography, 100-ft Contour Interval; LANL, ENV Environmental Remediation and Surveillance Program; 1991.
North Ancho Canyon Aggregate Area	Aggregate Areas; LANL, ENV Environmental Remediation & Surveillance Program, ER2005-0496; 1:2,500 Scale Data; 22 September 2005.
Laboratory boundary	LANL Areas Used and Occupied; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; 19 September 2007; as published 04 December 2008.
Technical Area boundary	Technical Area Boundaries; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; September 2007; as published 04 December 2008.
Primary paved road Secondary paved road	Road Centerlines for the County of Los Alamos; County of Los Alamos, Information Services; as published 04 March 2009.
Surface water and stormwater runoff monitoring station	Point Feature Locations of the Environmental Restoration Project Database; Los Alamos National Laboratory, Waste and Environmental Services Division, EP2009-0283; 04 June 2009.
Monitoring well	Point Feature Locations of the Environmental Restoration Project Database; Los Alamos National Laboratory, Waste and Environmental Services Division, EP2009-0283; 04 June 2009.
Sampling location with detected results	Point Feature Locations of the Environmental Restoration Project Database; Los Alamos National Laboratory, Waste and Environmental Services Division, EP2009-0283; 04 June 2009.
Communication line	Communication Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 08 August 2002; as published 28 May 2009.
Electric line	Primary Electric Grid; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Legend Item	Data Source
Gas line	Primary Gas Distribution Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
Sewer line	Sewer Line System; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
Water line	Water Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
Paved road	Paved Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
Unpaved road	Dirt Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
Fence	Security and Industrial Fences and Gates; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
Structure	Structures; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.
SWMU or AOC SWMU or AOC (NFA) Subject SWMU or AOC Other SWMU or AOC	Potential Release Sites; Los Alamos National Laboratory, Waste and Environmental Services Division, Environmental Data and Analysis Group, EP2009-0137; 1:2,500 Scale Data; 13 March 2009.
Drainage	Modeled Surface Drainage, 1991; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program, ER2002-0591; 1:24,000 Scale Data; Unknown publication date.
Excavation boundary SWMU 39-001(b) excavation boundary SWMU 39-006(a) Inactive, Seepage Pit and Septic Tank excavation boundary SWMU 39-006(a) Inactive, Seepage Pit and Septic Tank excavation boundary	Geodetic survey (Green 2009, 106947)
Exploratory trench	Geodetic survey (Green 2009, 106947)
1997 RFI test pit	Point Feature Locations of the Environmental Restoration Project Database; Los Alamos National Laboratory, Waste and Environmental Services Division, EP2009-0283; 04 June 2009.
Historical sampling transect	LANL (Los Alamos National Laboratory), December 2007. “Investigation Work Plan for North Ancho Canyon Aggregate Area, Revision 1,” Los Alamos National Laboratory document LA-UR-07-8272, Los Alamos, New Mexico.(LANL 2007, 101894)

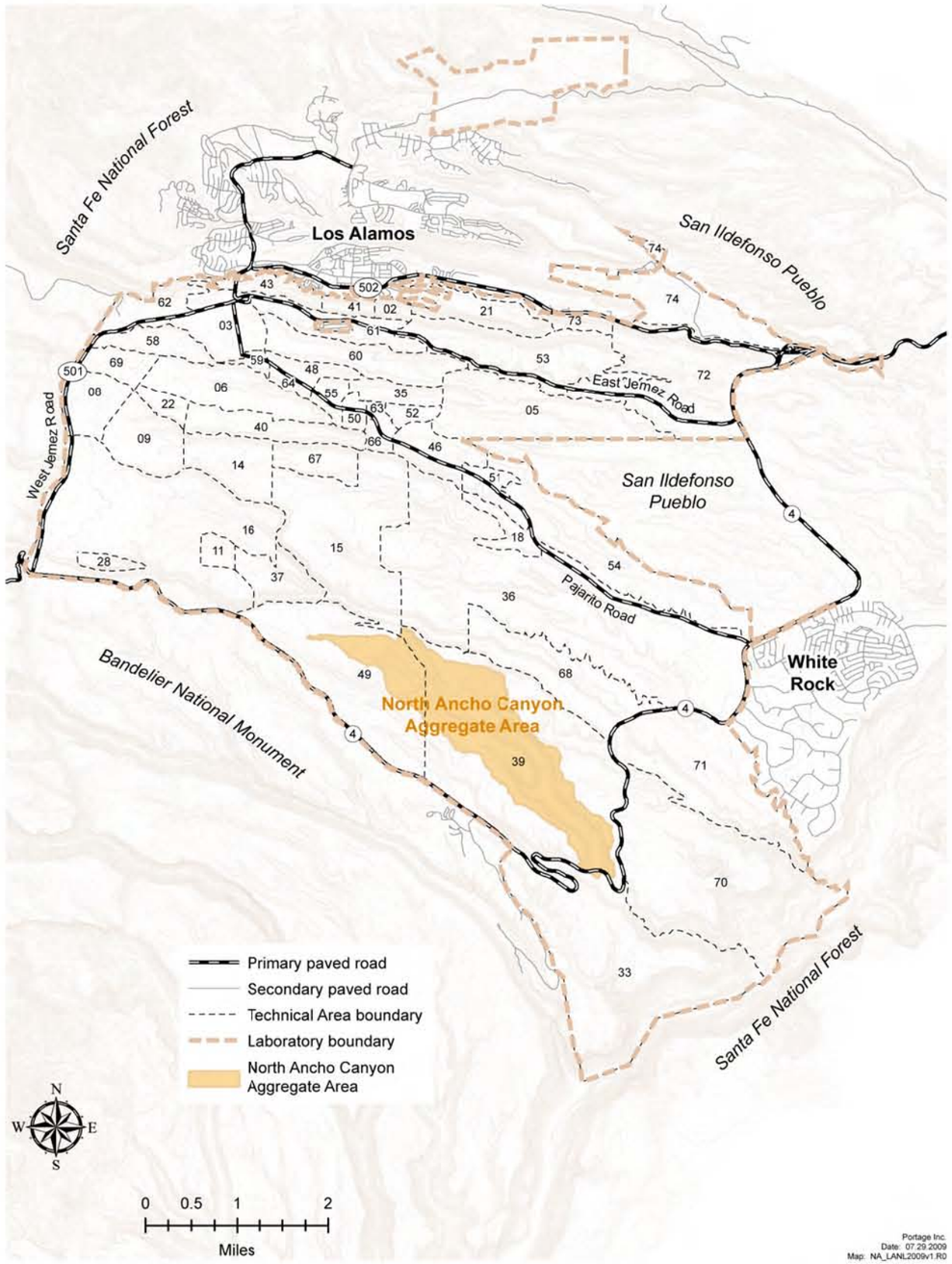

Figure 1.1-1 Location of the North Ancho Canyon Aggregate Area

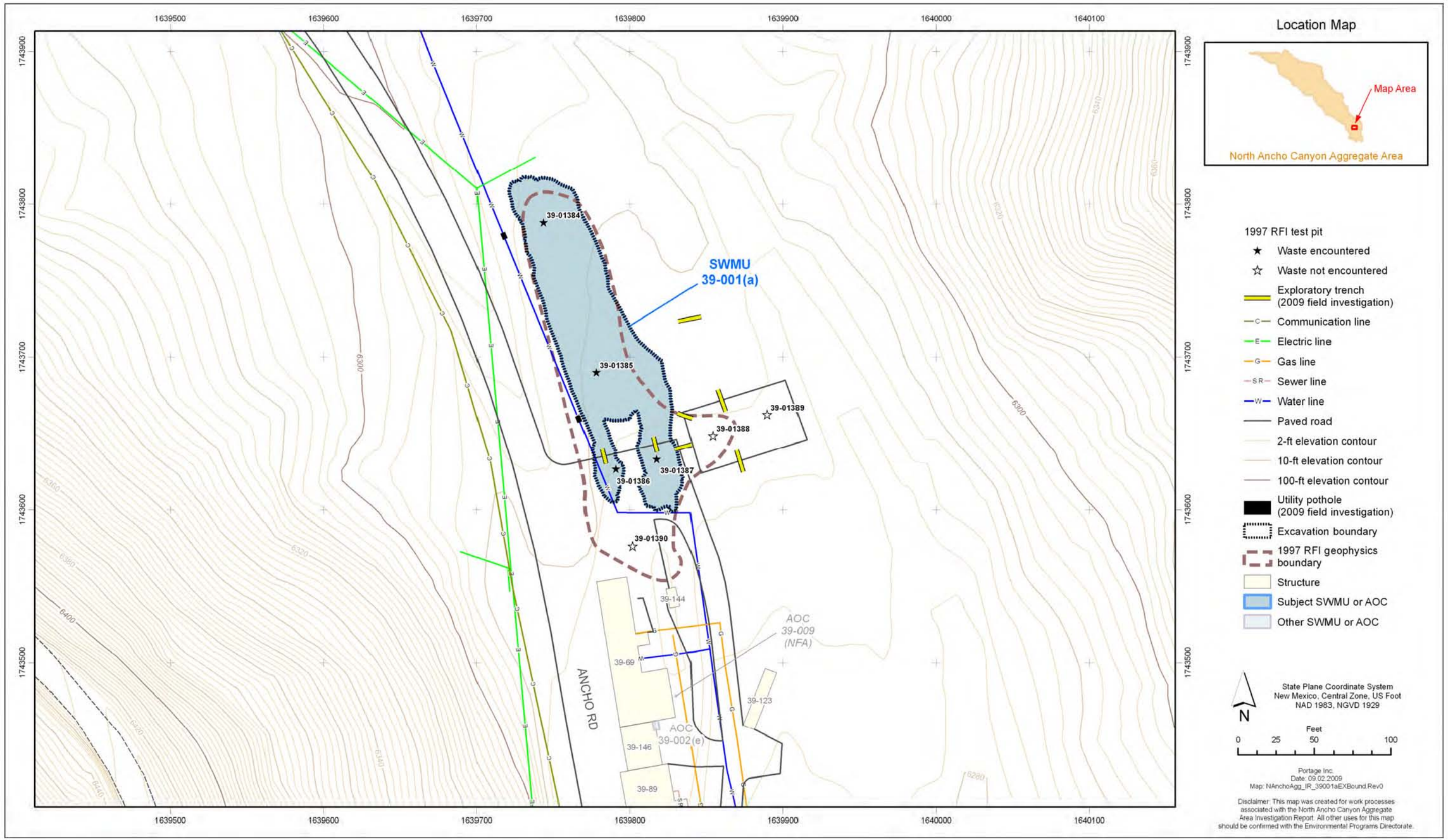

Figure 3.2-1 Final excavation boundary and exploratory trenches at SWMU 39-001(a)

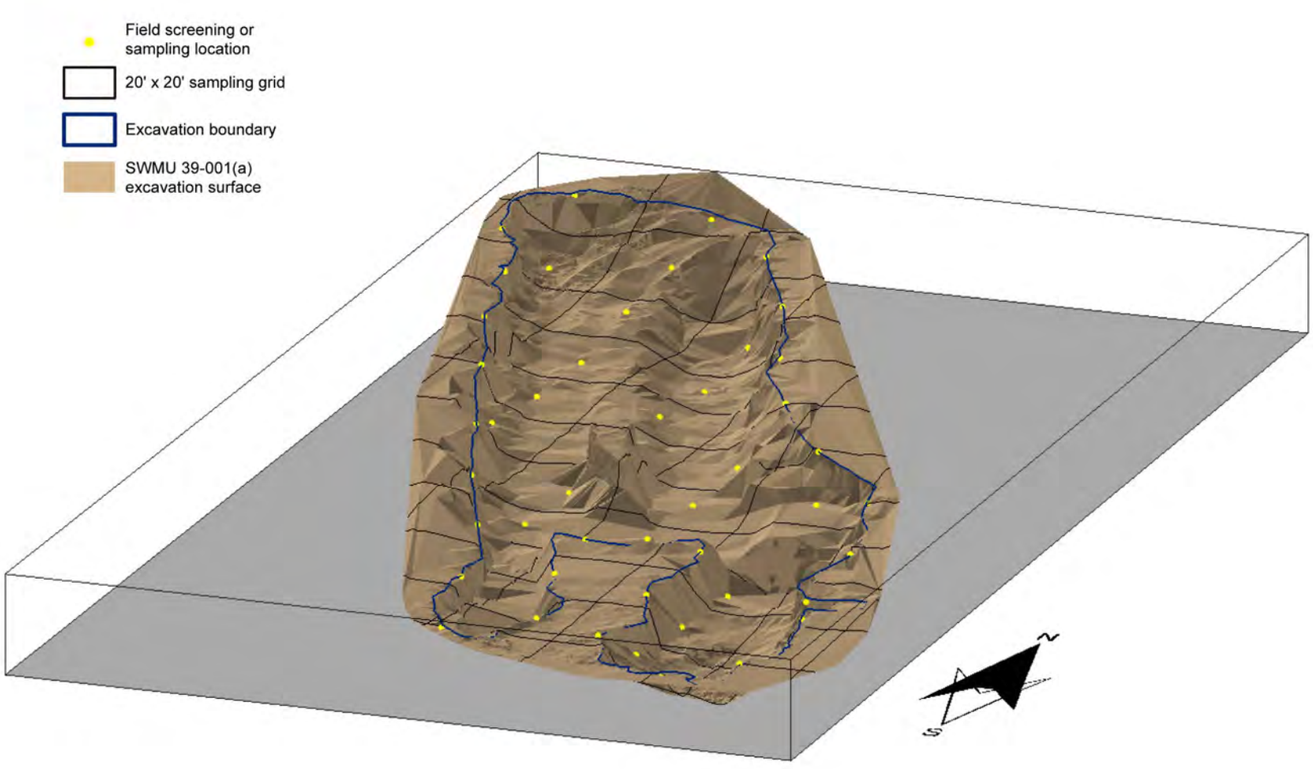

Figure 3.2-2 Rendering of the pit profile at SWMU 39-001(a) after excavation

Figure 3.2-3 Outline of original disposal trenches at SWMU 39-001(b) with an overlay of the final excavation pit

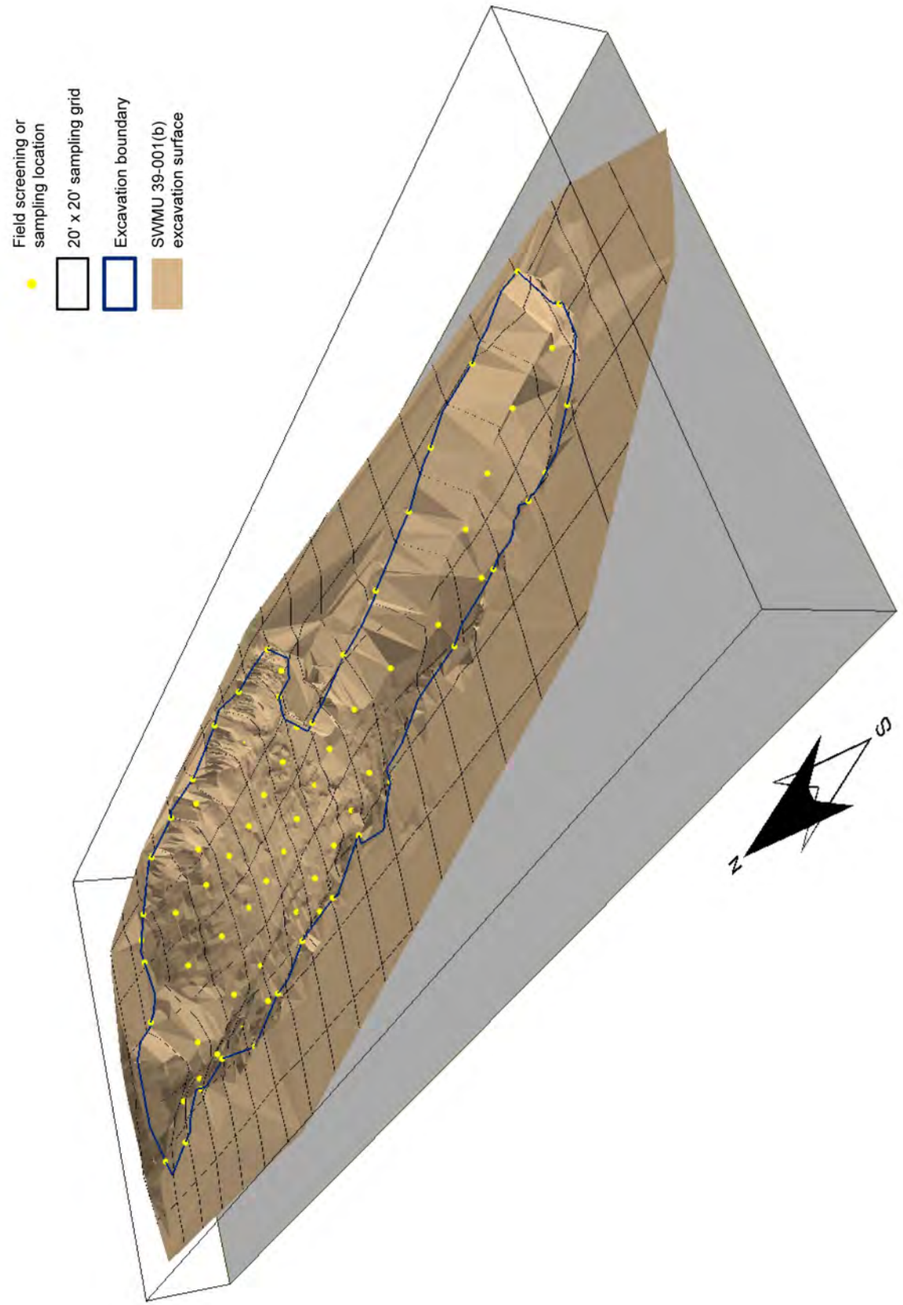

Figure 3.2-4 Rendering of the pit profile at SWMU 39-001(b) after excavation

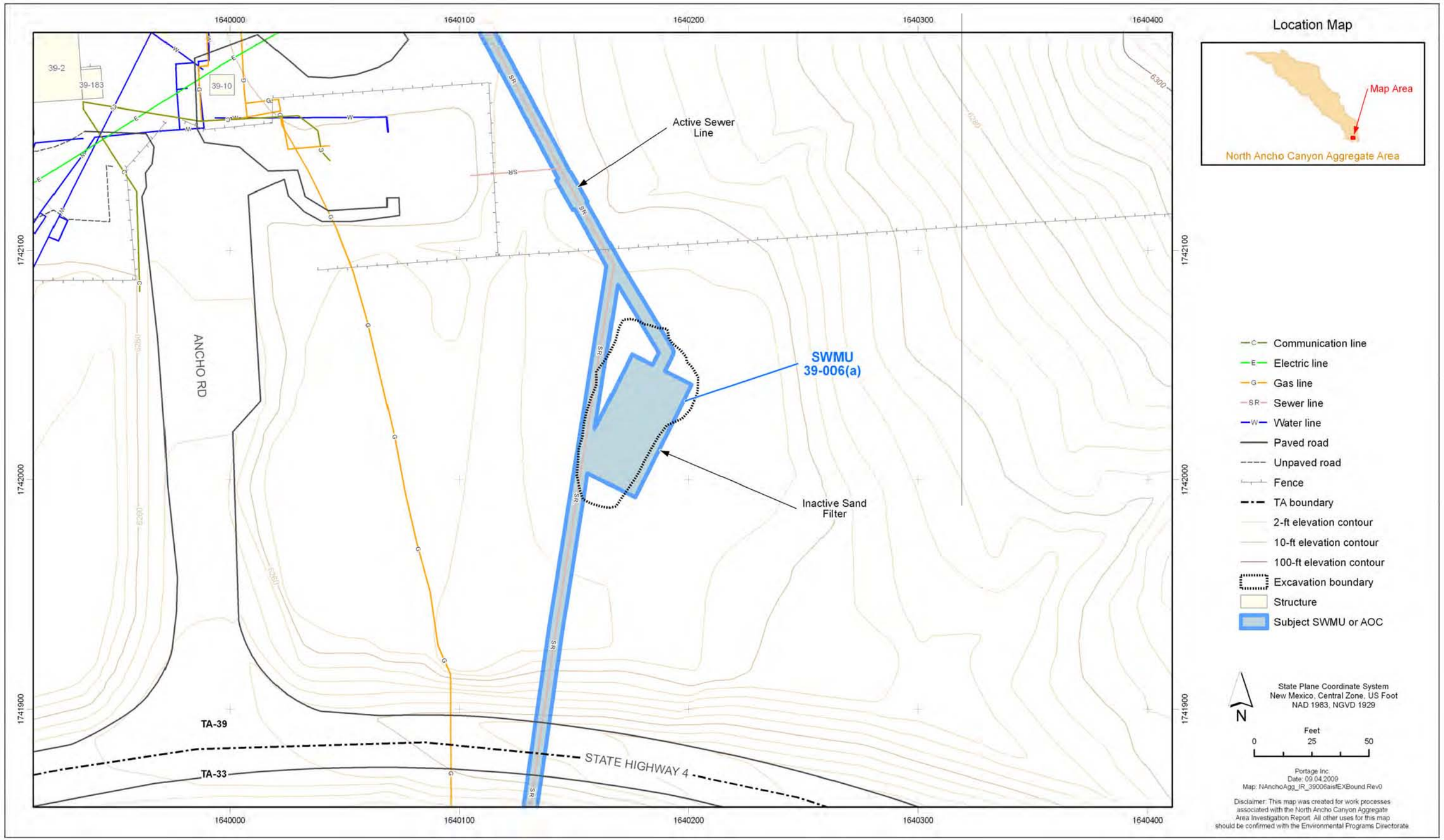

Figure 3.2-5 Outline of the SWMU 39-006(a) inactive sand filter after final excavation

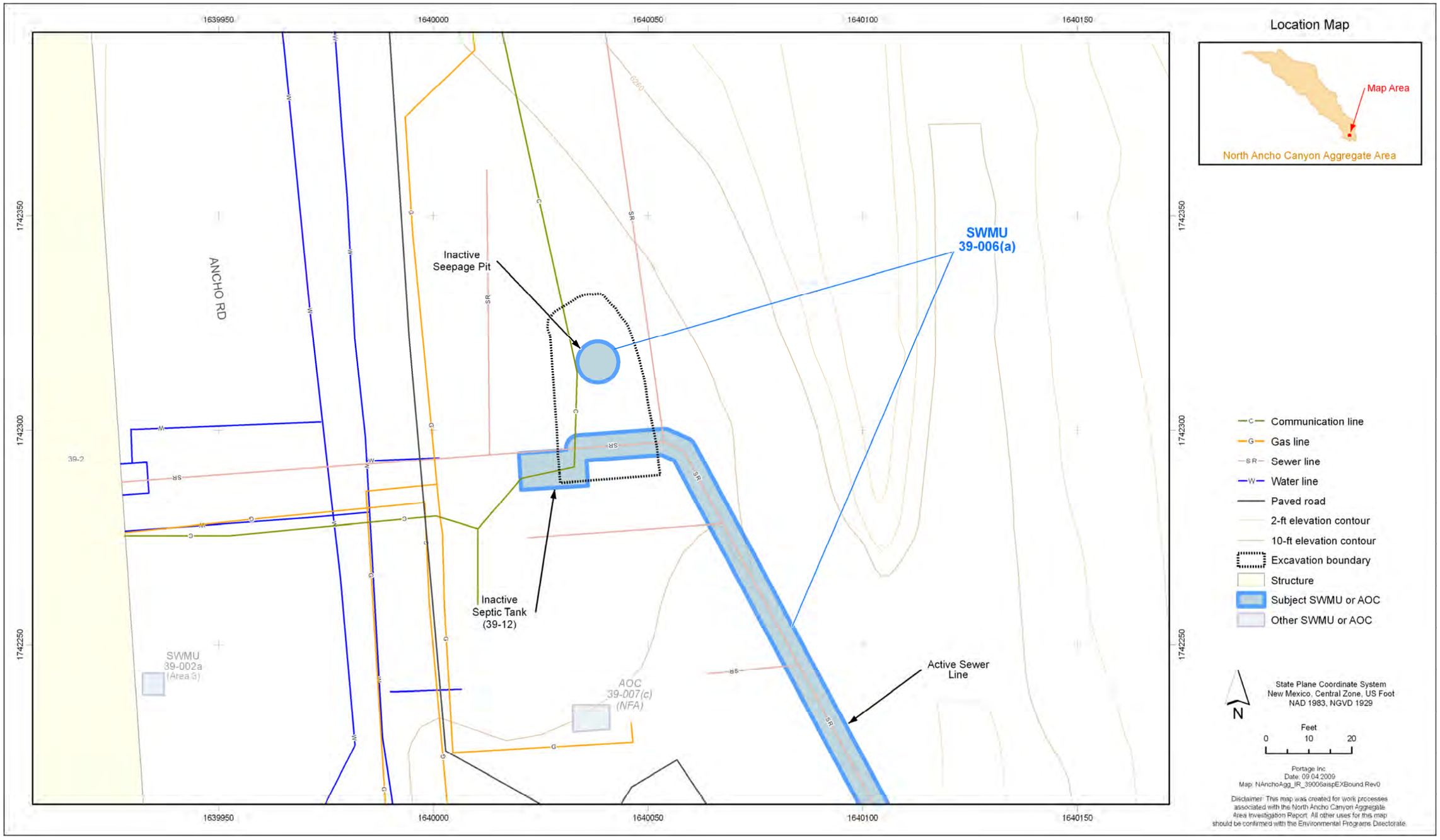

Figure 3.2-6 Final excavation boundaries for the SWMU 39-006(a) seepage pit and septic tank

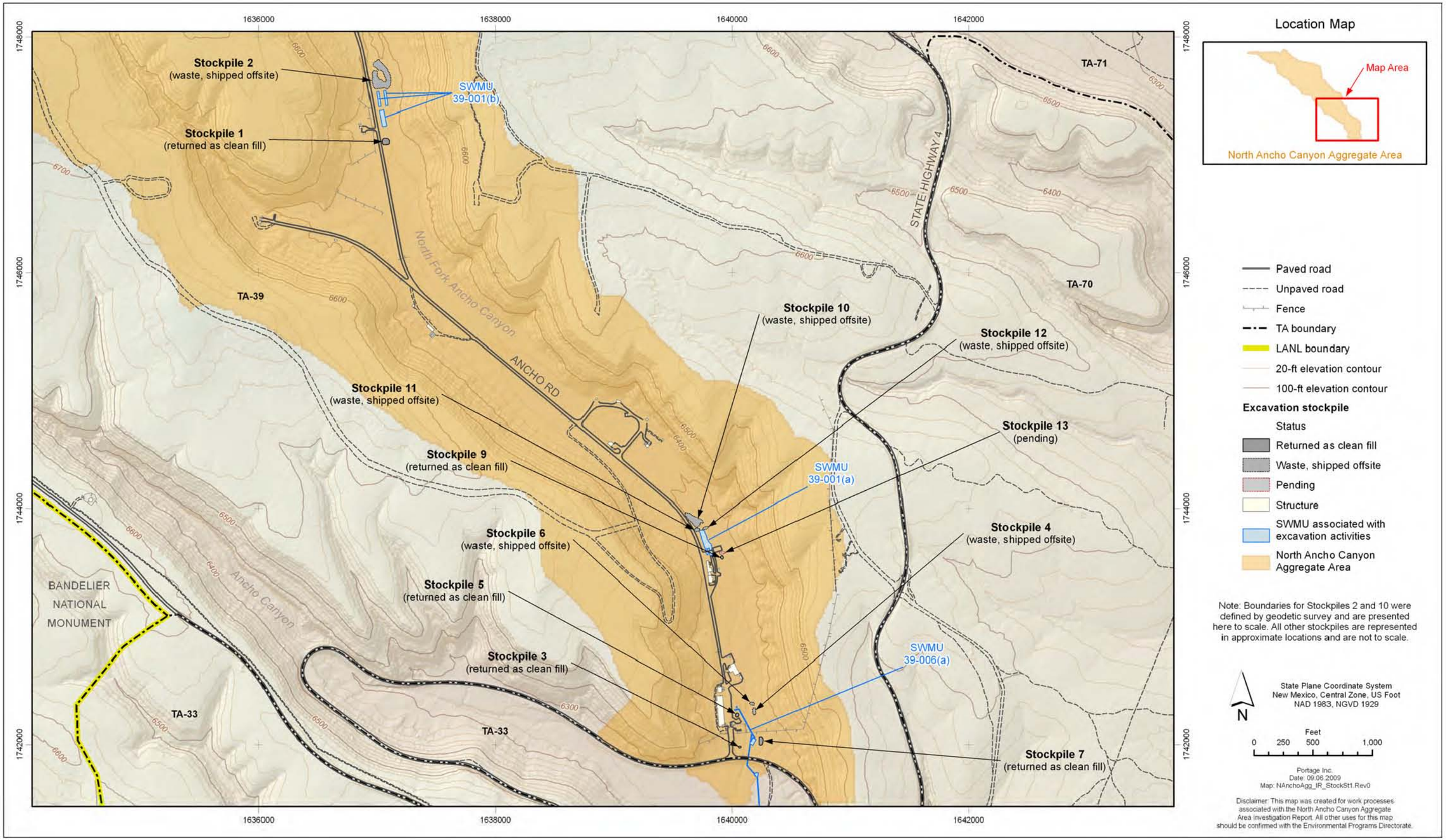

Figure 3.6-1 Locations and status of stockpiles

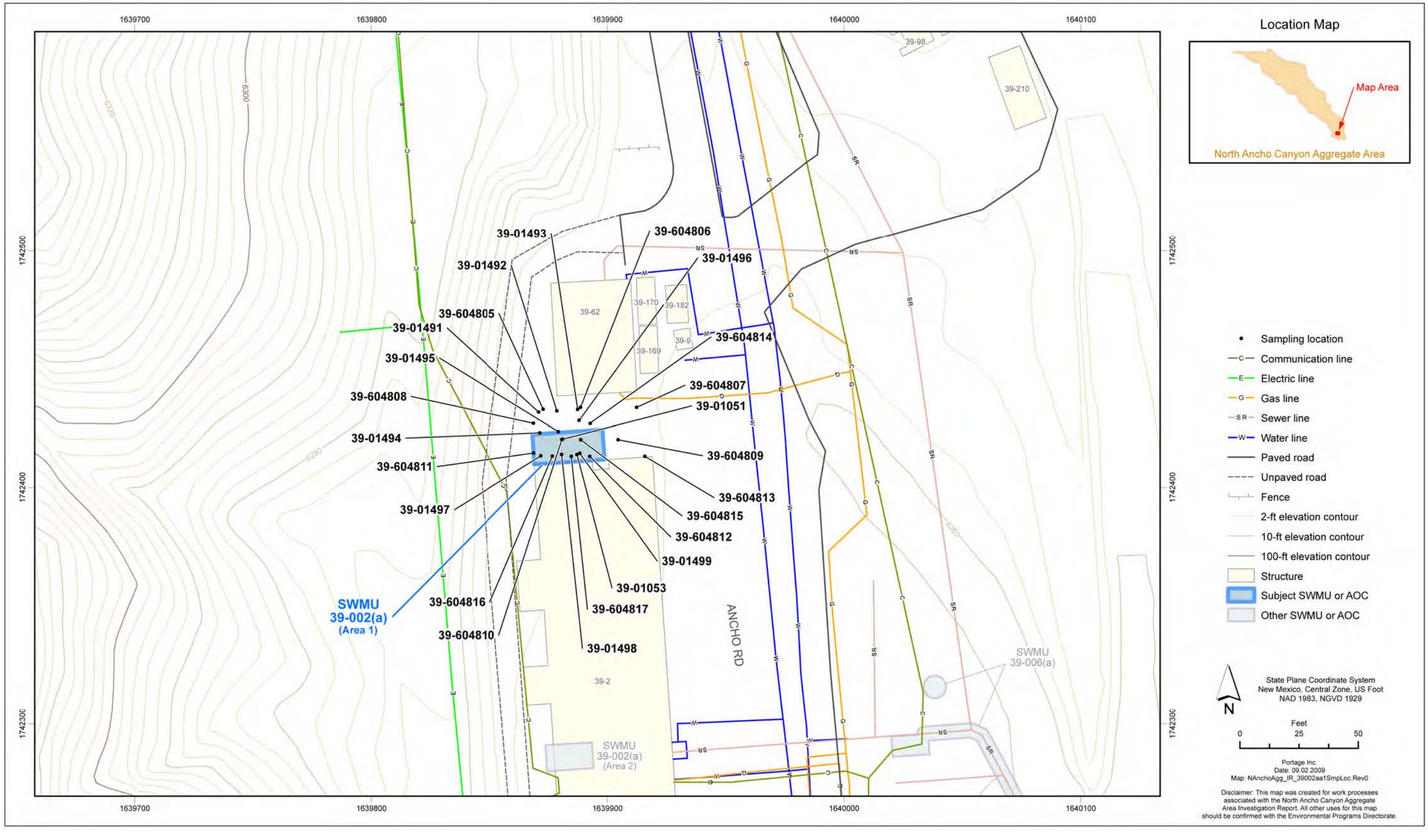

Figure 5.3-1 Locations sampled for SWMU 39-002(a) Area 1

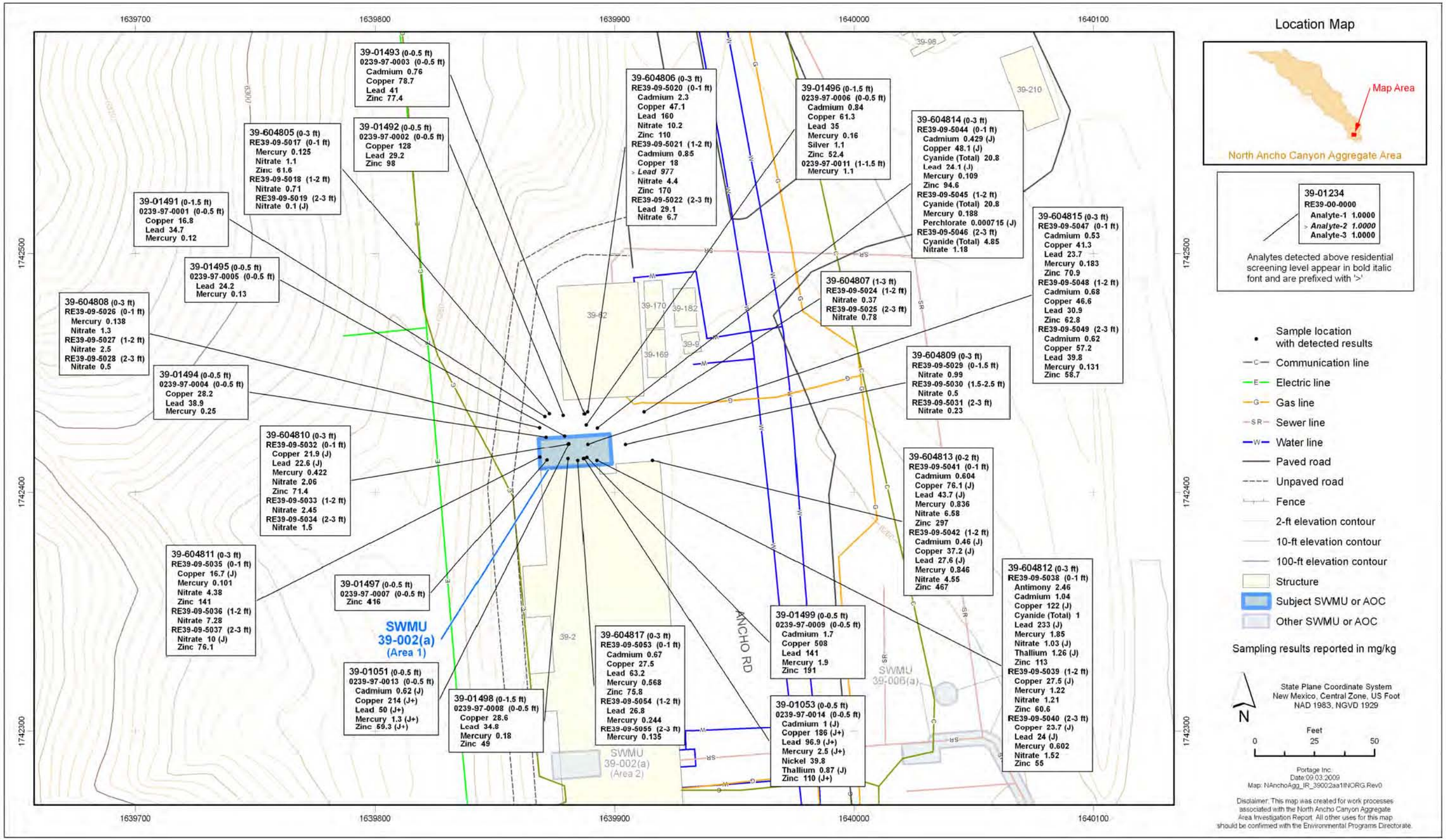

Figure 5.3-2 Inorganic chemicals detected or detected above BVs at 39-002(a) Area 1

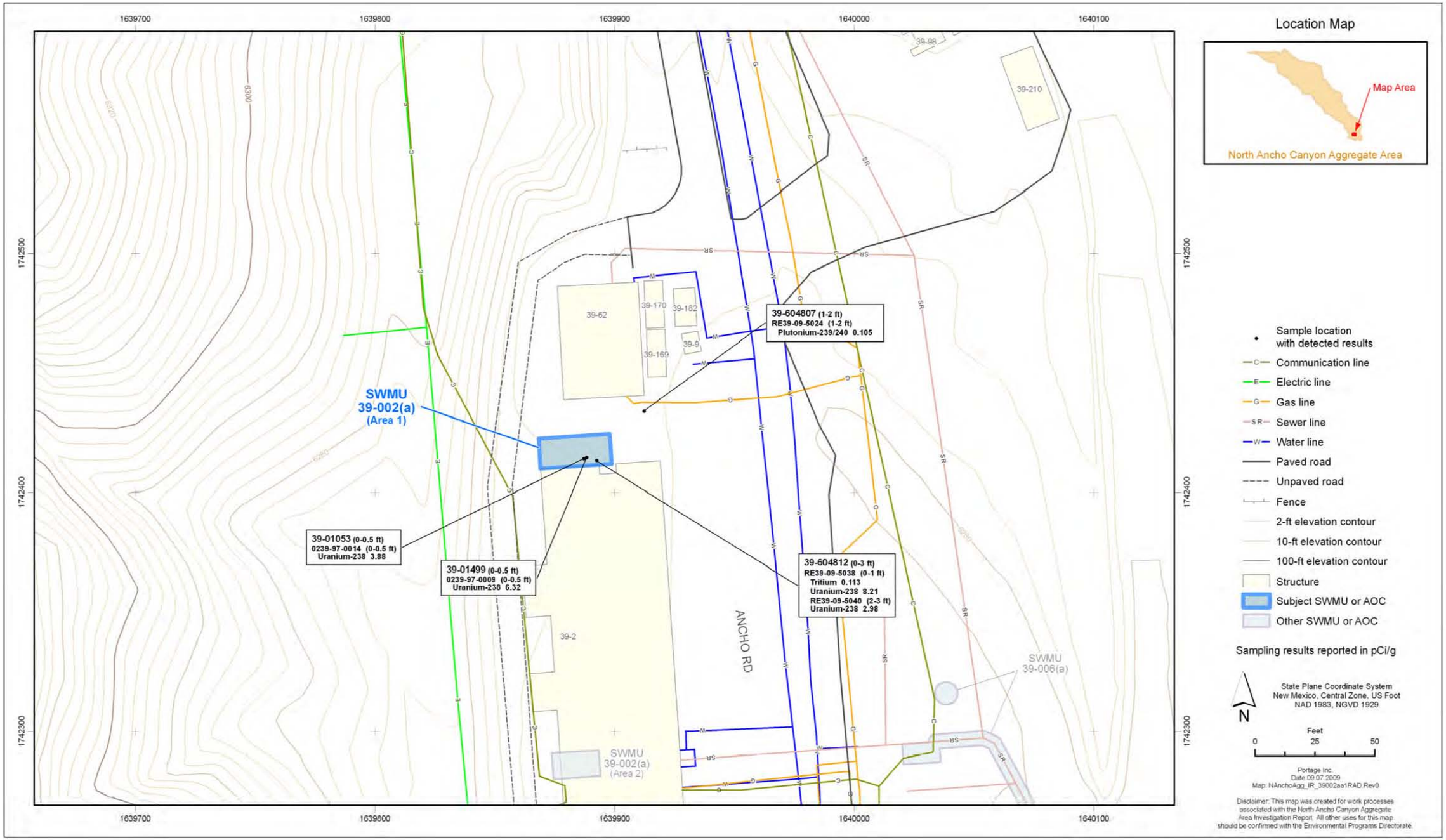

Figure 5.3-3 Radionuclides detected or detected above BVs/FVs at 39-002(a) Area 1

Figure 5.5-1 Locations sampled for SWMU 39-002(a) Area 3

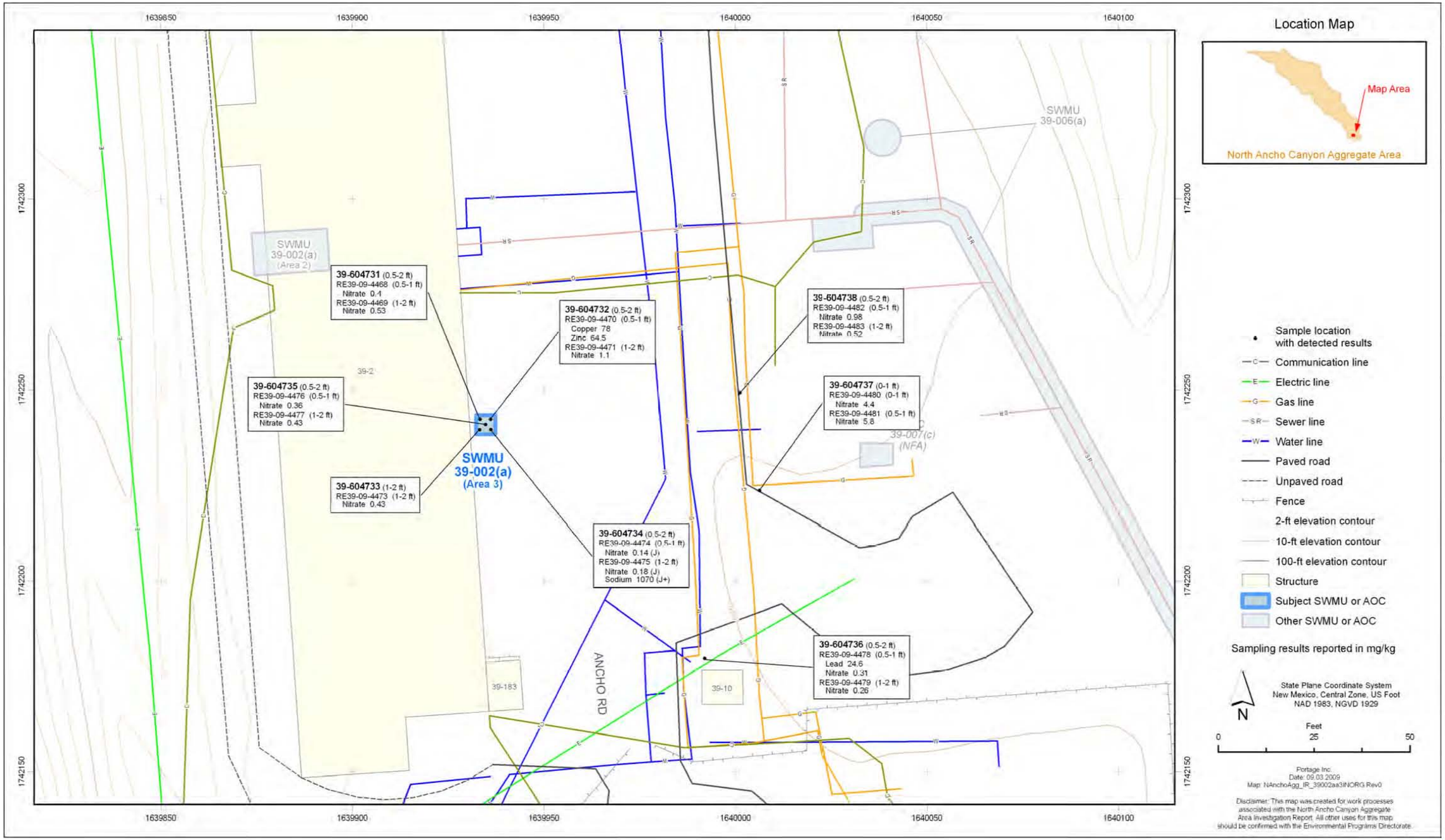

Figure 5.5-2 Inorganic chemicals detected or detected above BVs at SWMU 39-002(a) Area 3

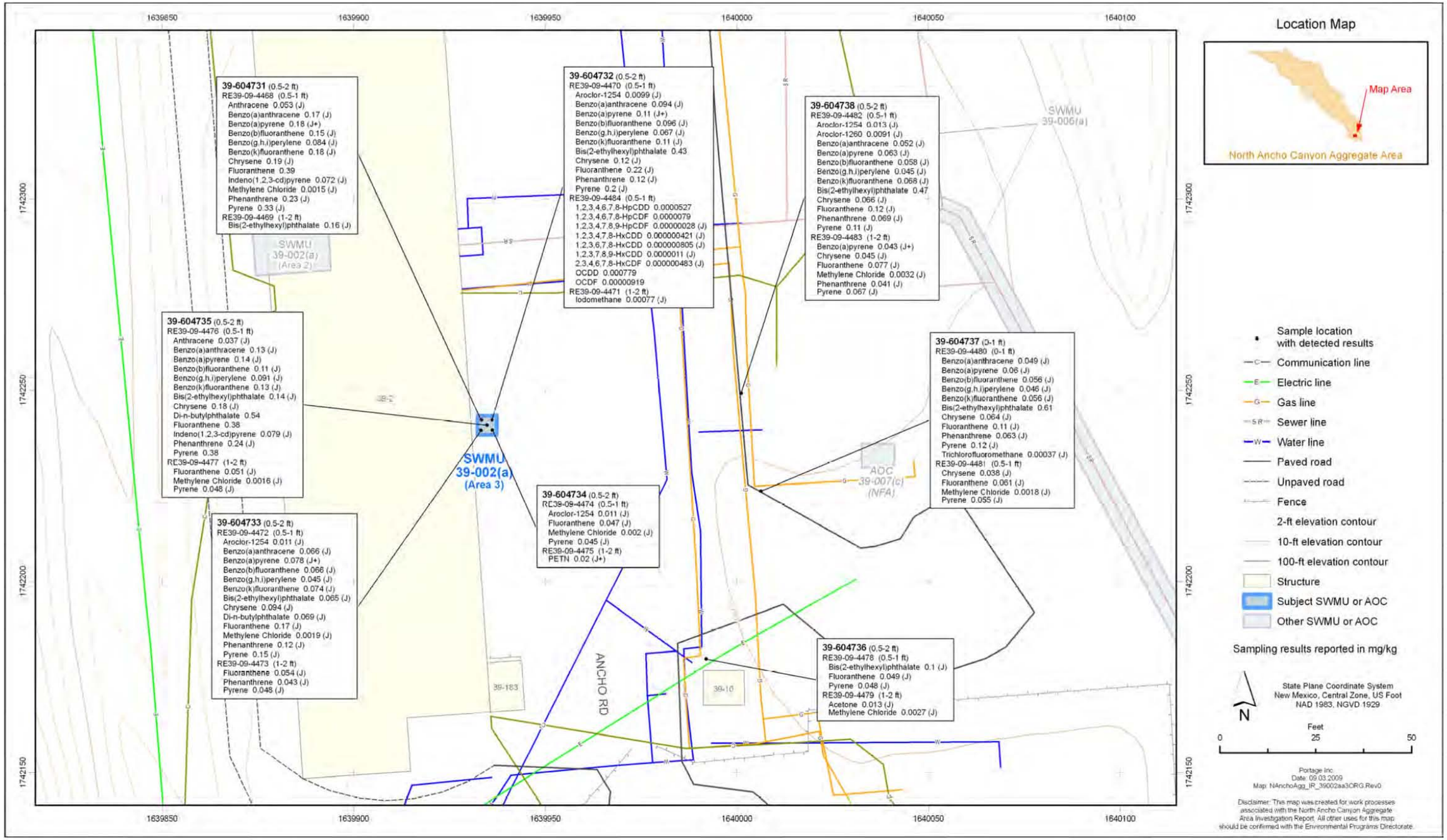

Figure 5.5-3 Organic chemicals detected in samples at SWMU 39-002(a) Area 3

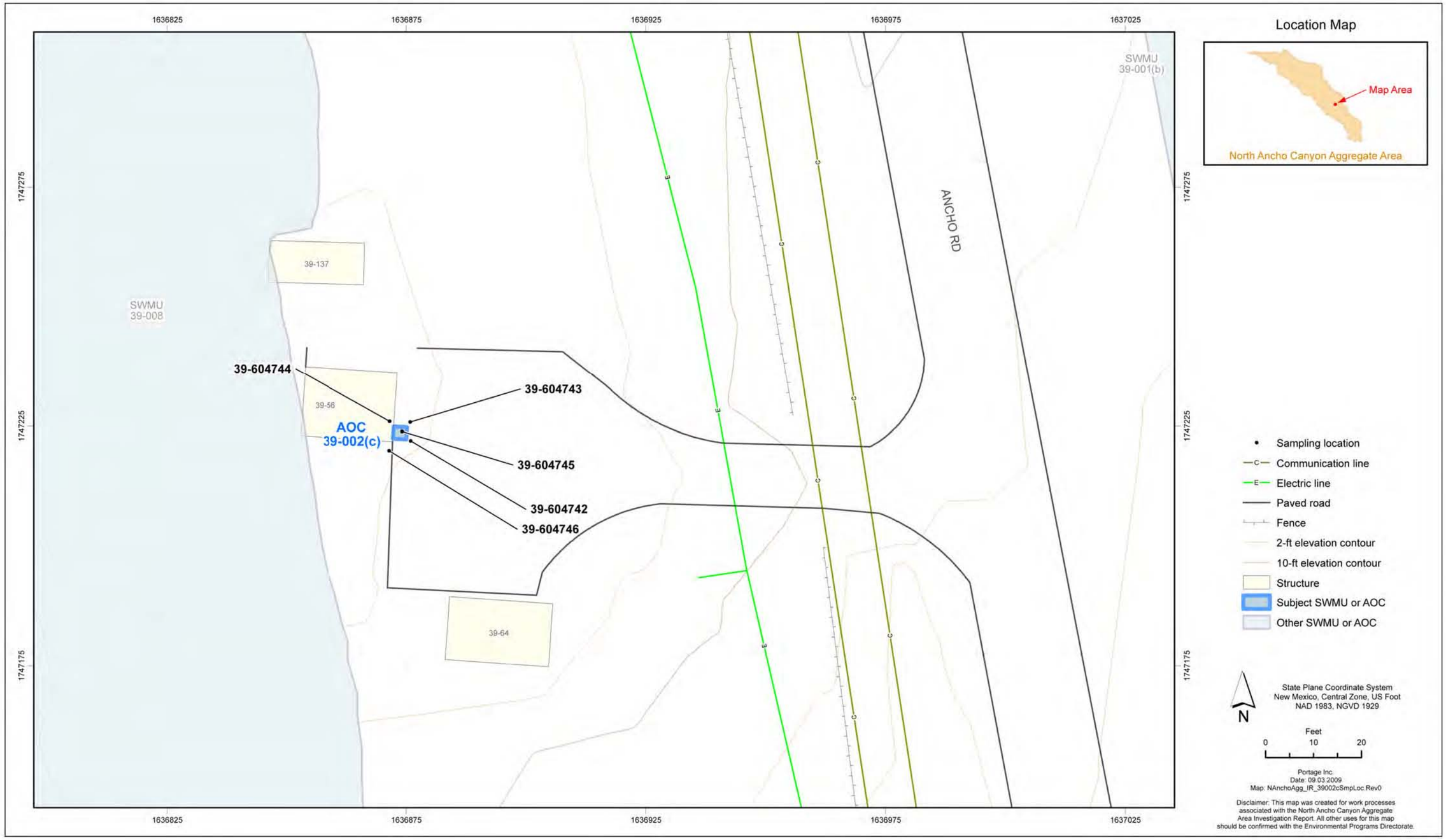

Figure 5.7-1 Locations sampled for AOC 39-002(c)

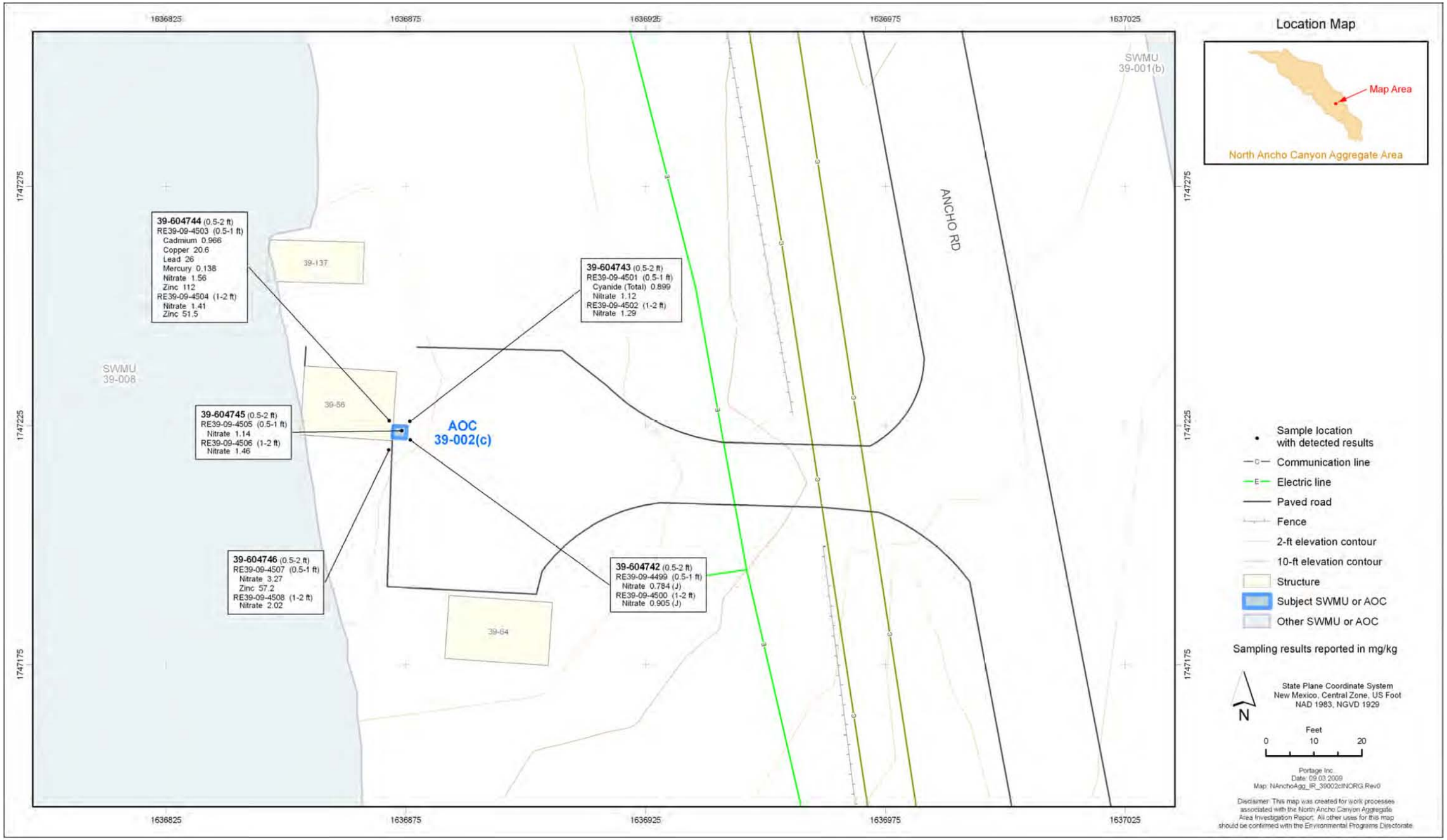

Figure 5.7-2 Inorganic chemicals detected or detected above BVs at AOC 39-002(c)

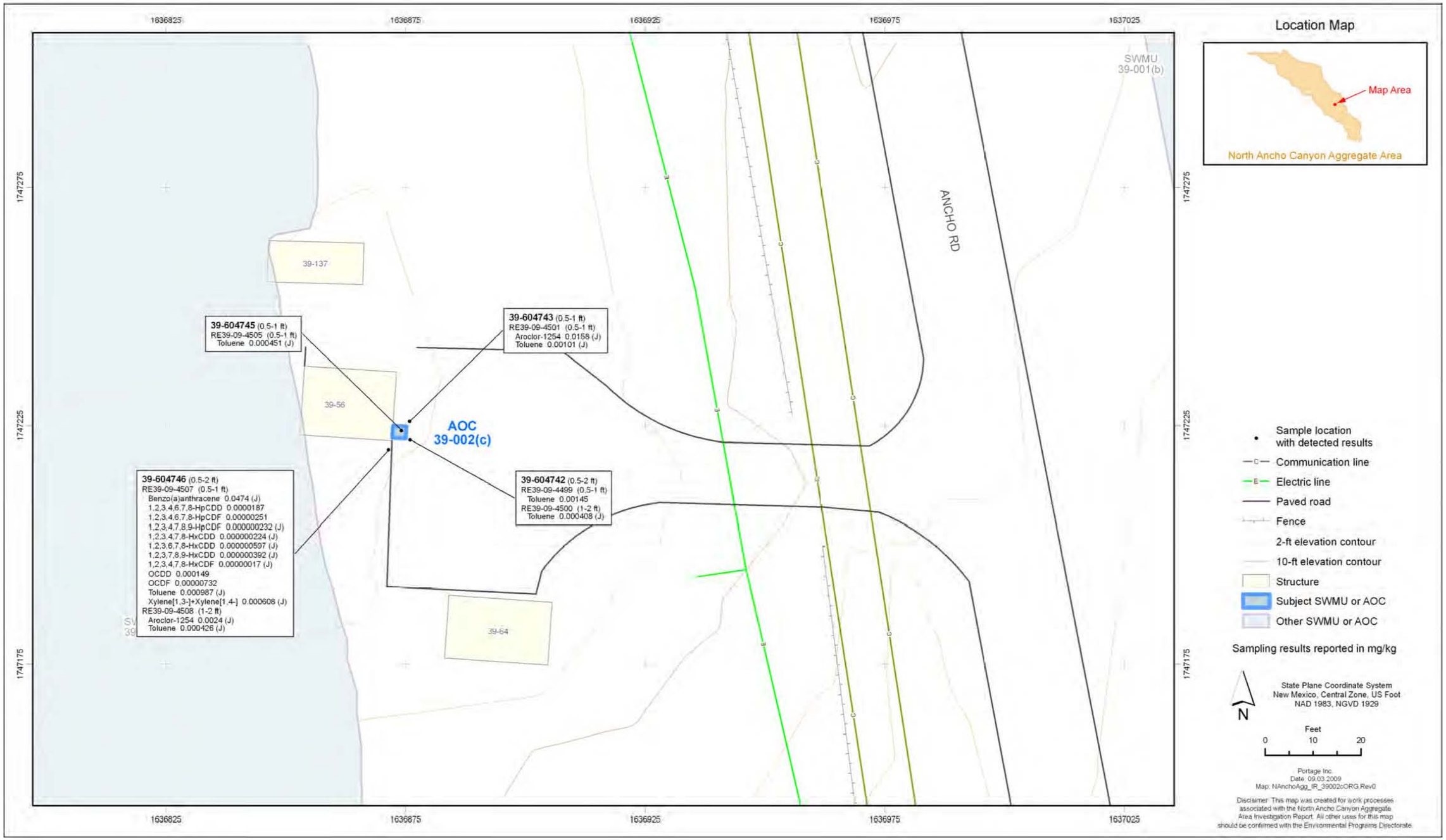

Figure 5.7-3 Organic chemicals detected in samples at AOC 39-002(c)

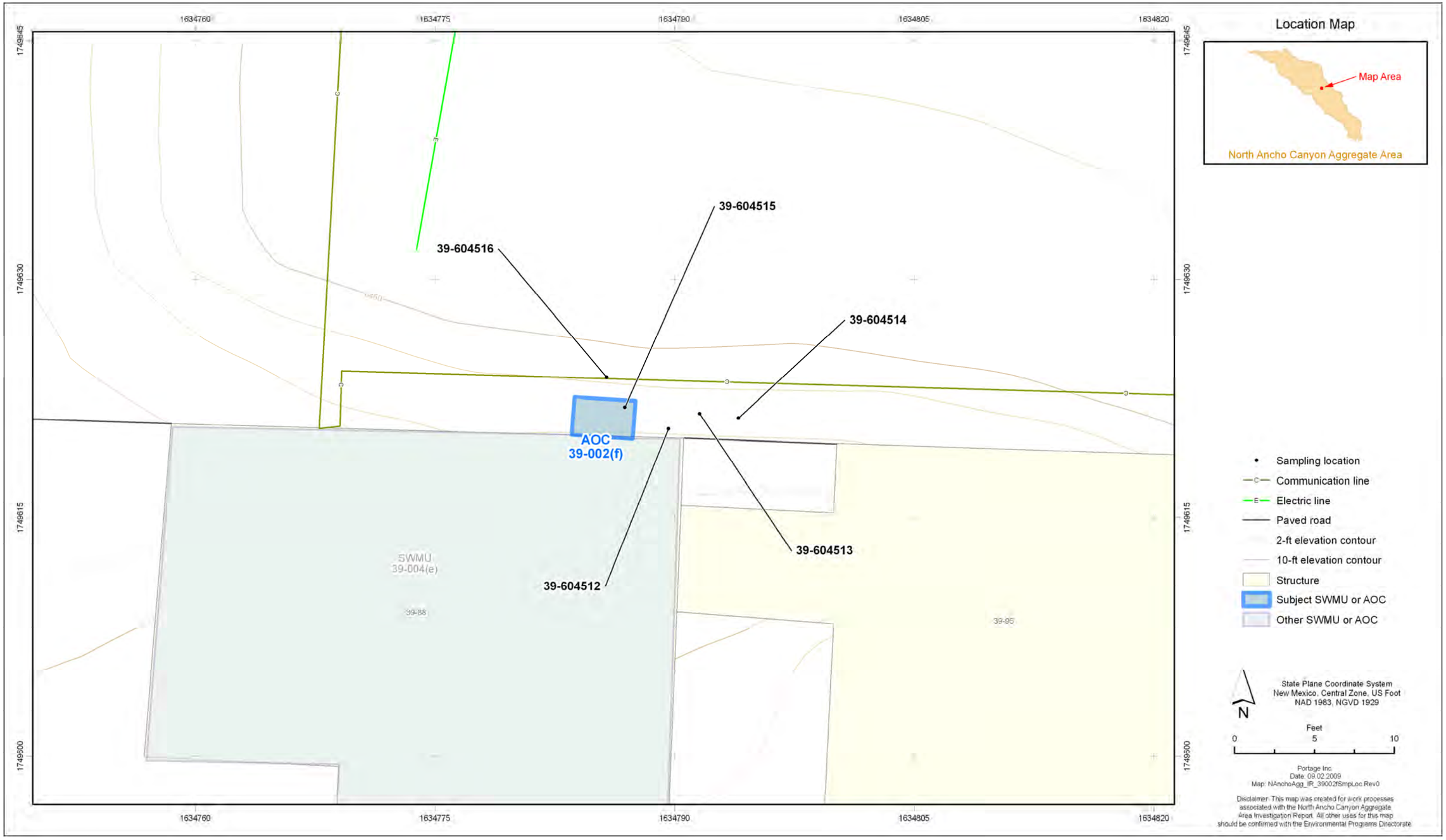

Figure 5.8-1 Locations Sampled for AOC 39-002(f)

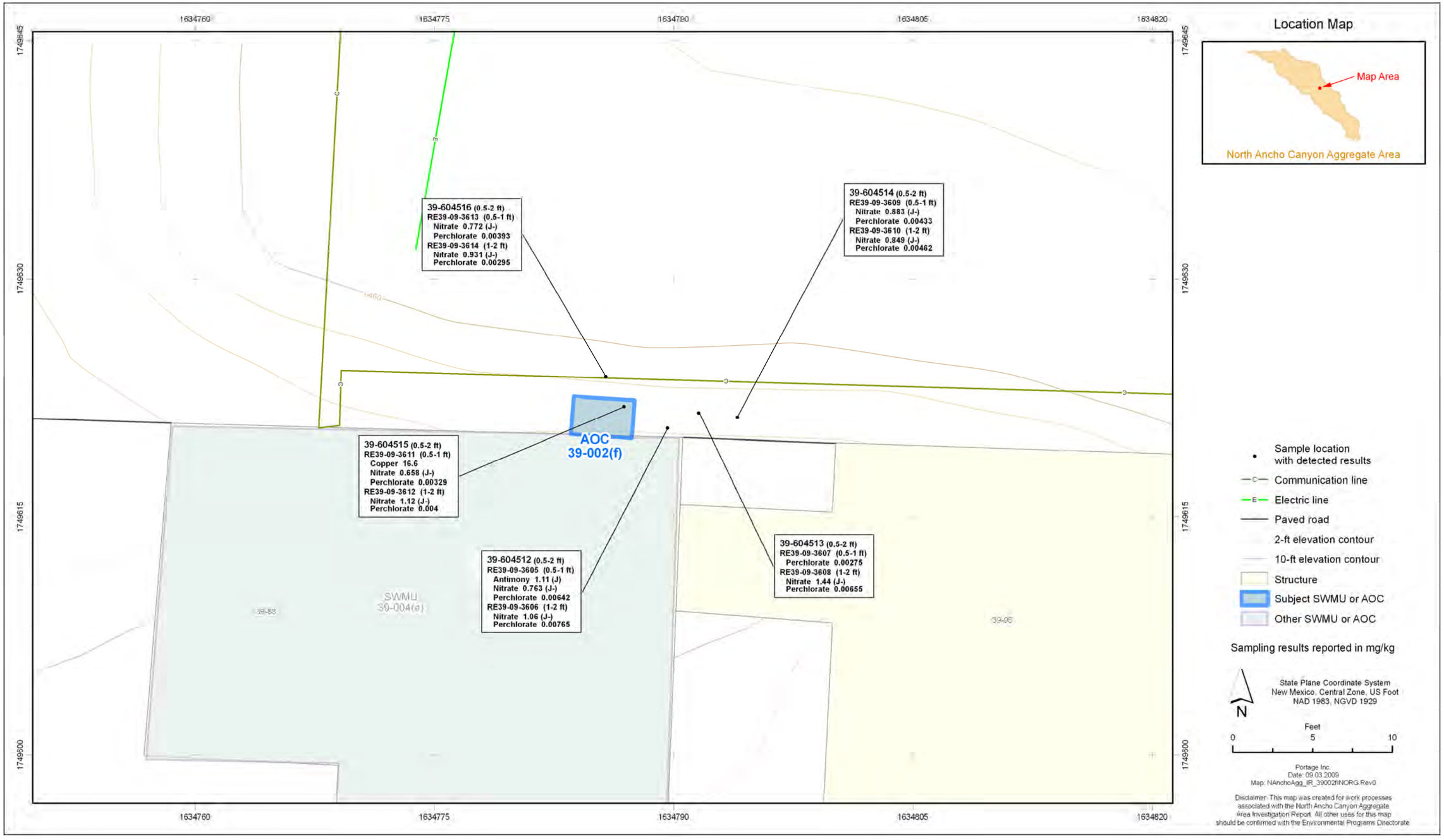

Figure 5.8-2 Inorganic chemicals detected or detected above BVs at AOC 39-002(f)

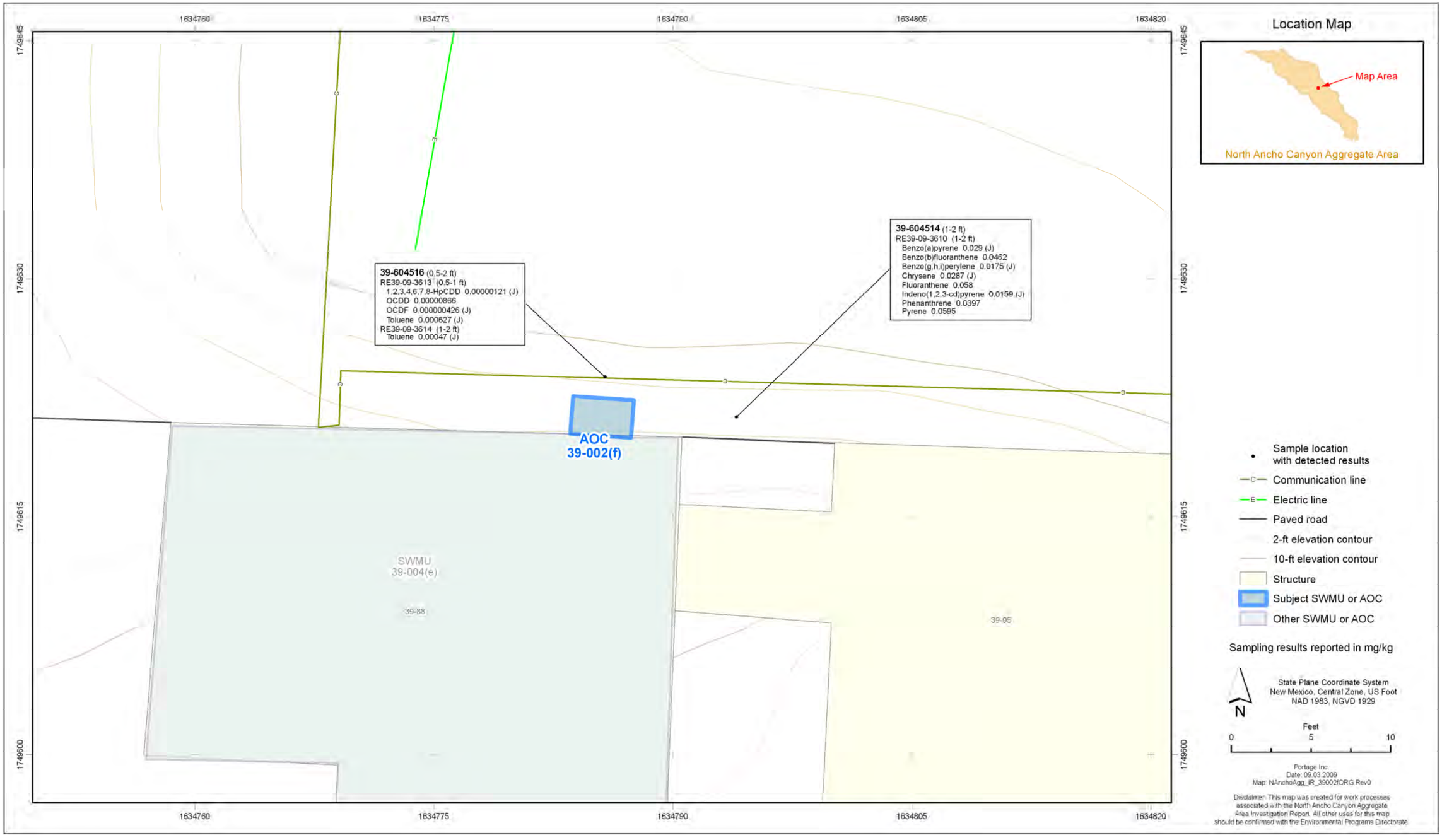

Figure 5.8-3 Organic chemicals detected in samples at AOC 39-002(f)

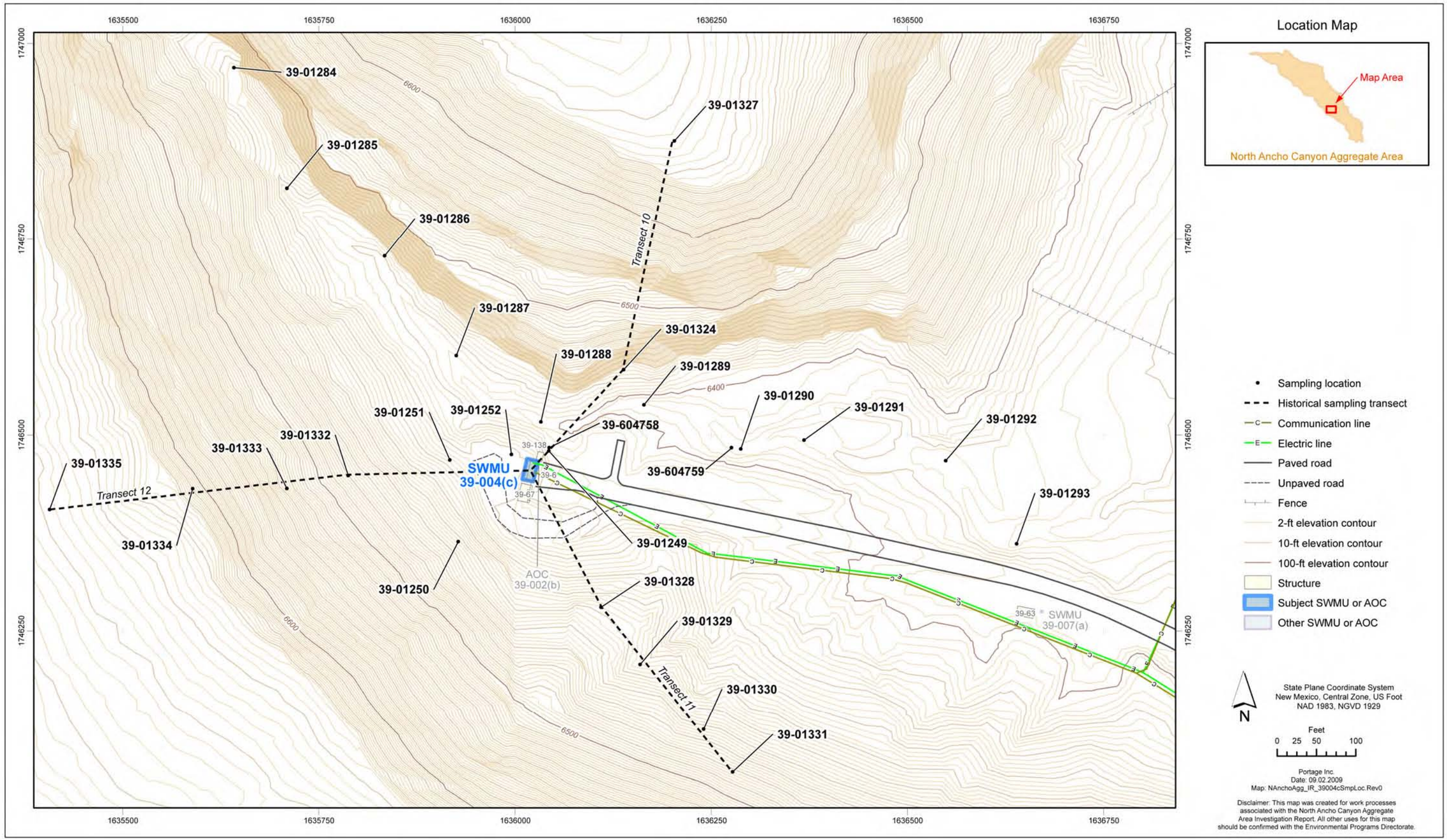

Figure 5.9-1 Locations sampled for SWMU 39-004(c)

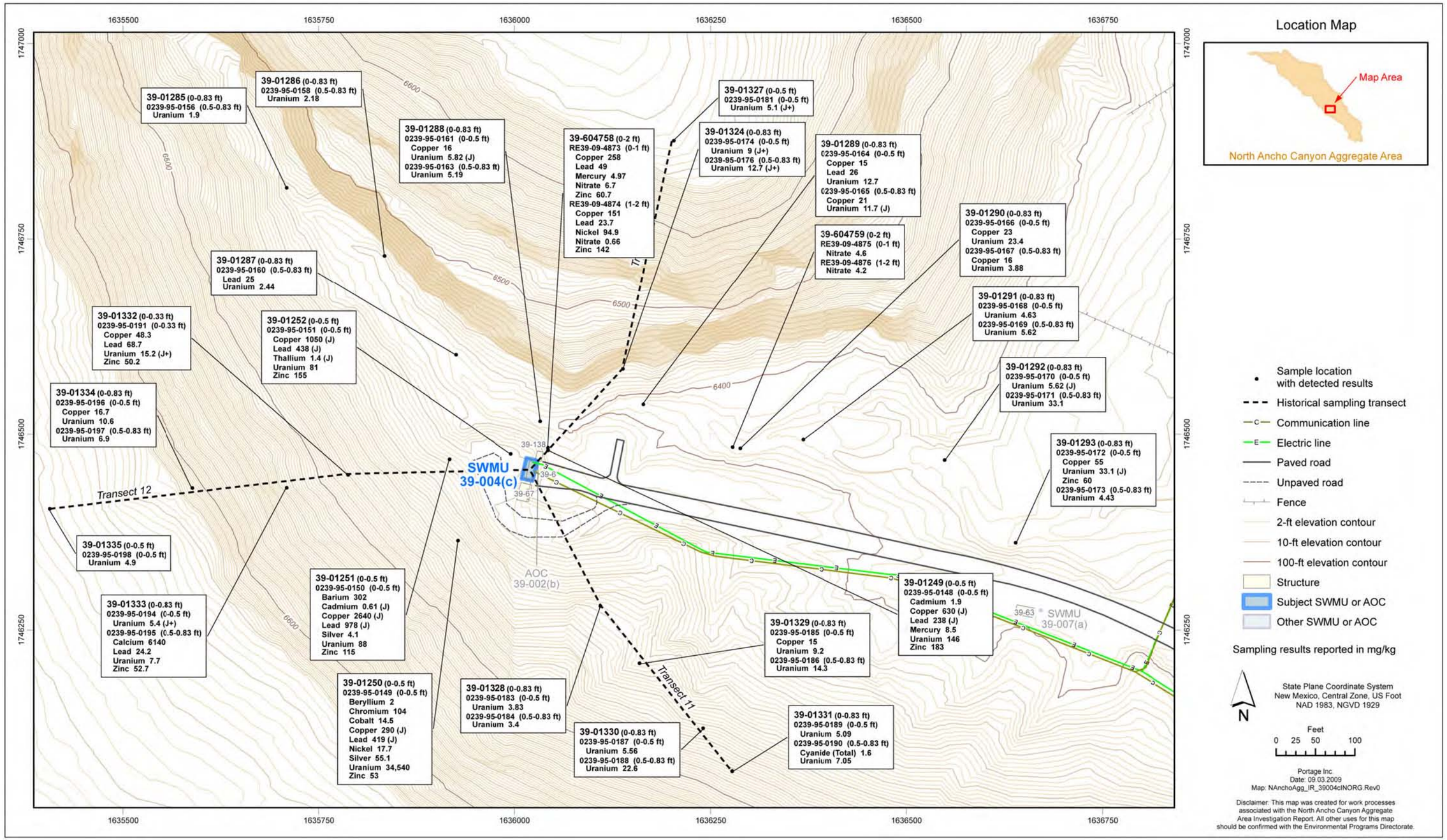

Figure 5.9-2 Inorganic chemicals detected or detected above BVs at SWMU 39-004(c)

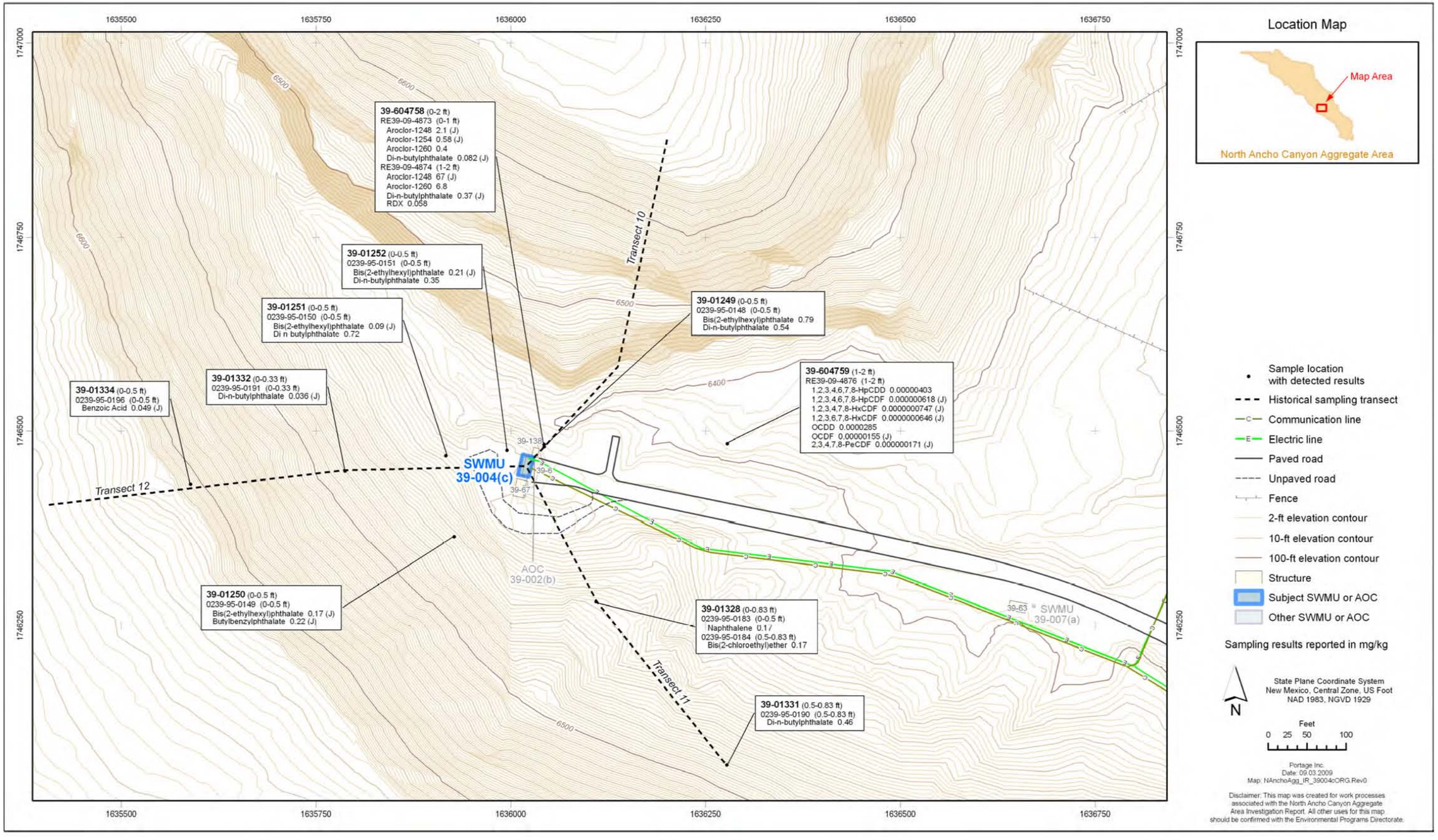

Figure 5.9-3 Organic chemicals detected in samples at SWMU 39-004(c)

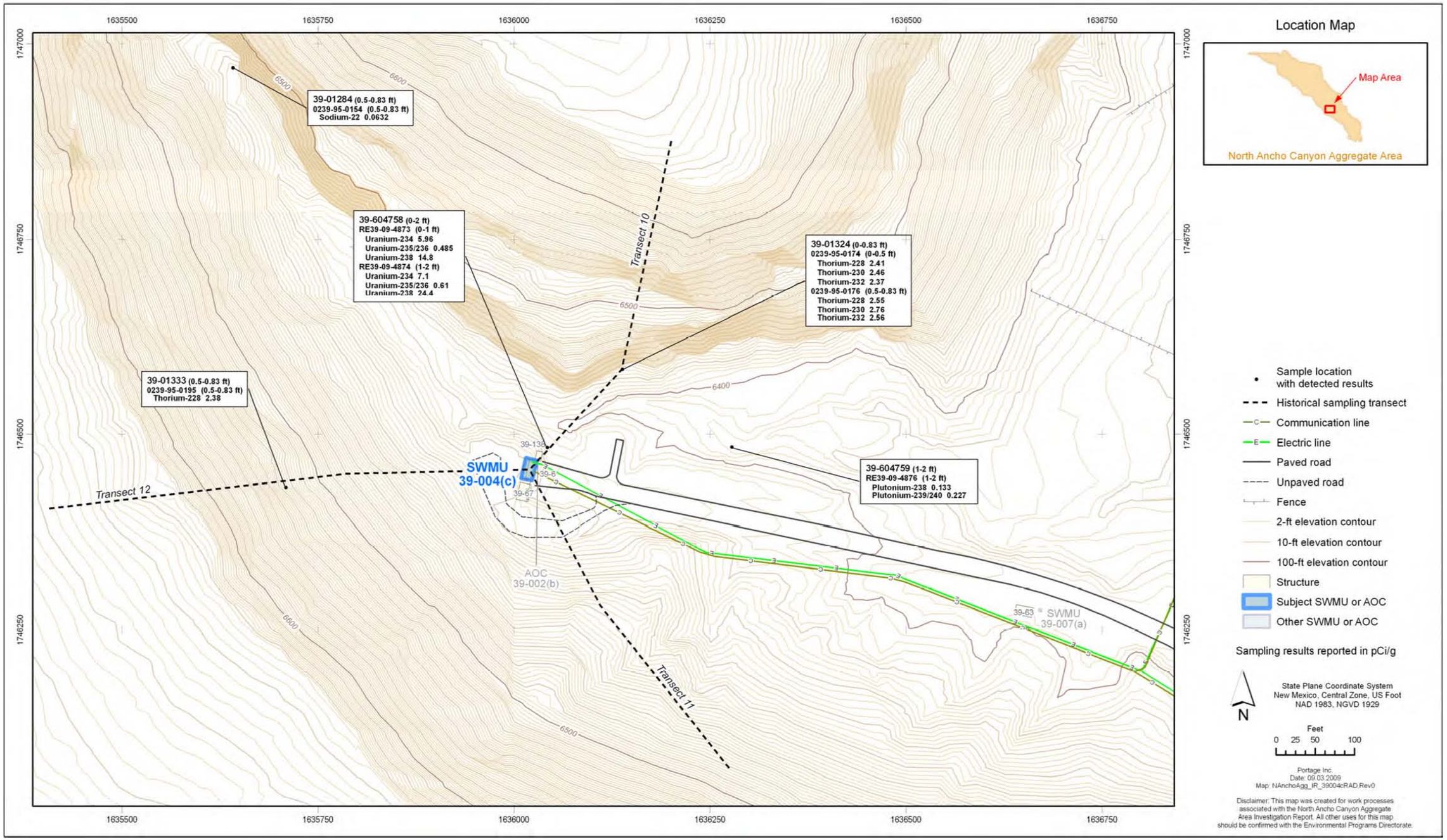

Figure 5.9-4 Radionuclides detected or detected above BVs/FVs at SWMU 39-004(c)

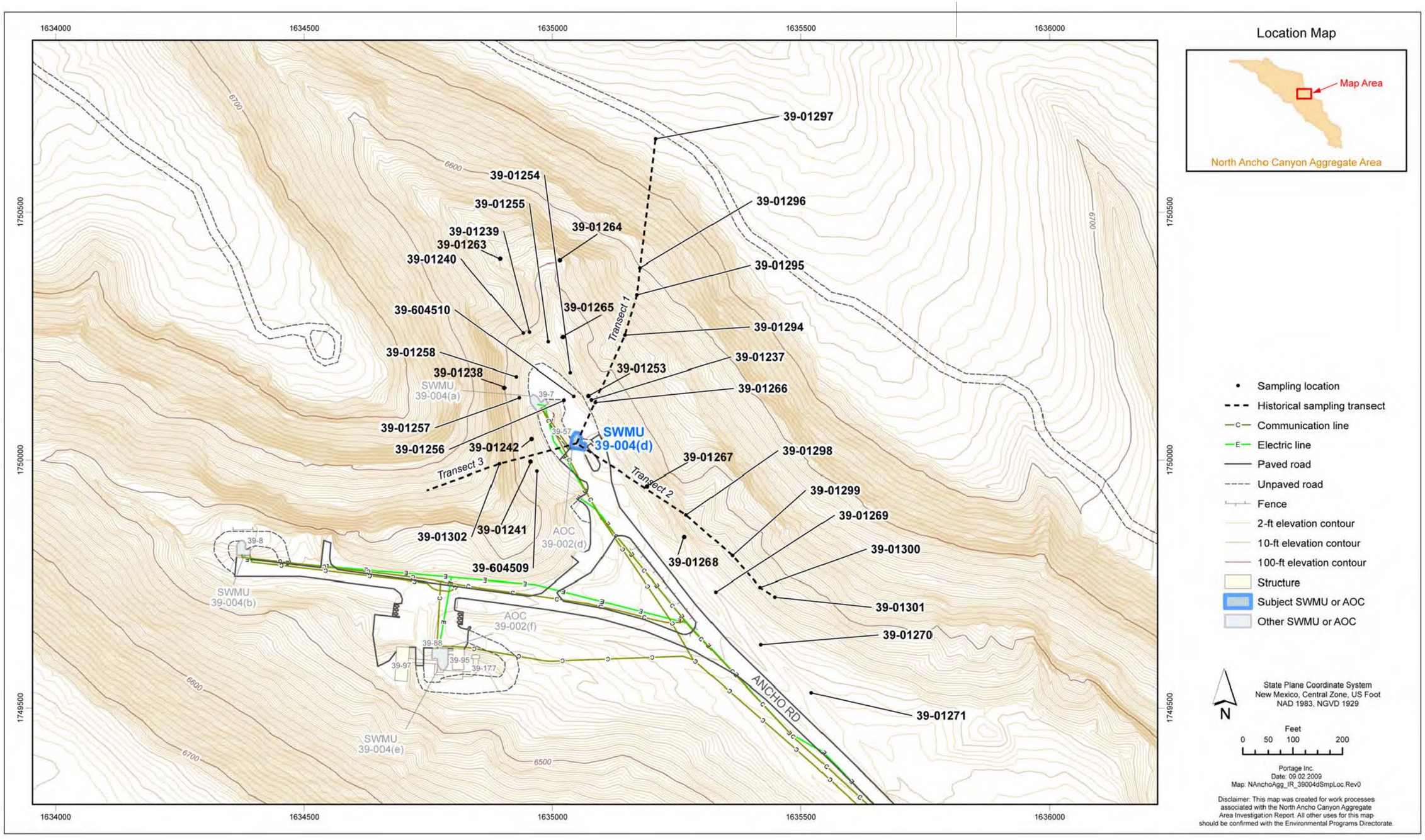

Figure 5.10-1 Locations sampled for SWMU 39-004(d)

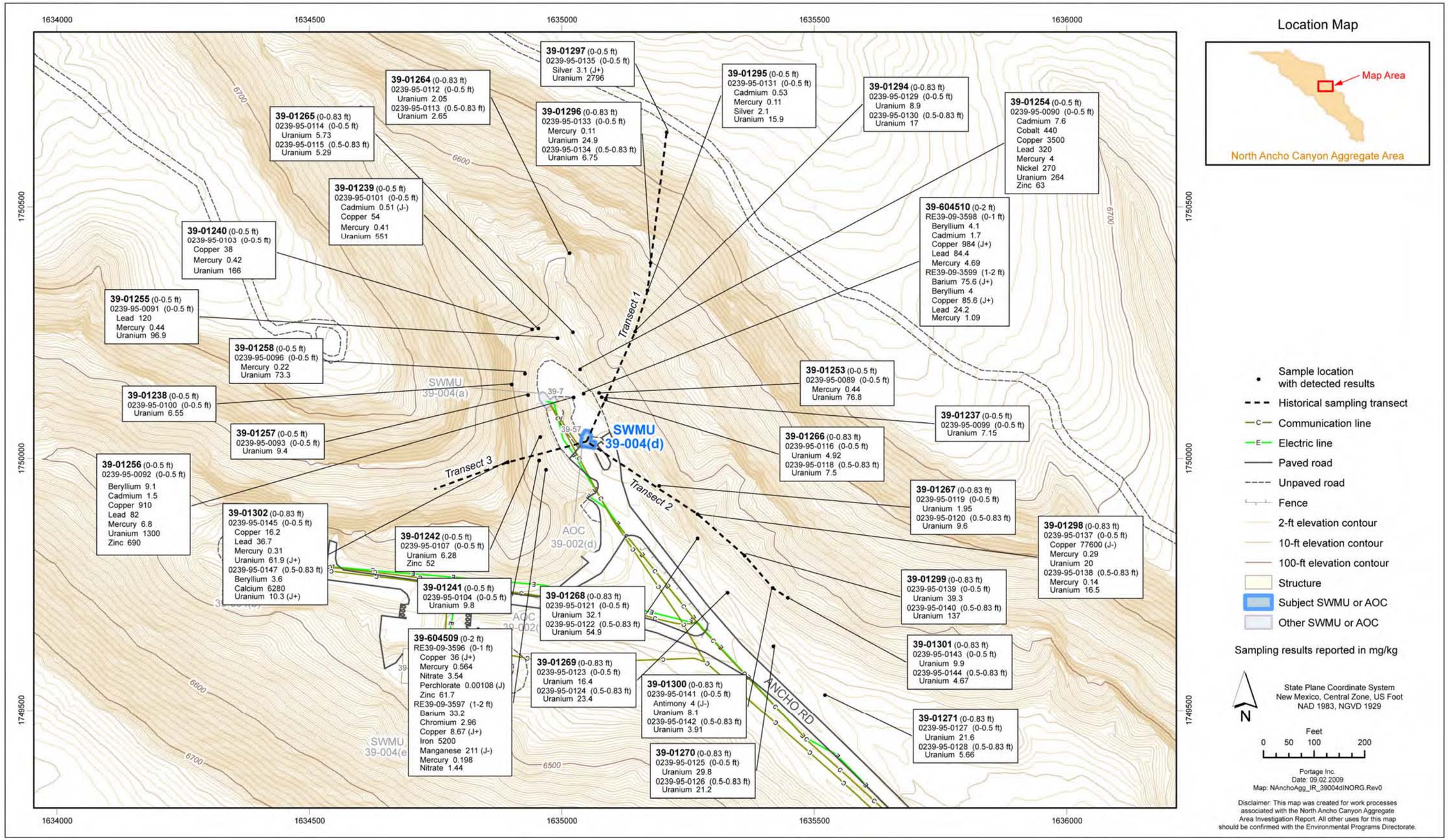

Figure 5.10-2 Inorganic chemicals detected or detected above BVs at SWMU 39-004(d)

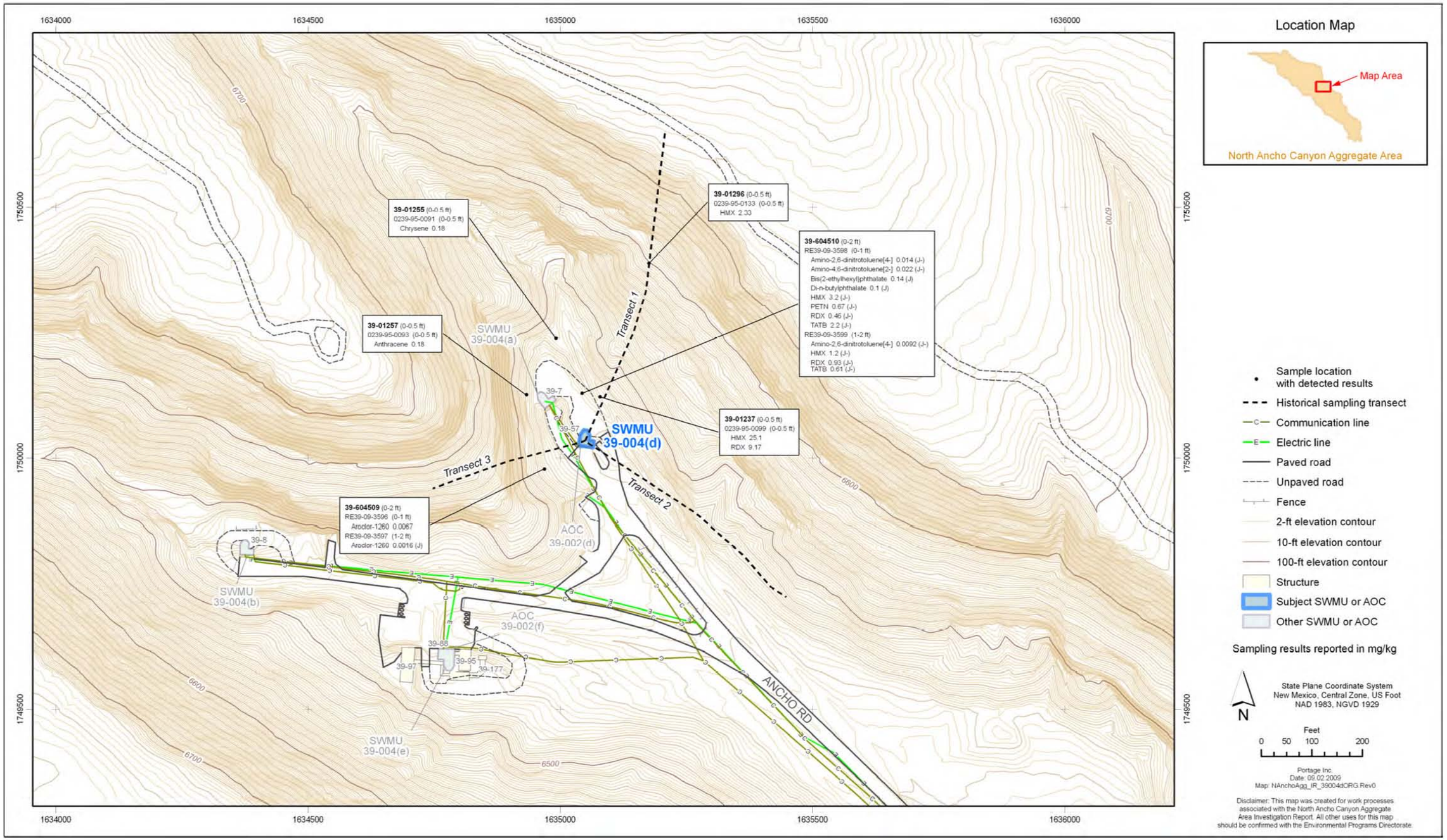

Figure 5.10-3 Organic chemicals detected in samples at SWMU 39-004(d)

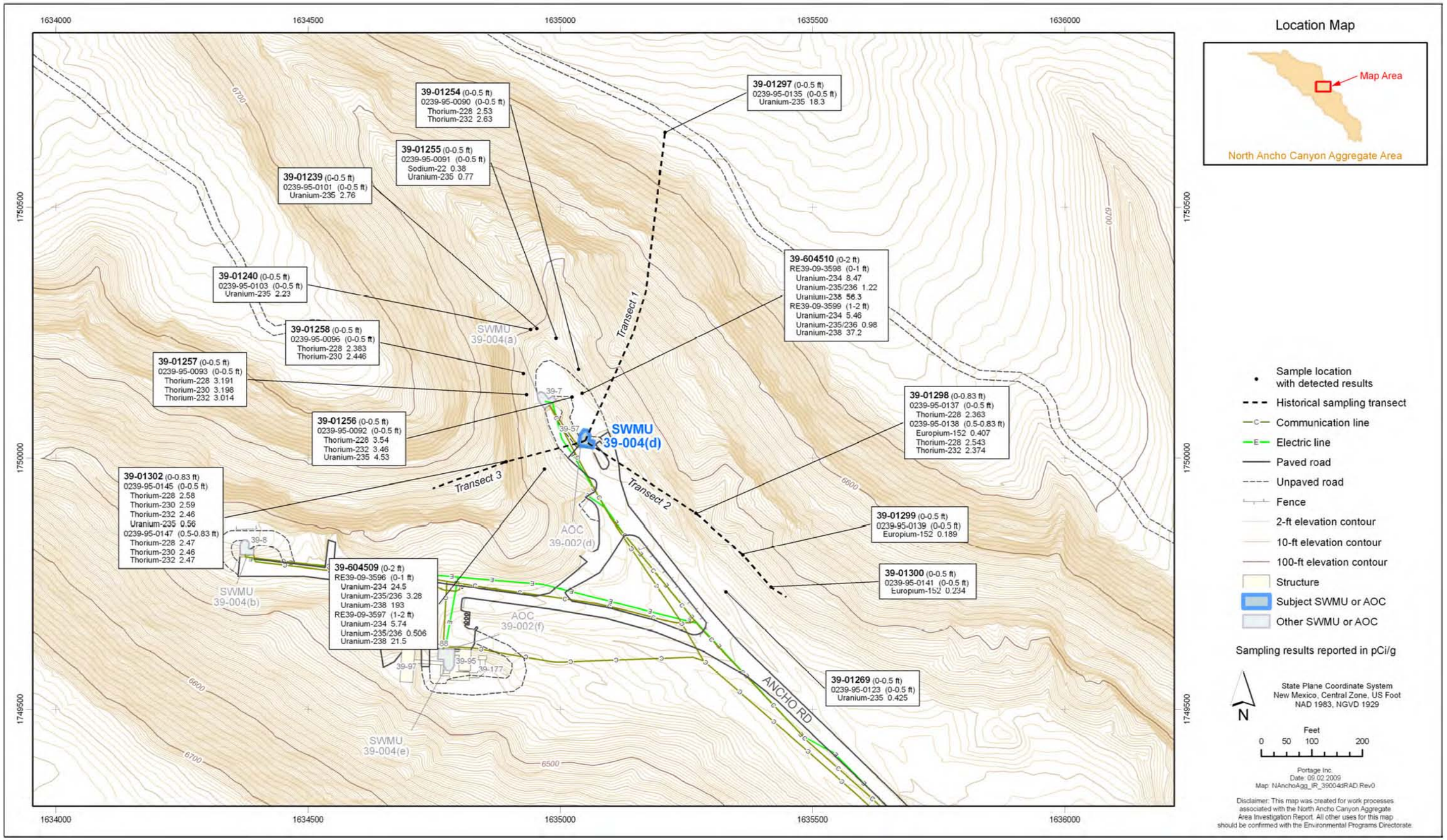

Figure 5.10-4 Radionuclides detected or detected above BVs/FVs at SWMU 39-004(d)

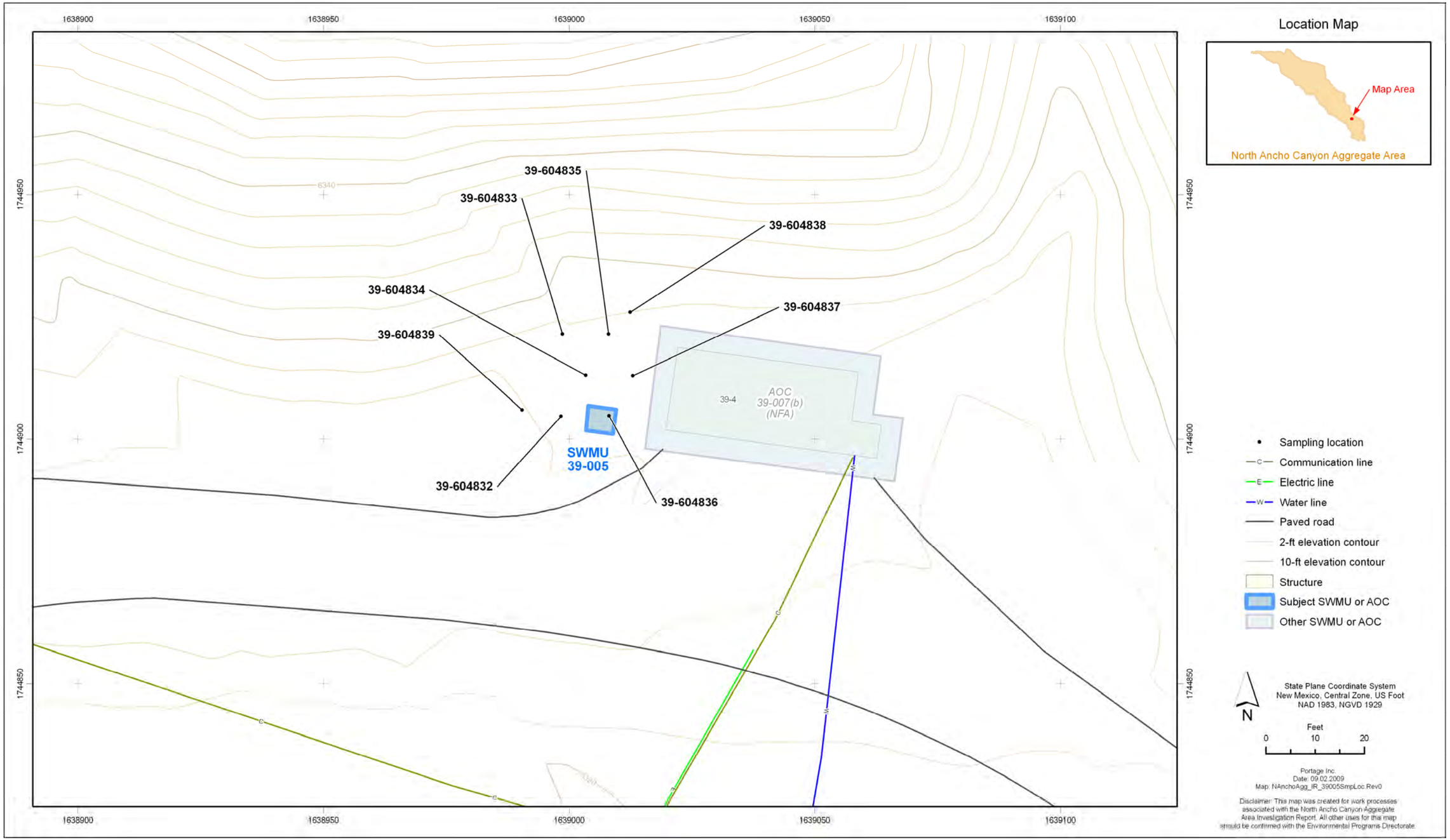

Figure 5.11-1 Locations sampled for SWMU 39-005

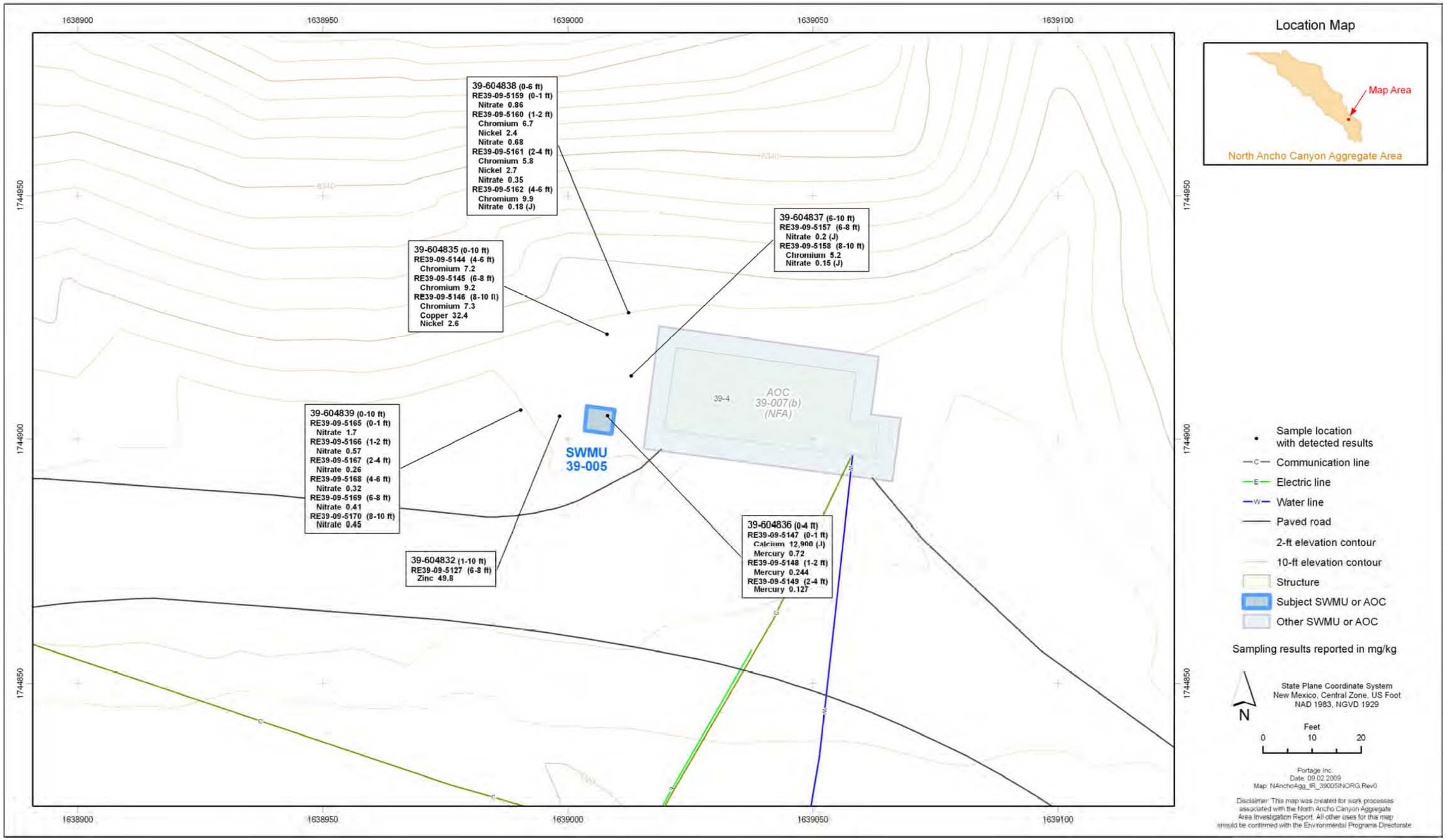

Figure 5.11-2 Inorganic chemicals detected or detected above BVs at SWMU 39-005

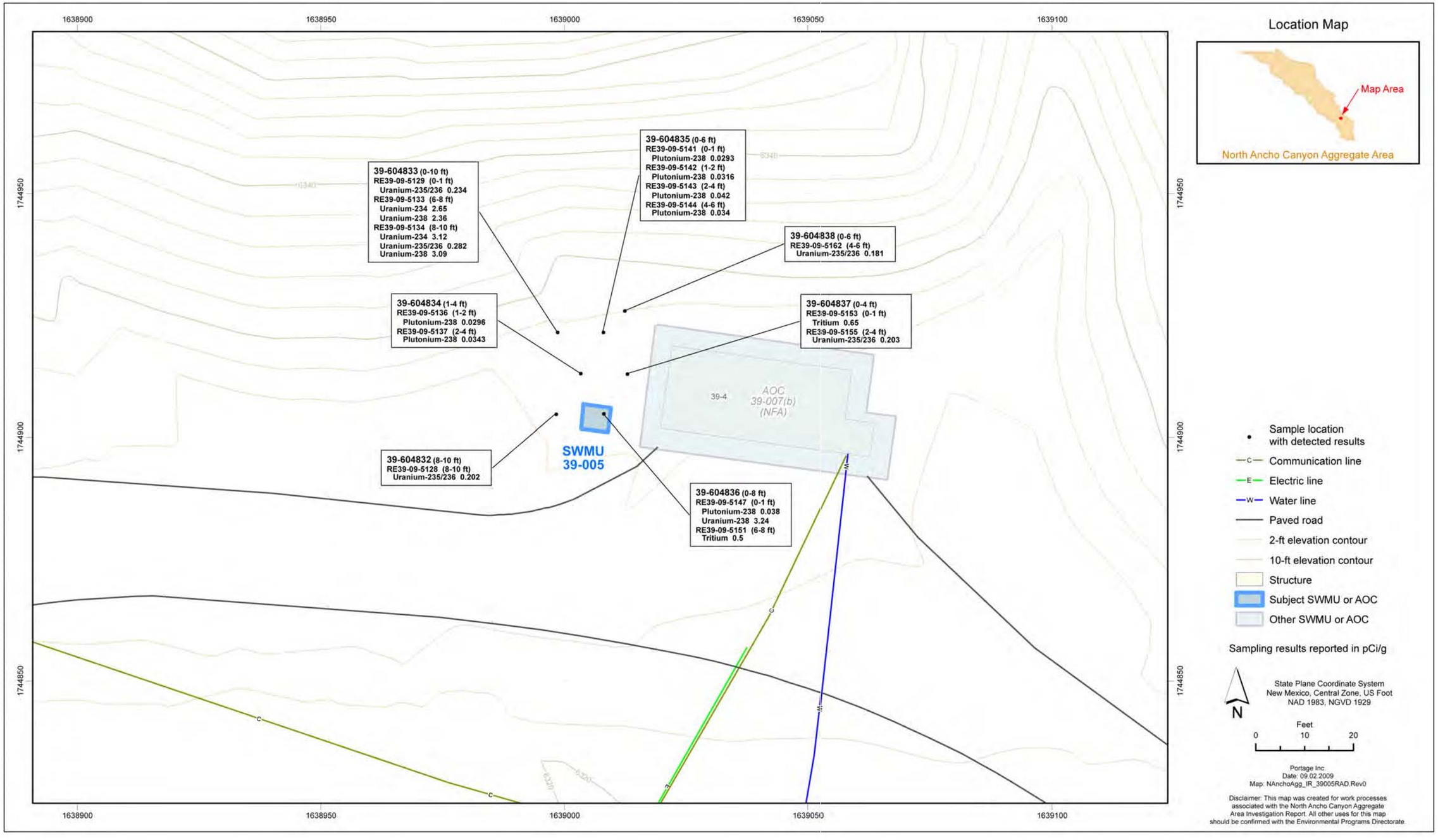

Figure 5.11-3 Radionuclides detected or detected above BVs/FVs at SWMU 39-005

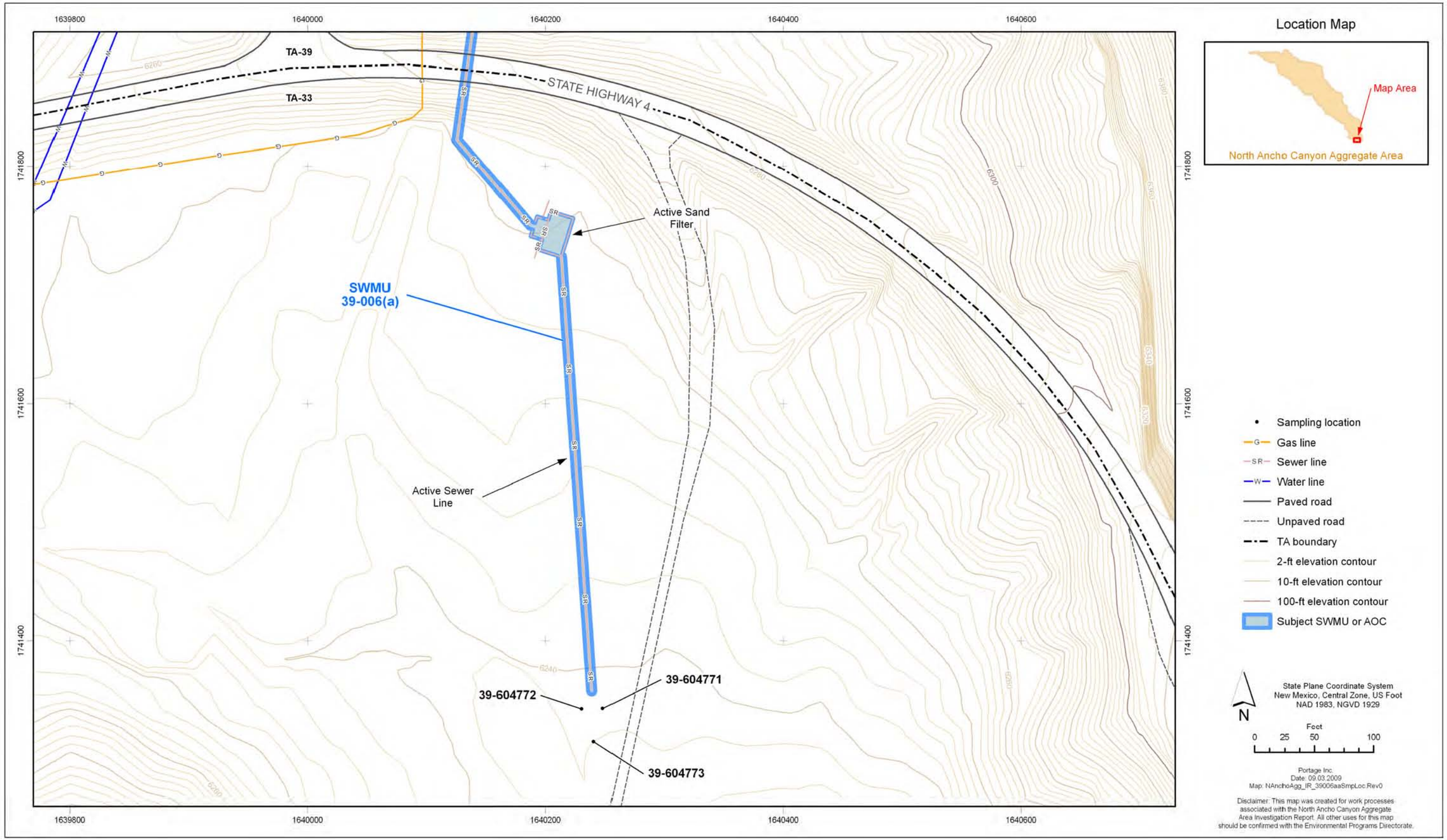

Figure 5.12-1 Locations sampled for SWMU 39-006(a) active components

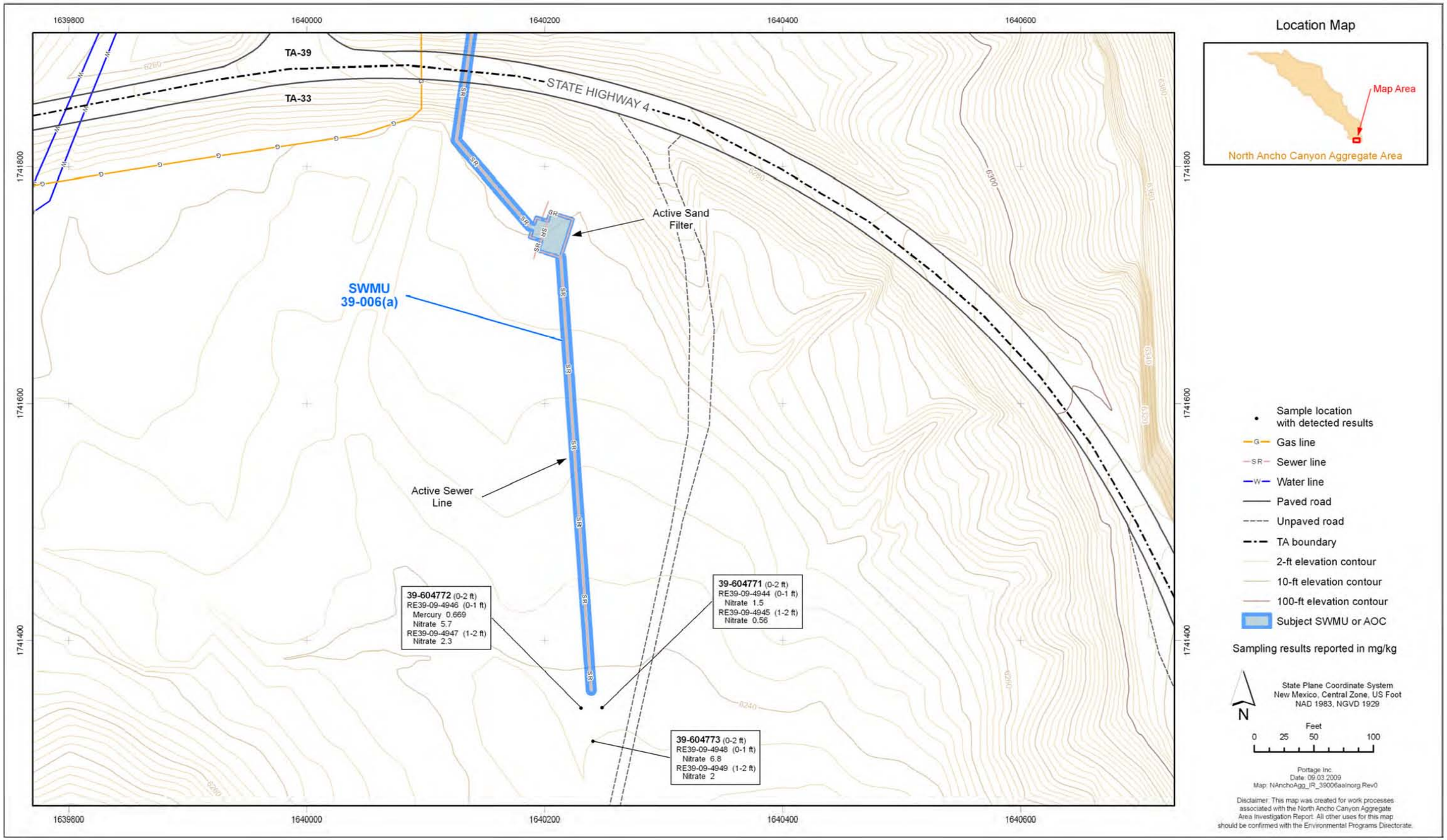

Figure 5.12-2 Inorganic chemicals detected or detected above BVs at SWMU 39-006(a) active components

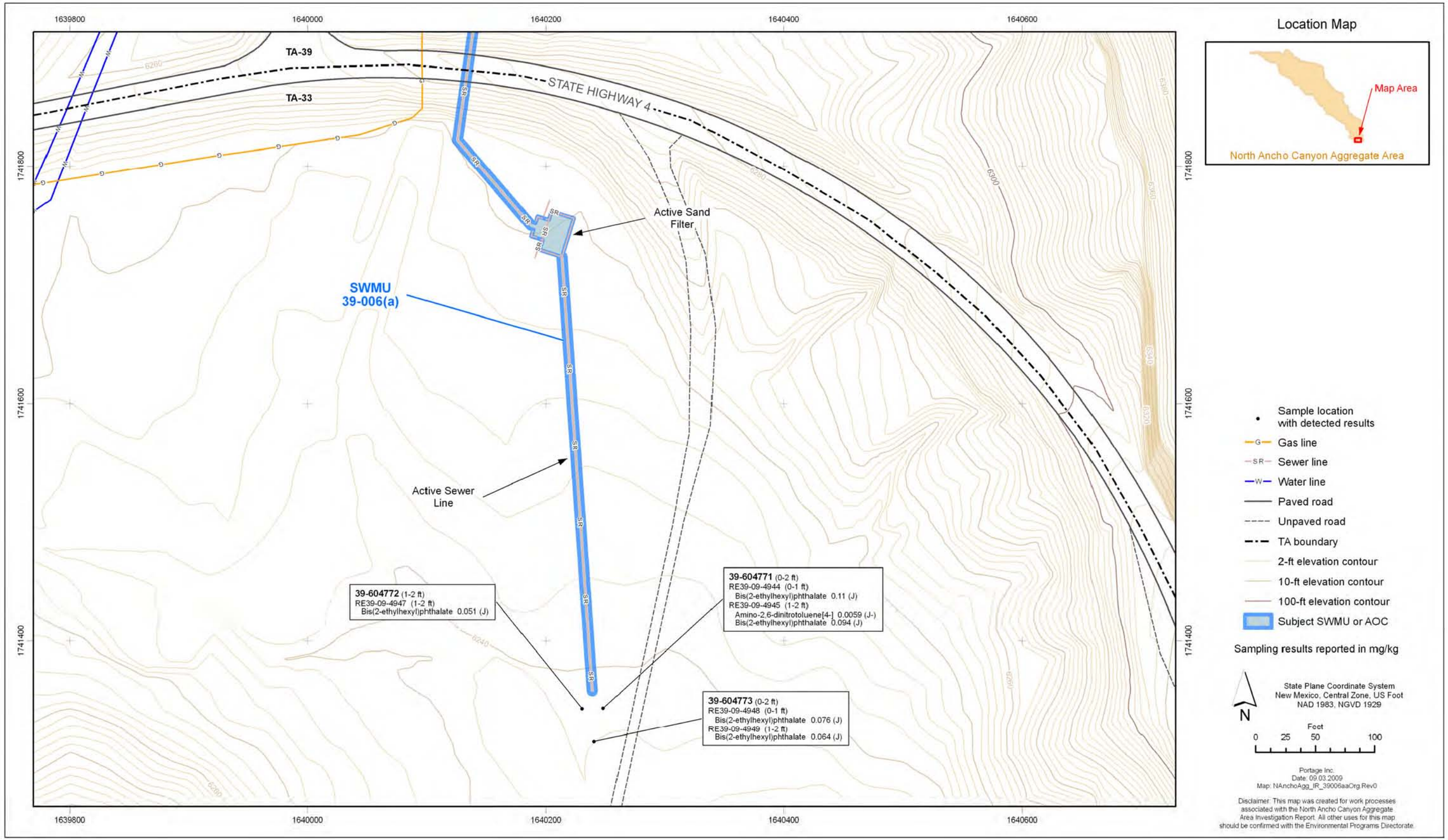

Figure 5.12-3 Organic chemicals detected in samples at SWMU 39-006(a) active components

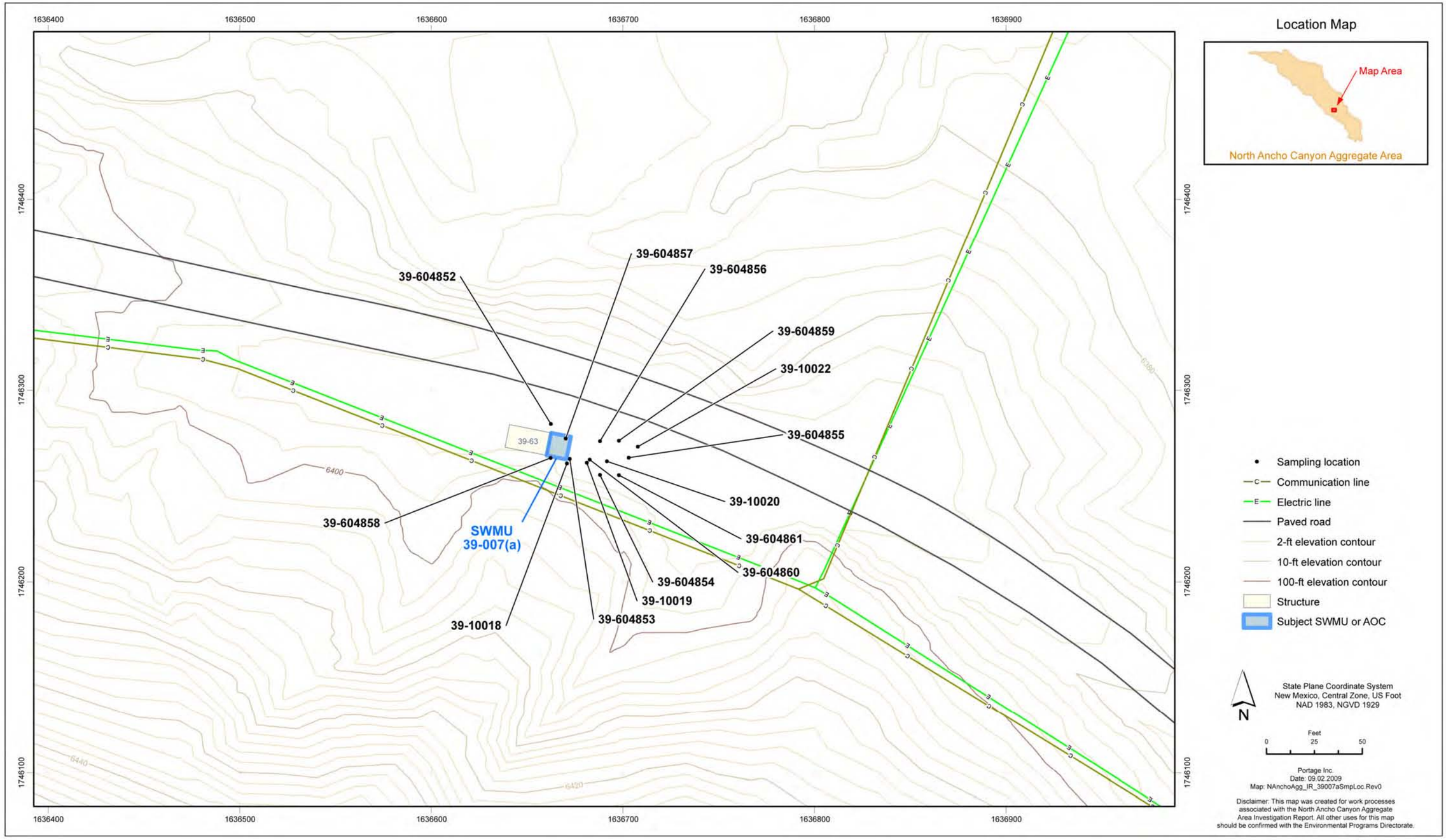

Figure 5.13-1 Locations sampled for SWMU 39-007(a)

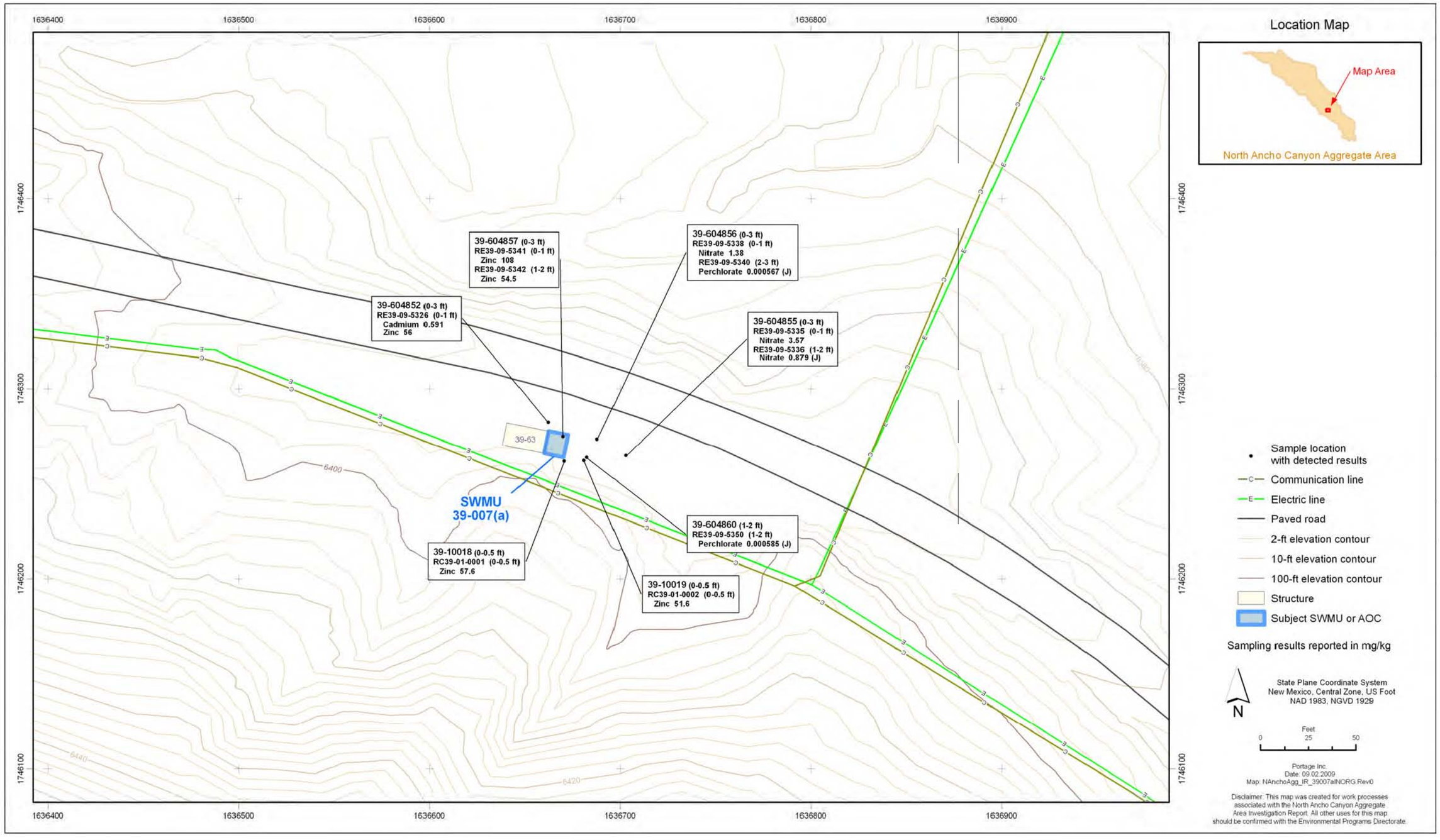

Figure 5.13-2 Inorganic chemicals detected or detected above BVs at SWMU 39-007(a)

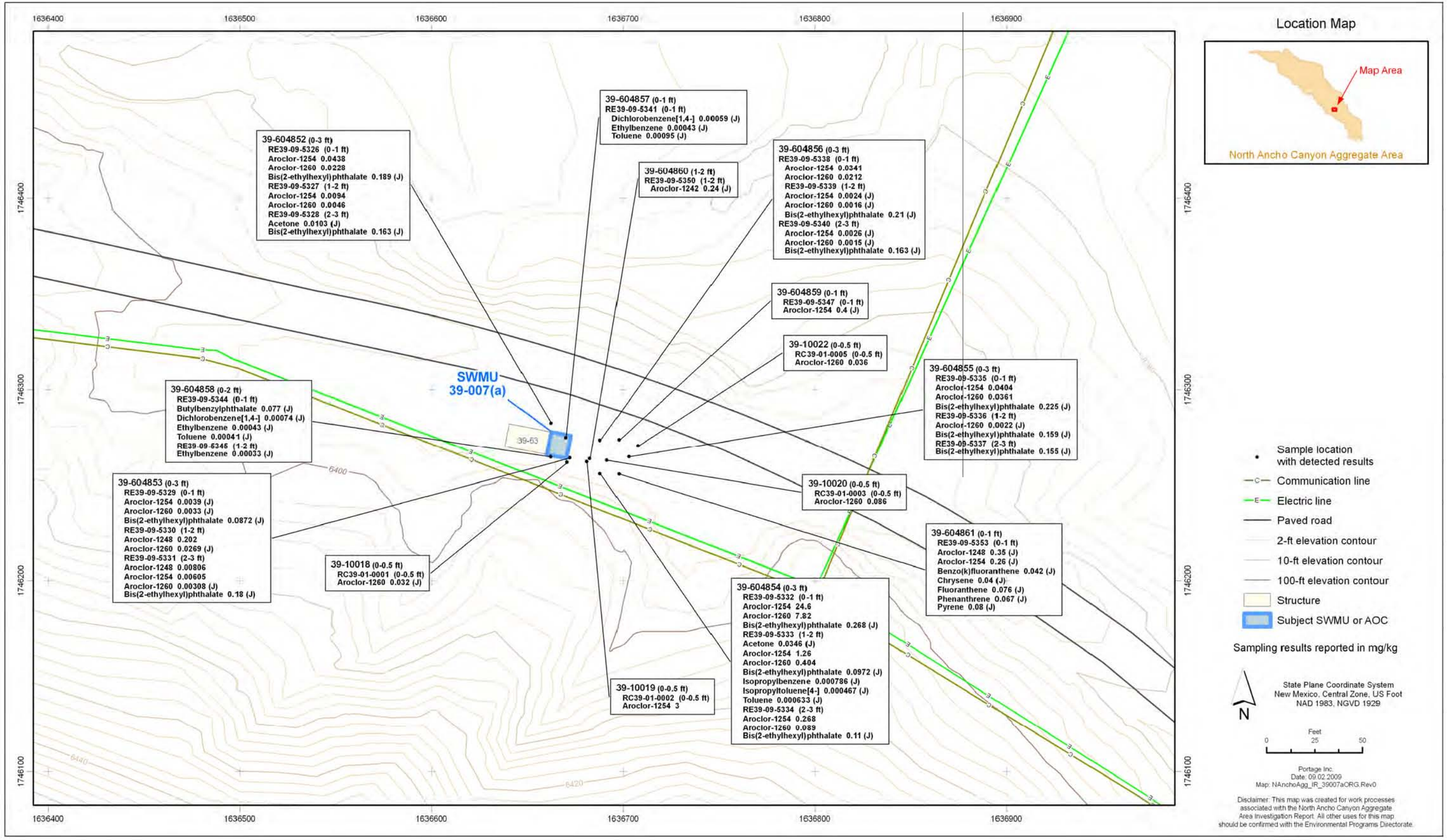

Figure 5.13-3 Organic chemicals detected in samples at SWMU 39-007(a)

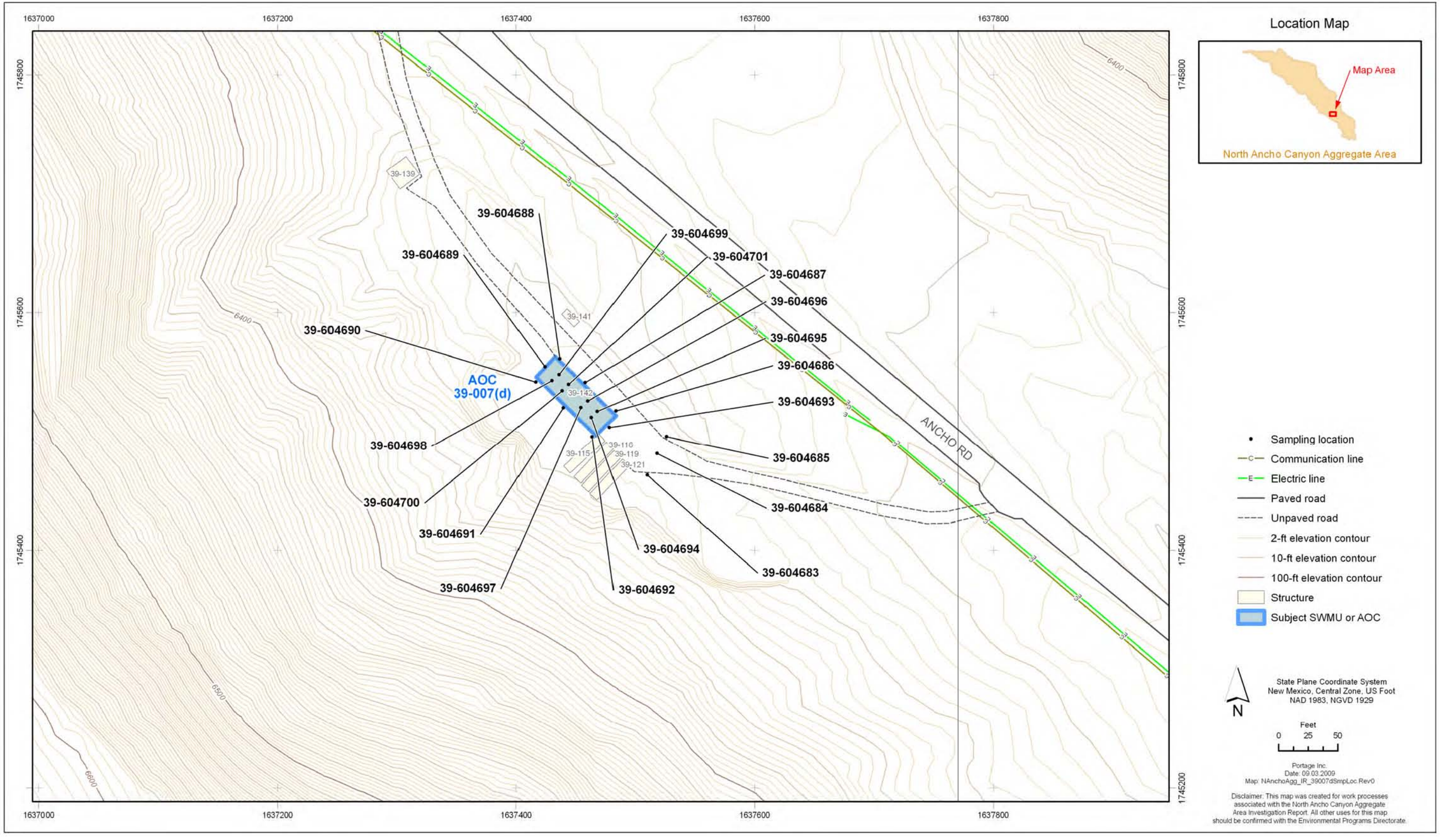

Figure 5.14-1 Locations sampled for AOC 39-007(d)

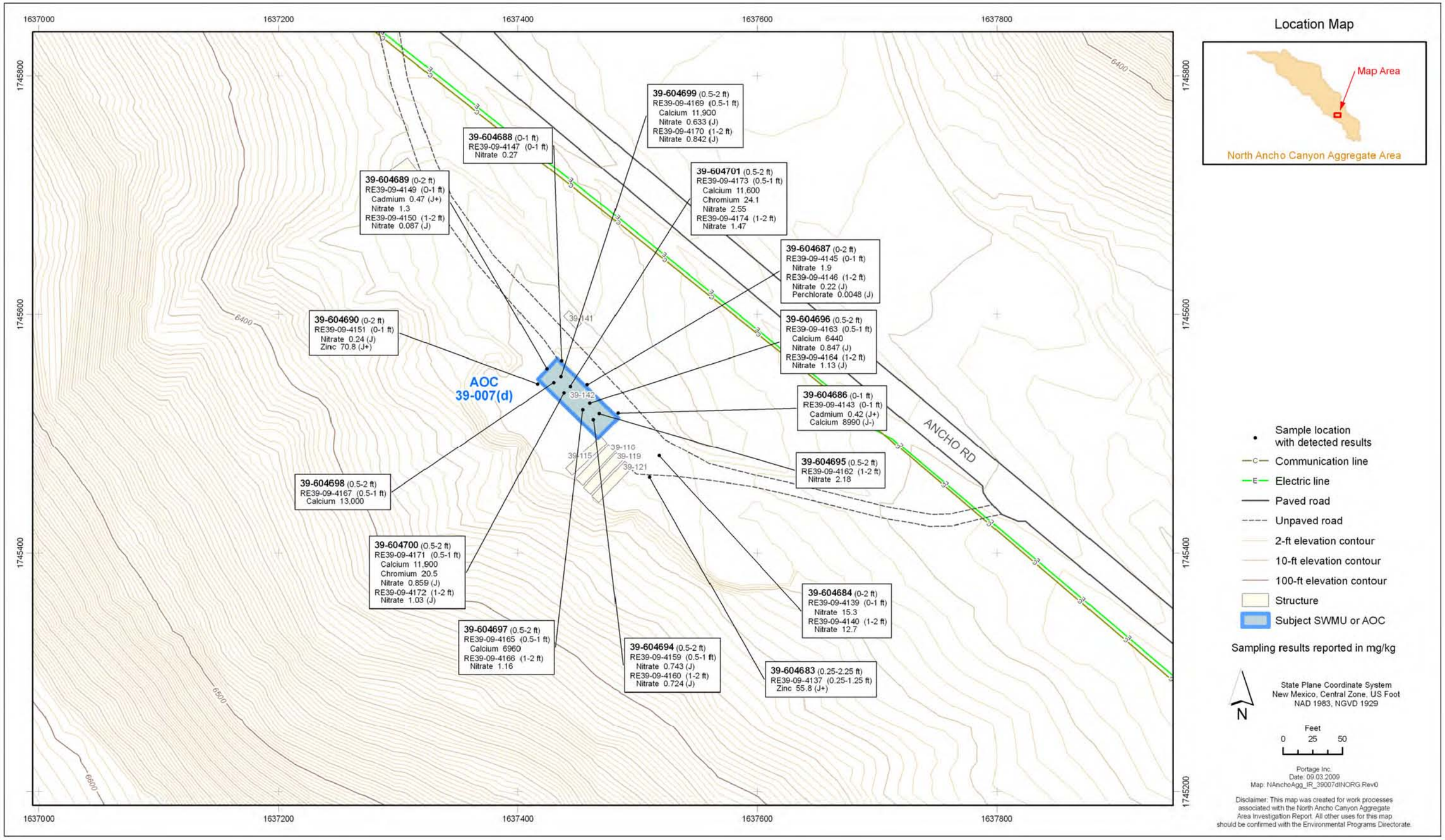

Figure 5.14-2 Inorganic chemicals detected or detected above BVs at AOC 39-007(d)

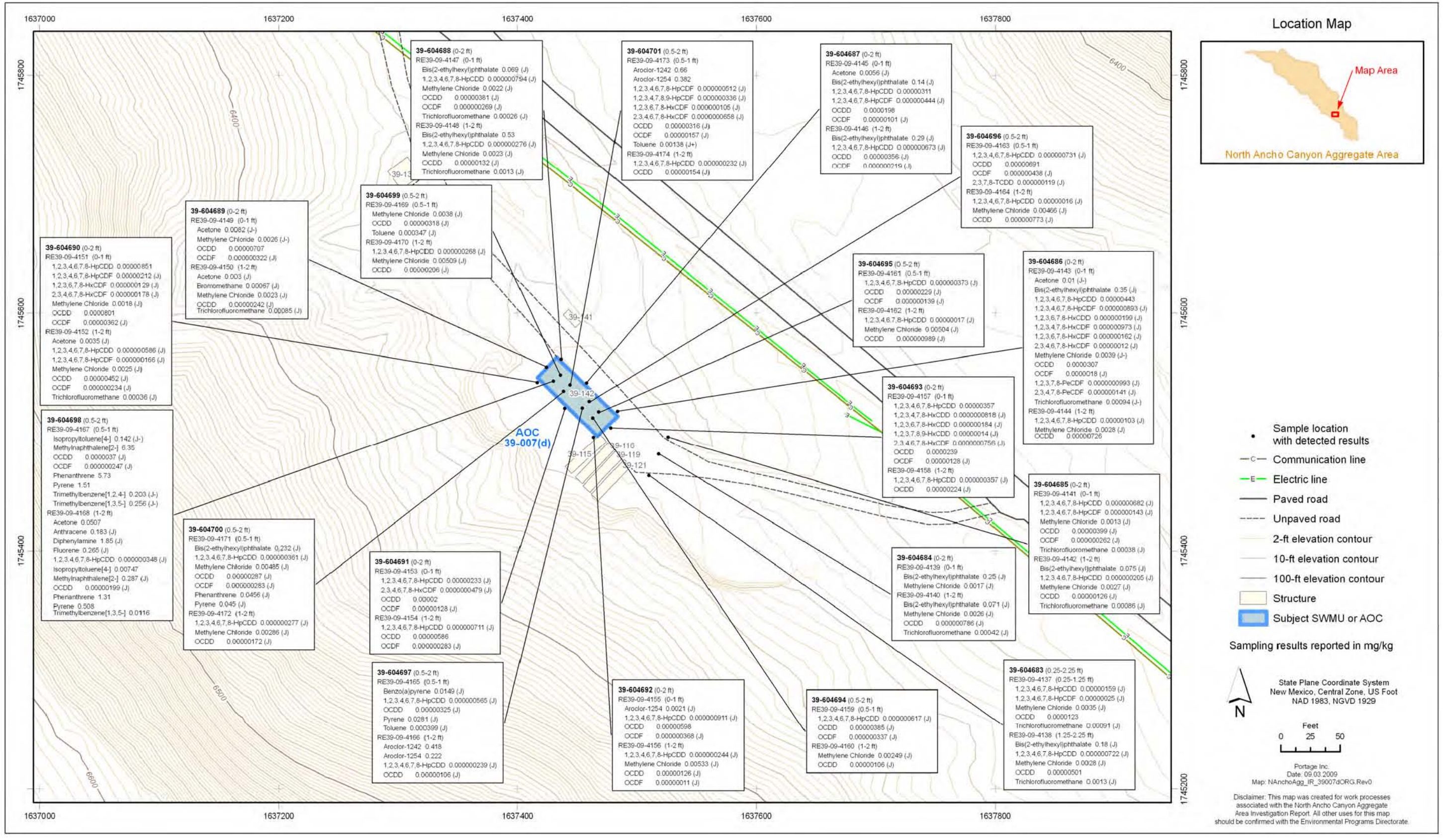

Figure 5.14-3 Organic chemicals detected in samples at AOC 39-007(d)

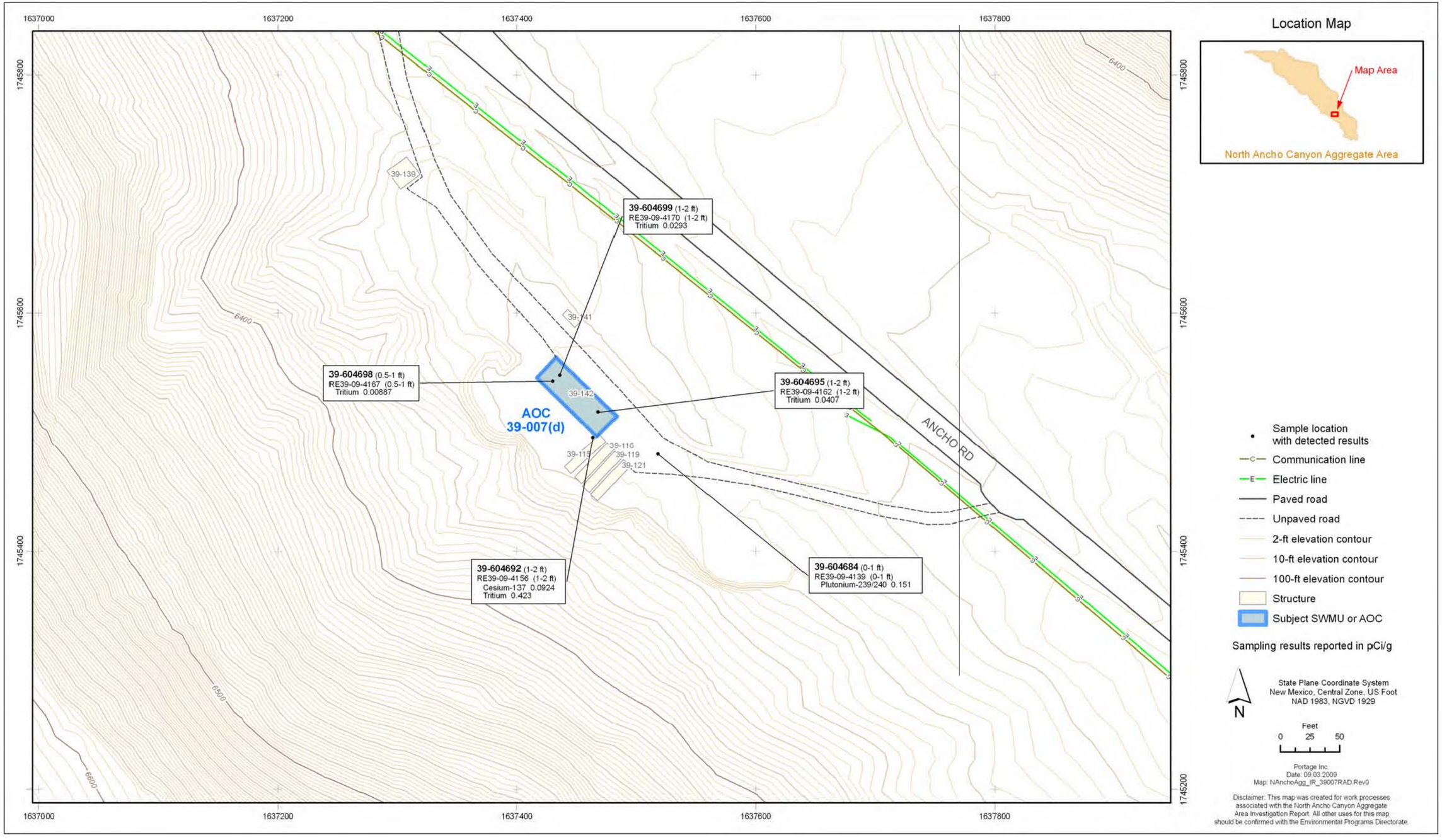

Figure 5.14-4 Radionuclides detected or detected above BVs/FVs at AOC 39-007(d)

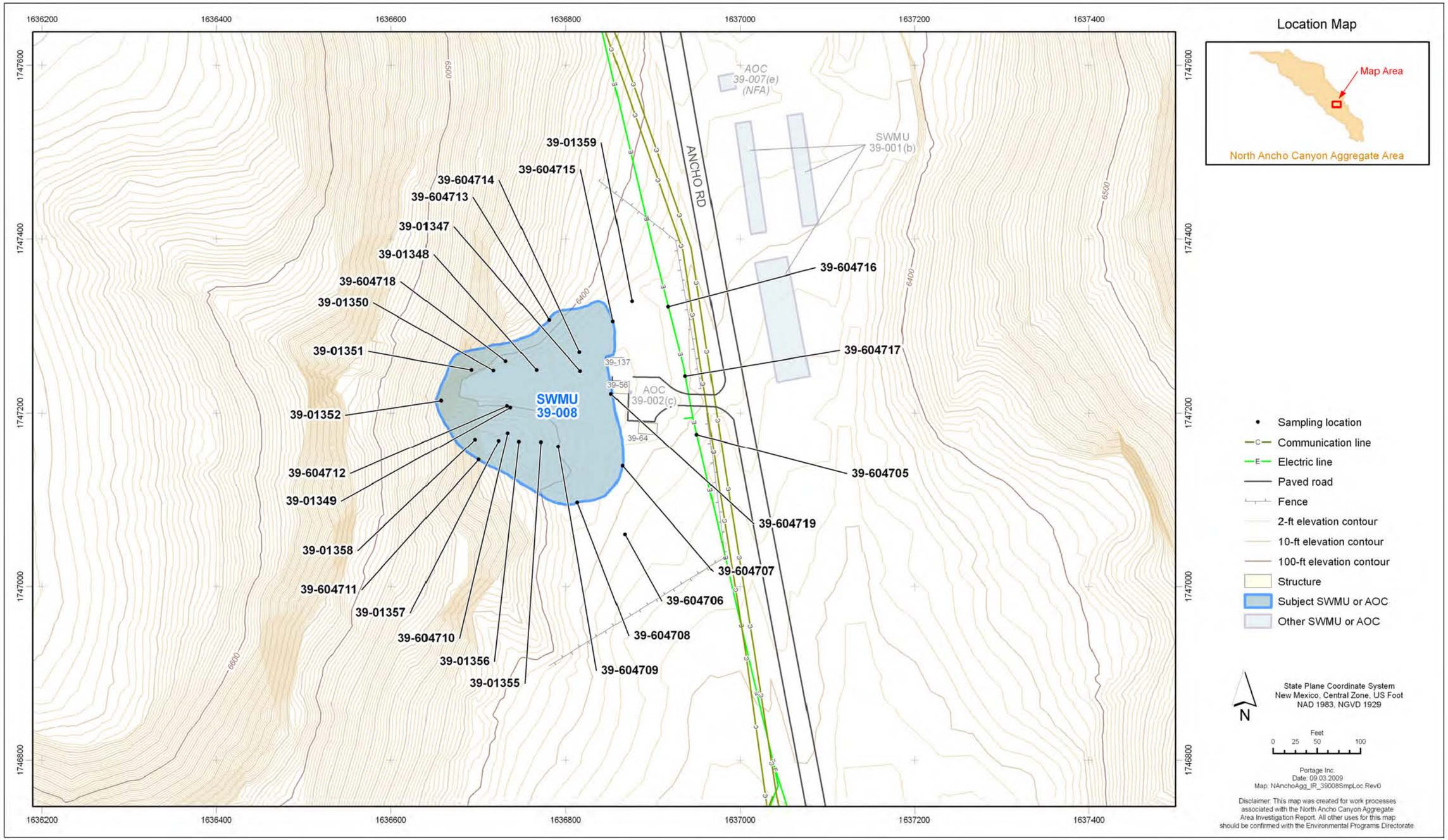

Figure 5.15-1 Locations sampled for SWMU 39-008

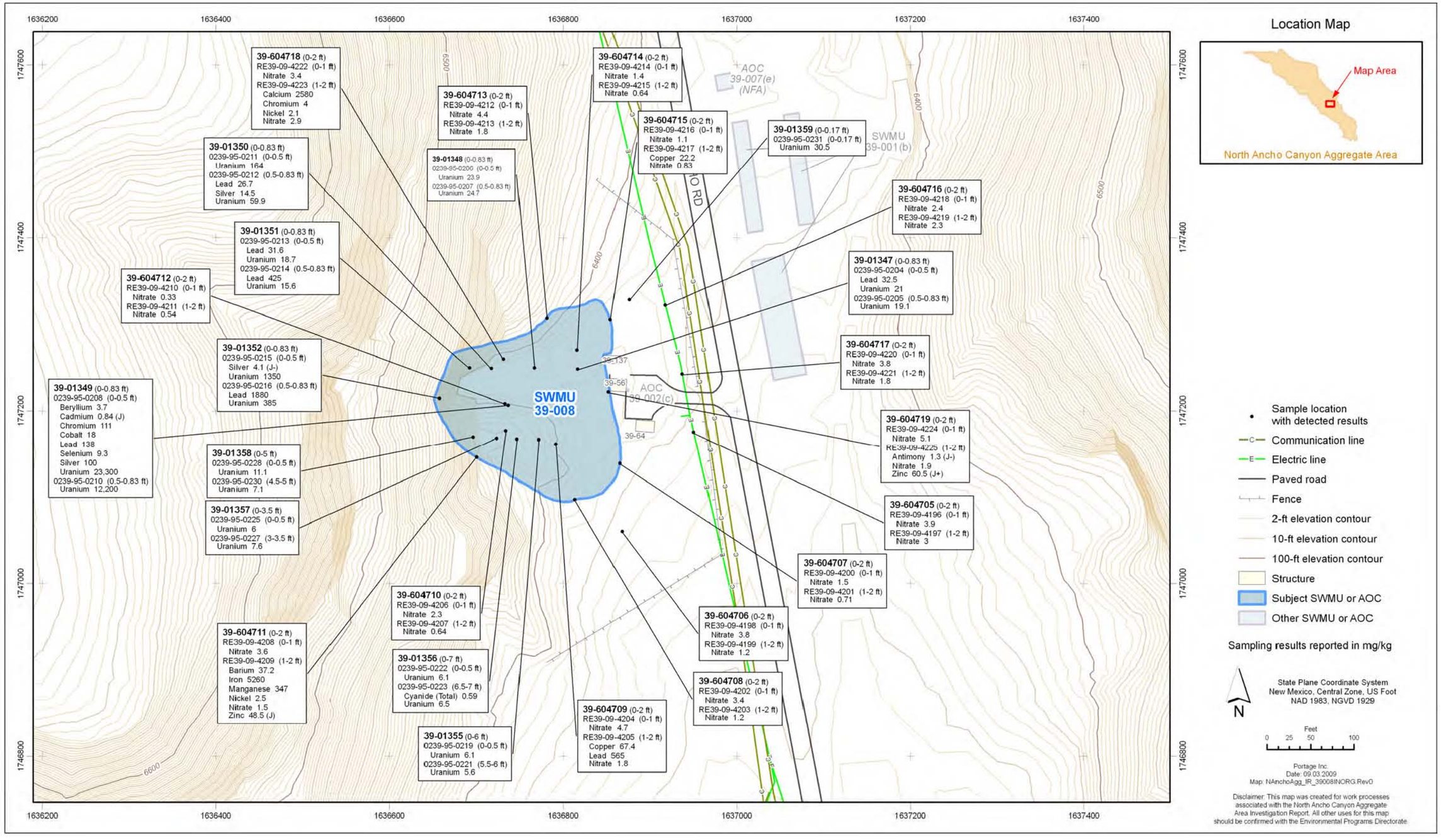

Figure 5.15-2 Inorganic chemicals detected or detected above BVs at SWMU 39-008

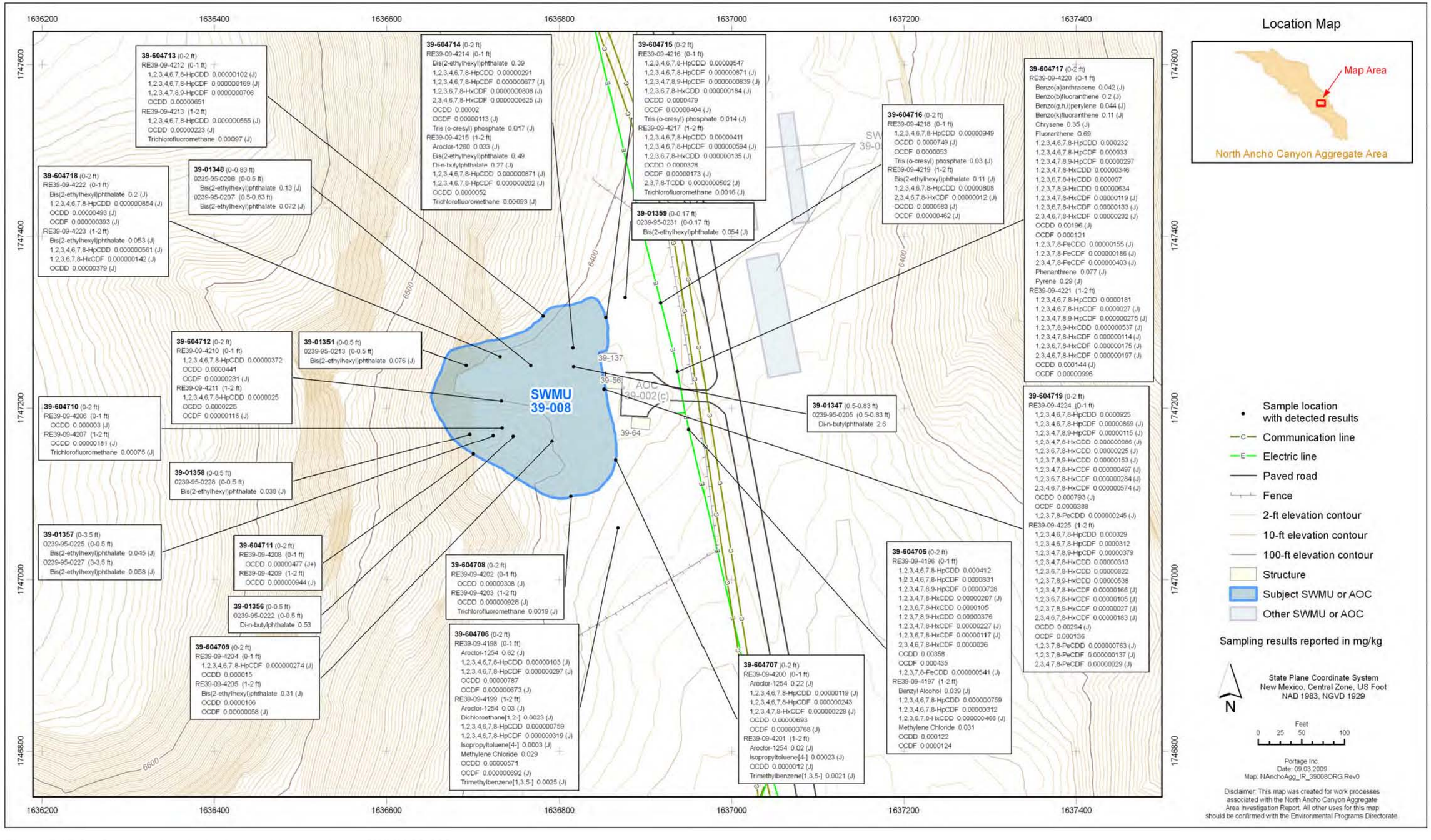

Figure 5.15-3 Organic chemicals detected in samples at SWMU 39-008

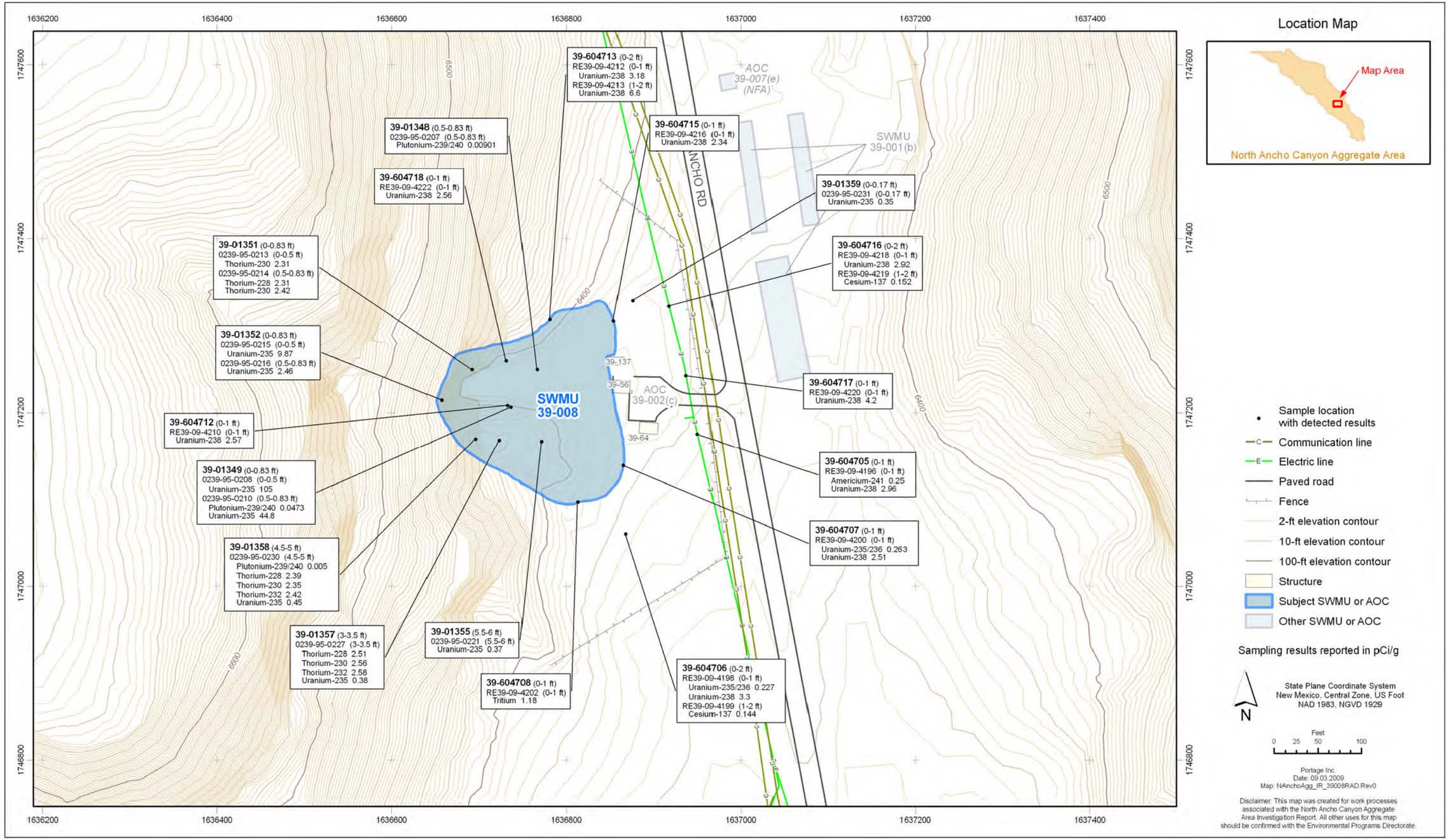

Figure 5.15-4 Radionuclides detected or detected above BVs/FVs at SWMU 39-008

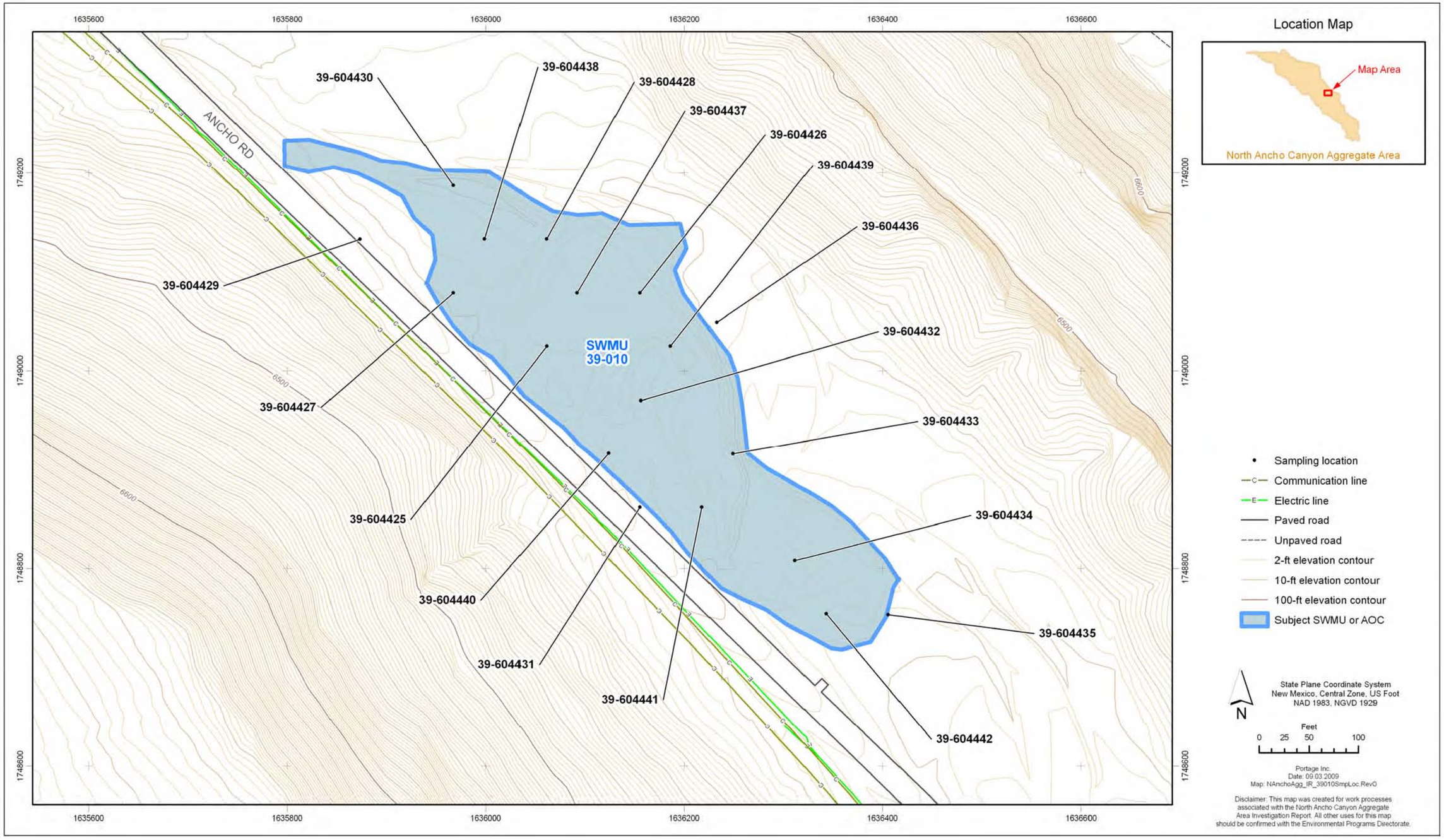

Figure 5.16-1 Locations sampled for SWMU 39-010

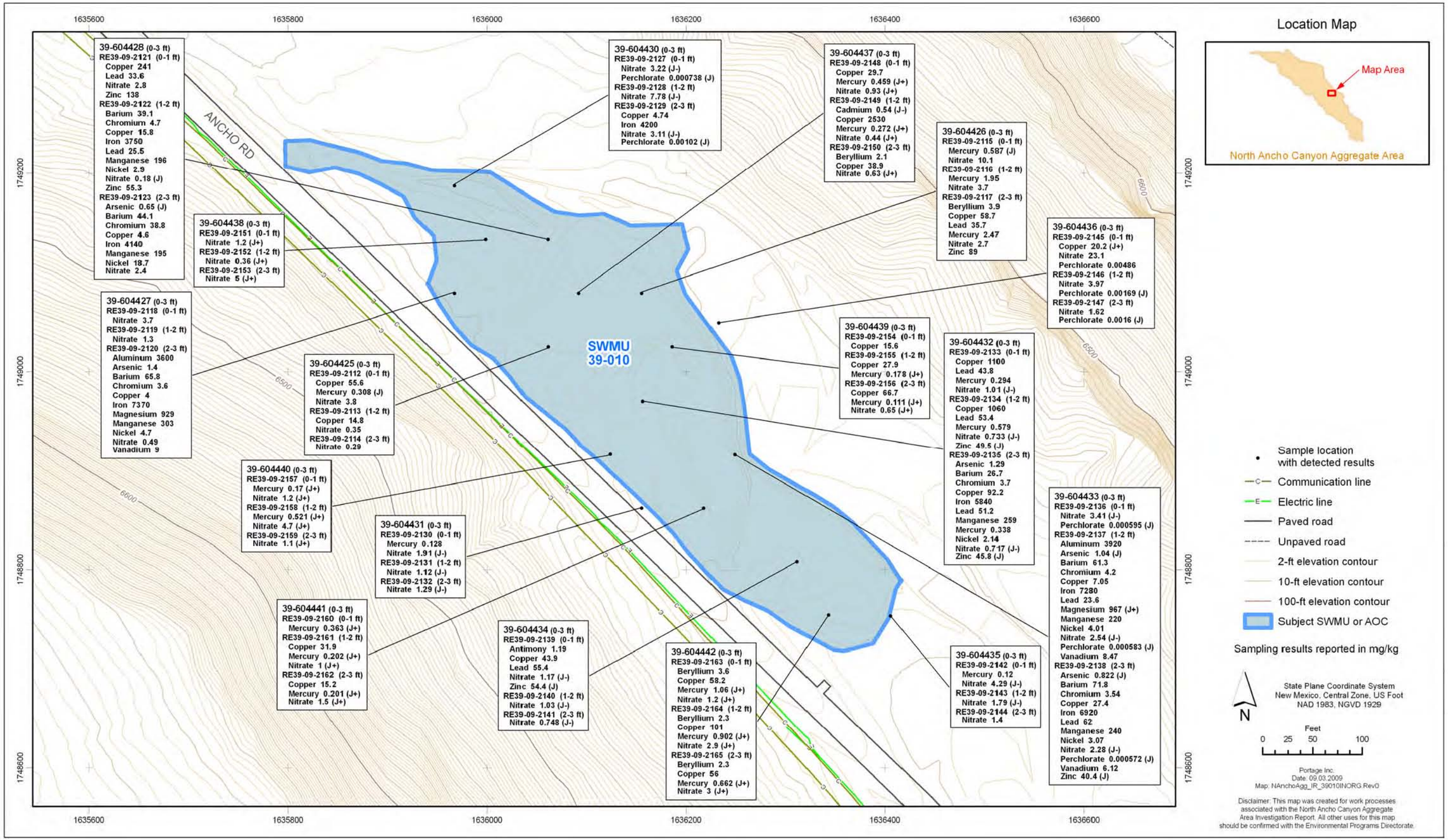

Figure 5.16-2 Inorganic chemicals detected or detected above BVs at SWMU 39-010

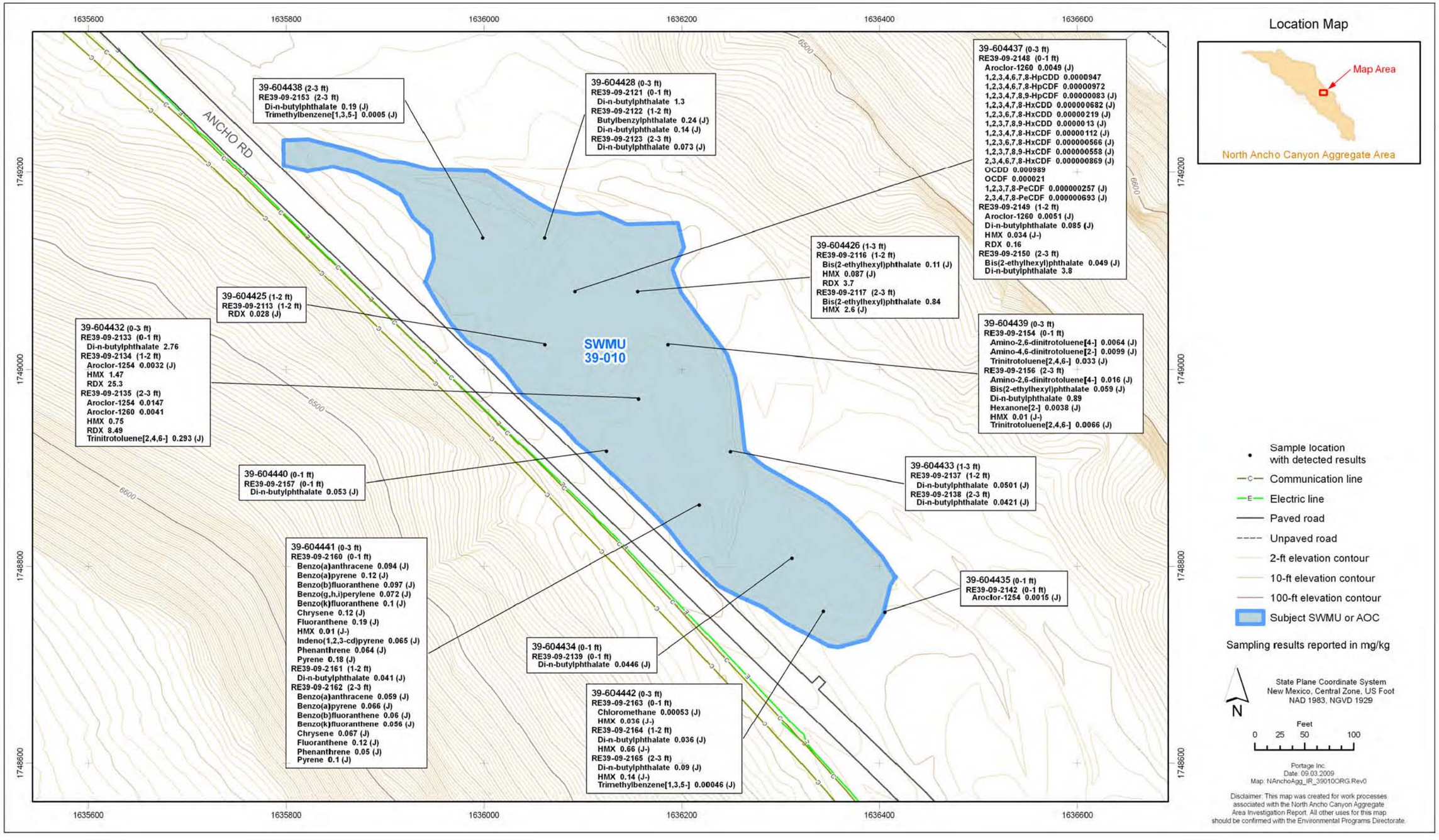

Figure 5.16-3 Organic chemicals detected in samples at SWMU 39-010

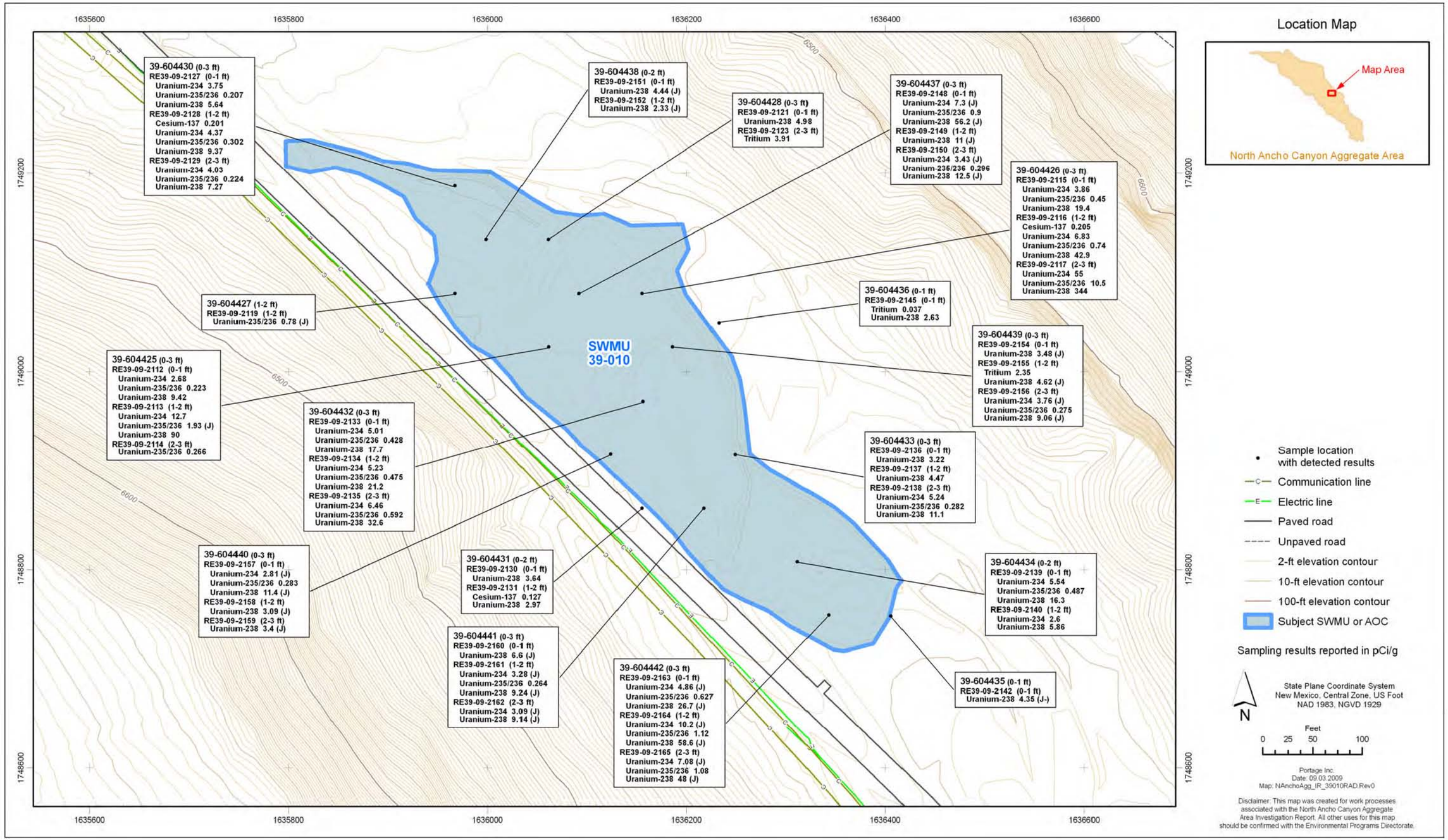

Figure 5.16-4 Radionuclides detected or detected above BVs/FVs at SWMU 39-010

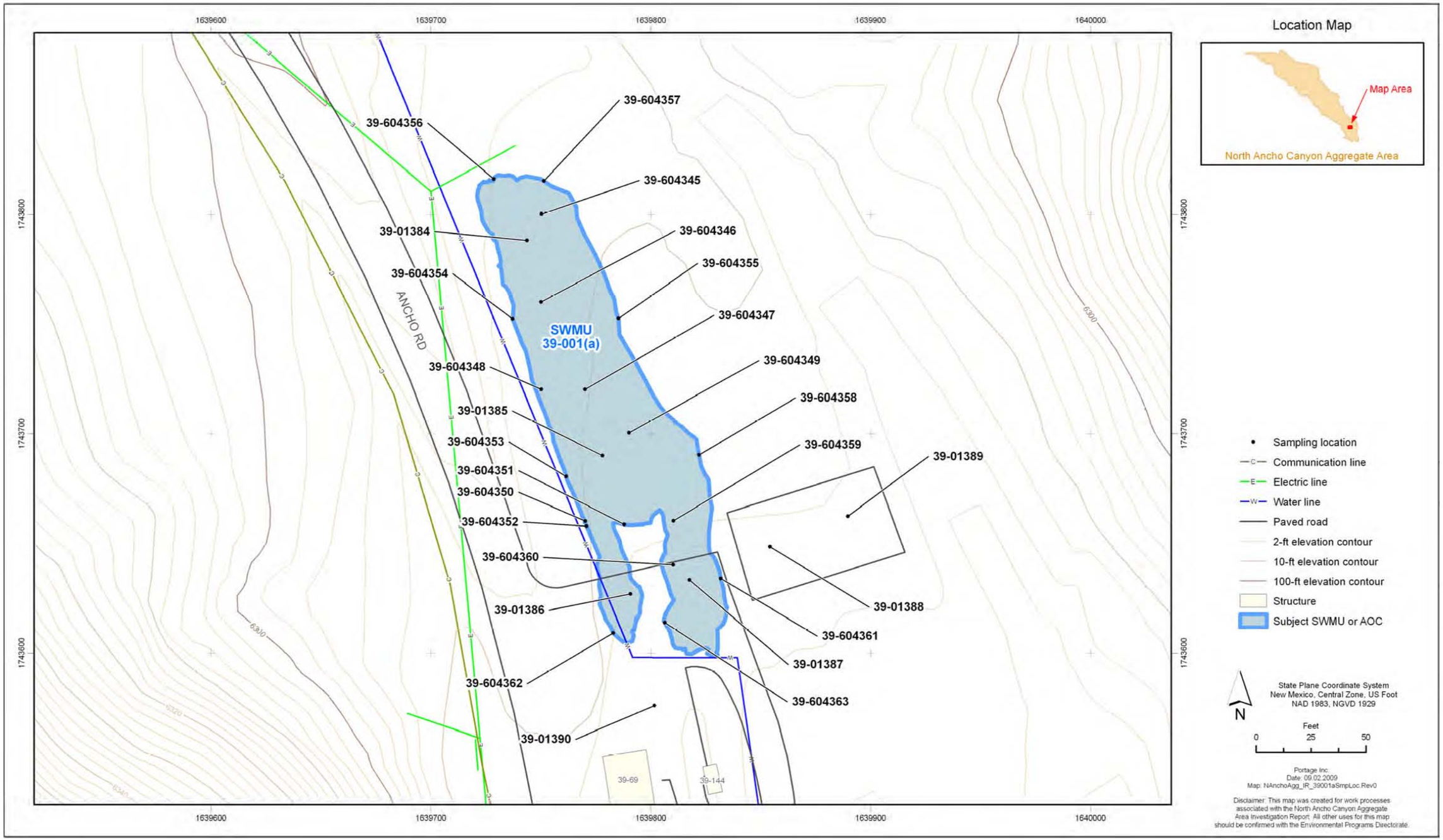

Figure 5.18-1 Locations sampled at SWMU 39-001(a)

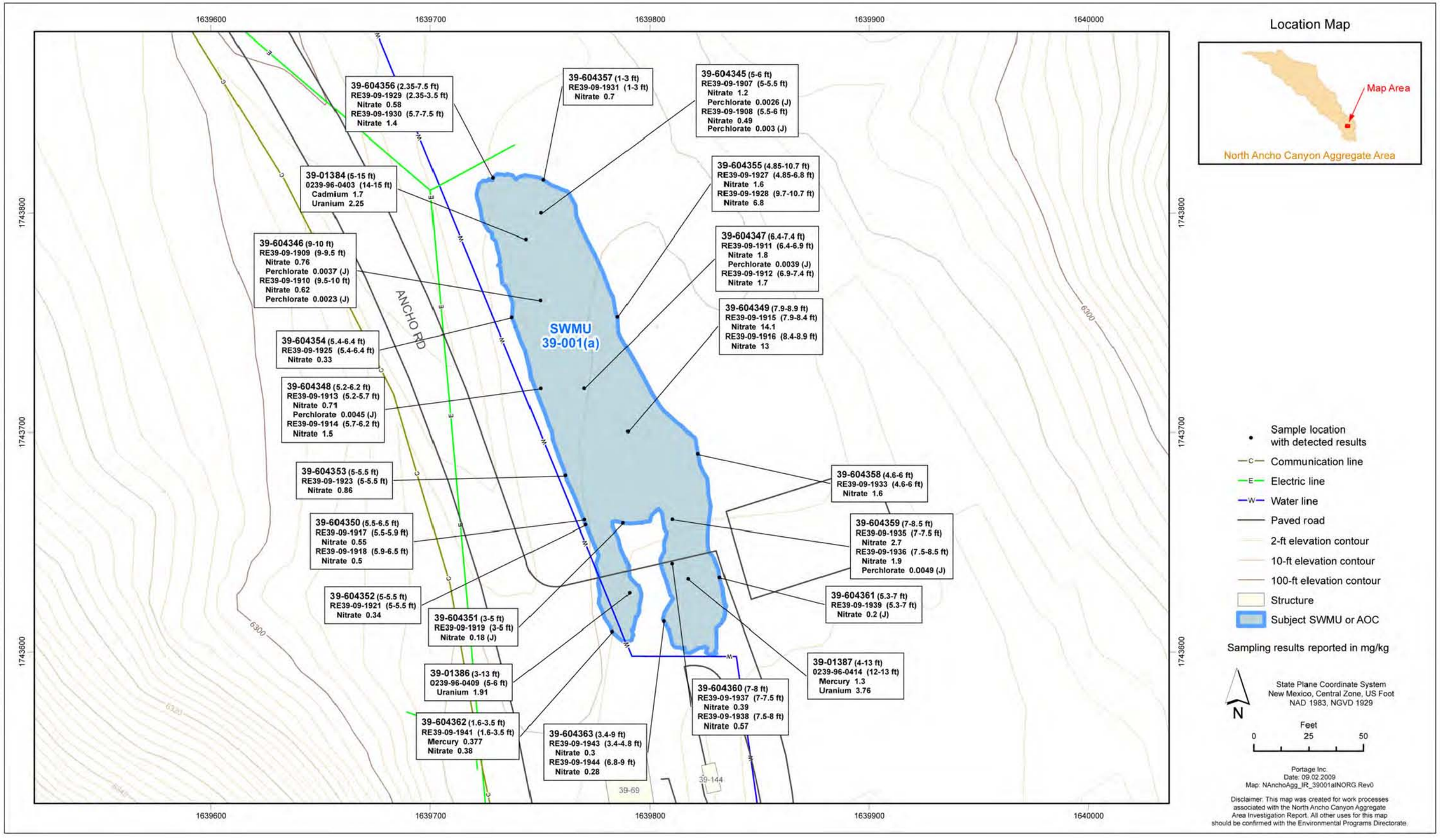

Figure 5.18-2 Inorganic chemicals detected or detected above BVs at SWMU 39-001(a)

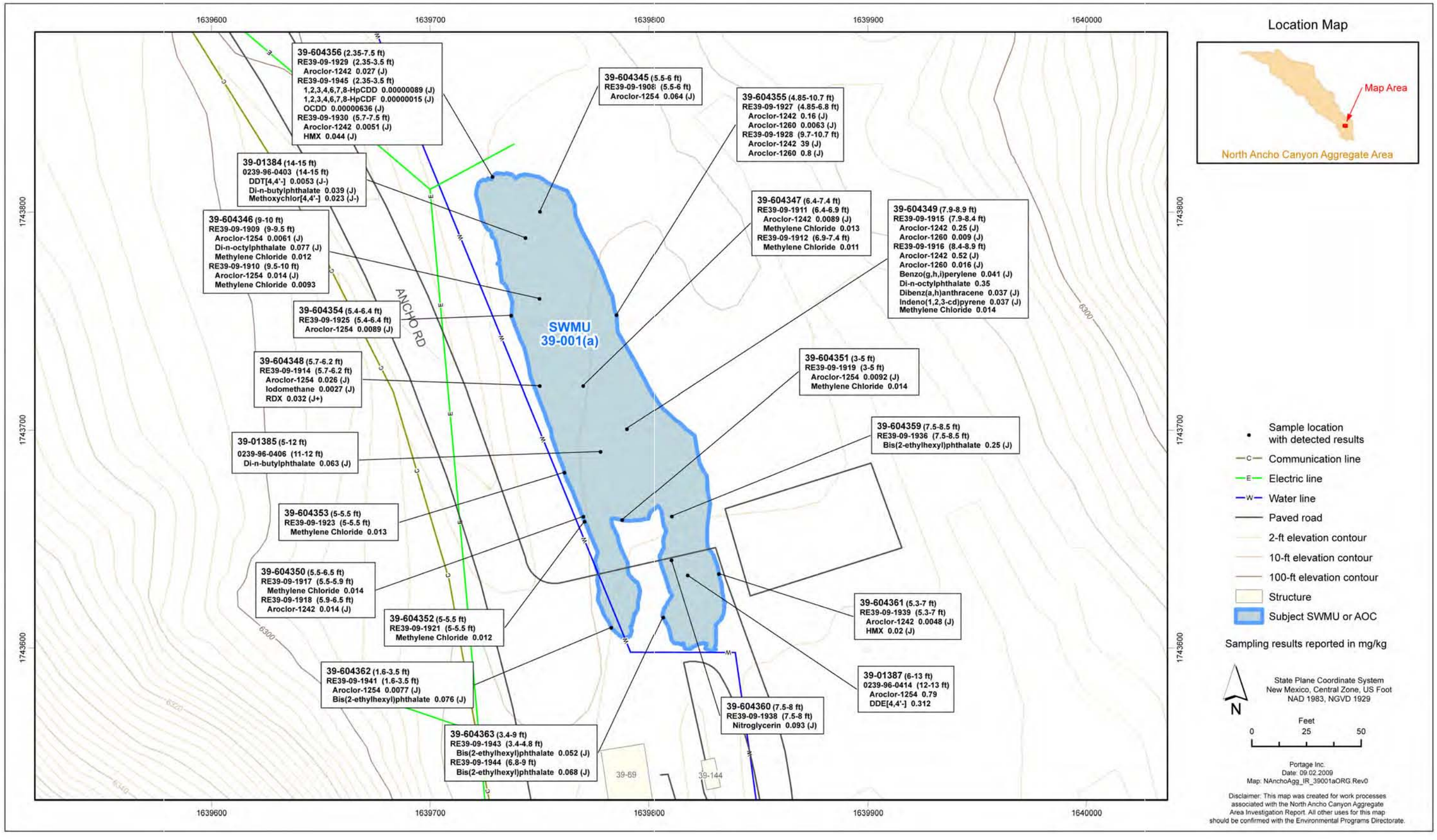

Figure 5.18-3 Organic chemicals detected in samples at SWMU 39-001(a)

Figure 5.18-4 Radionuclides detected or detected above BVs/FVs at SWMU 39-001(a)

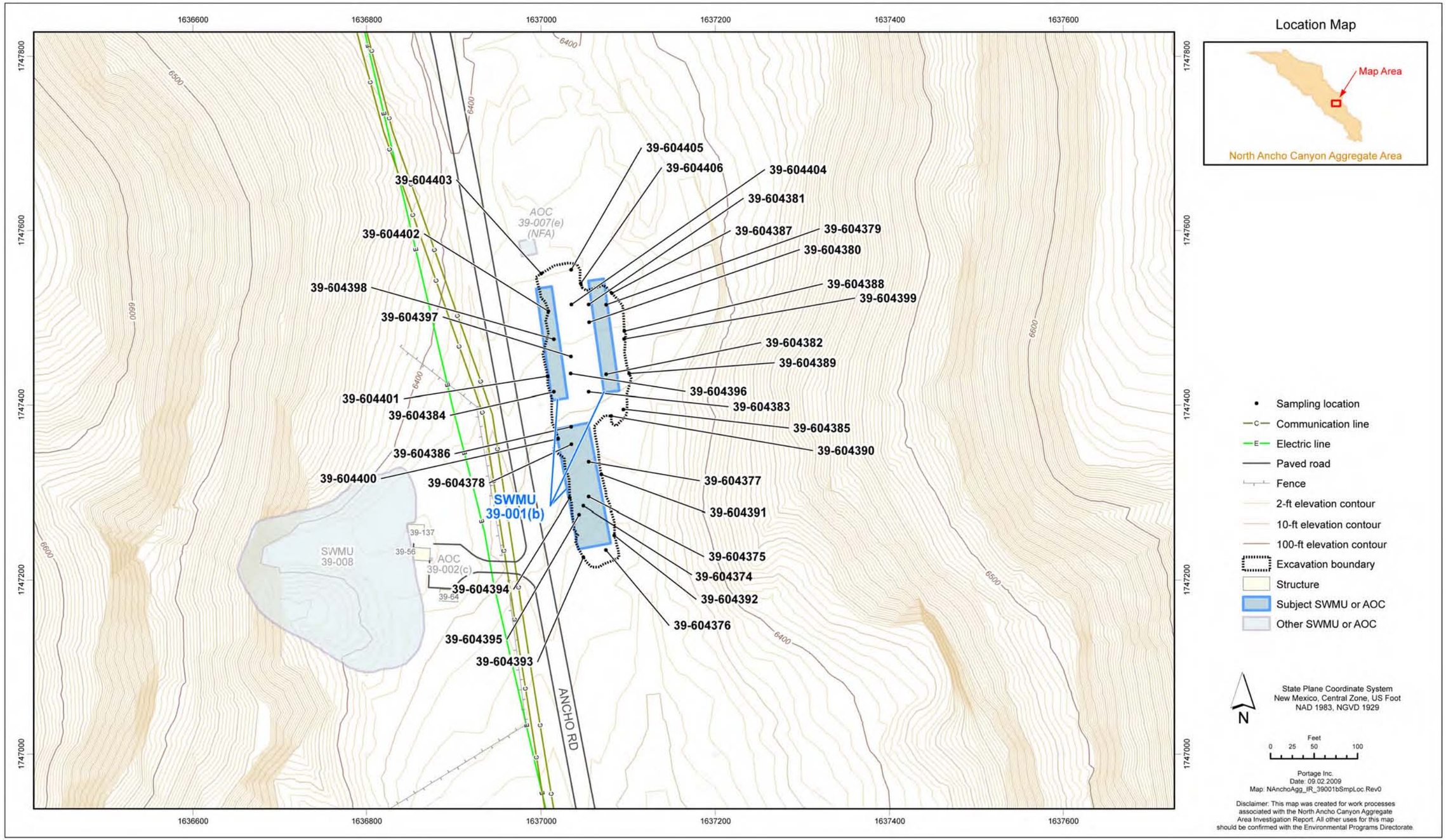

Figure 5.19-1 Locations sampled at SWMU 39-001(b)

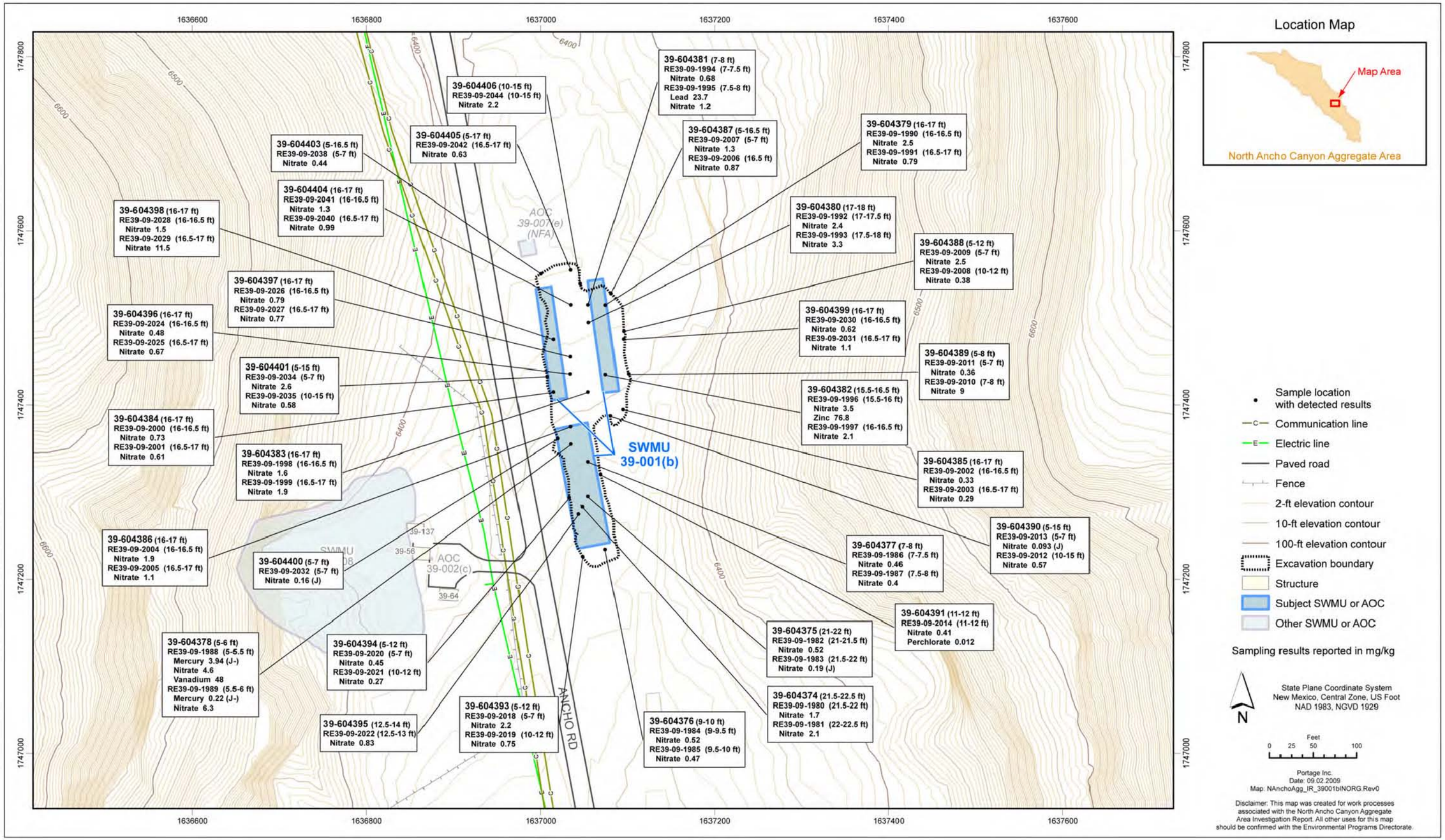

Figure 5.19-2 Inorganic chemicals detected or detected above BVs at SWMU 39-001(b)

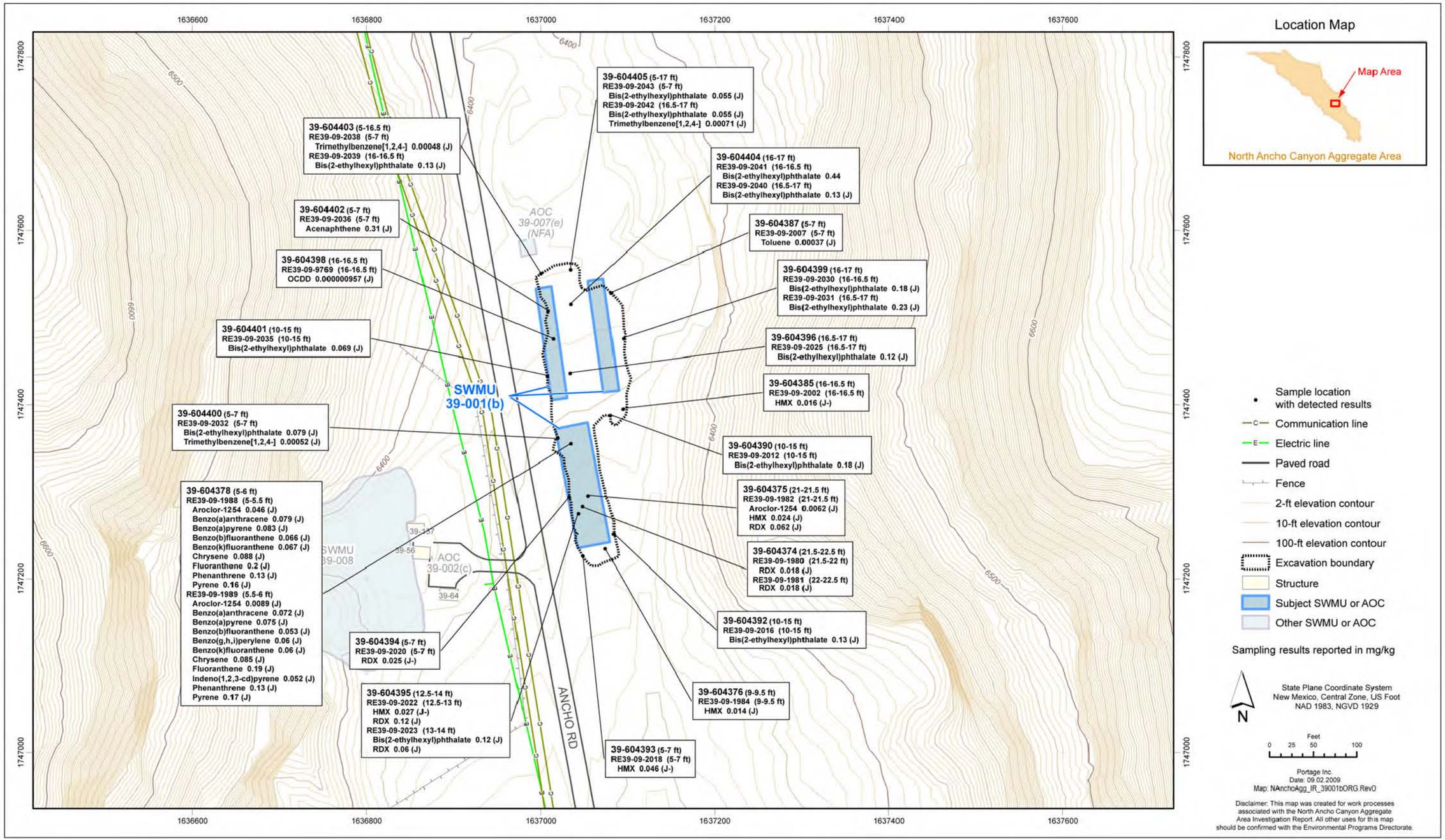

Figure 5.19-3 Organic chemicals detected in samples at SWMU 39-001(b)

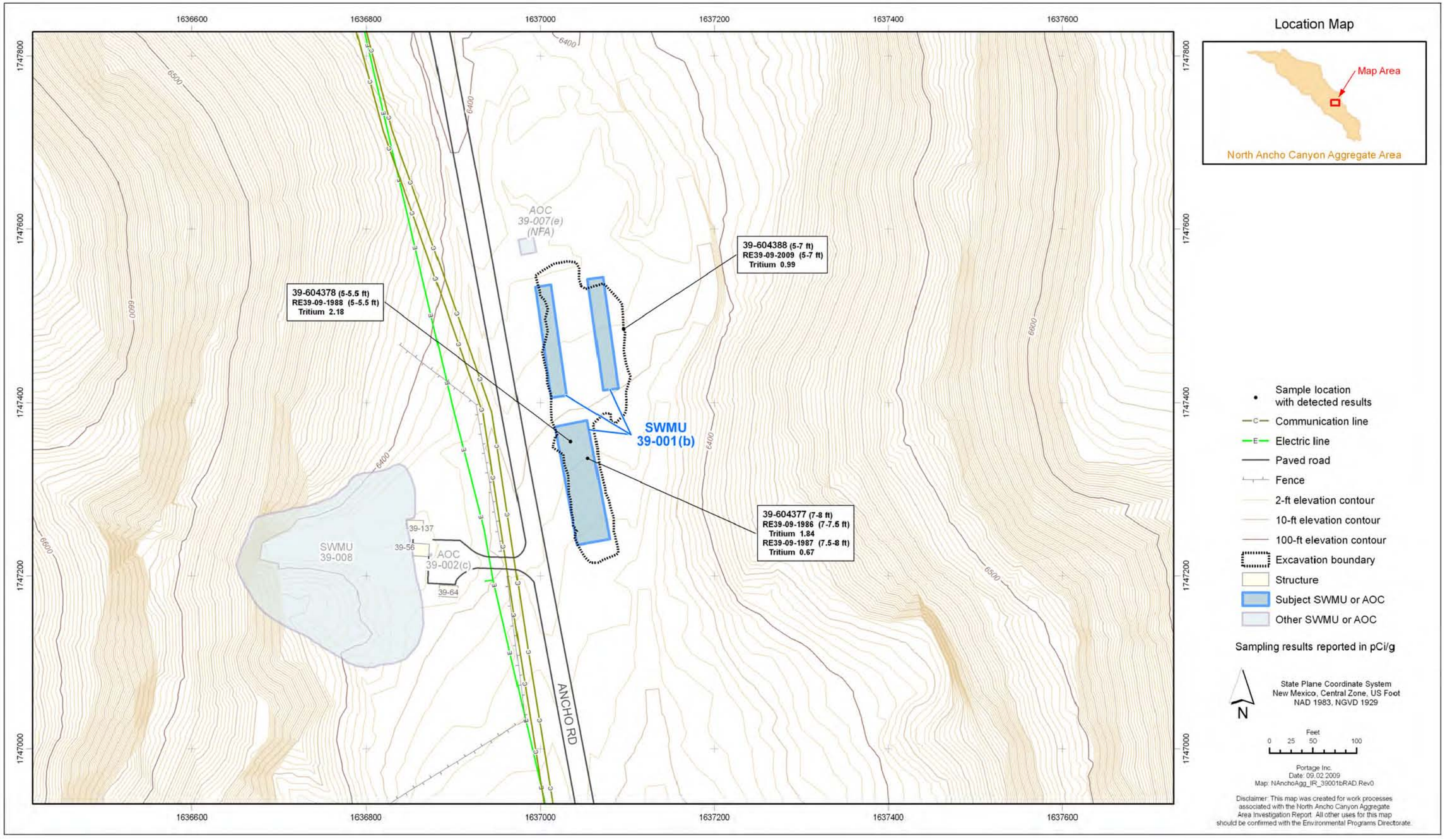

Figure 5.19-4 Radionuclides detected or detected above BVs/FVs at SWMU 39-001(b)

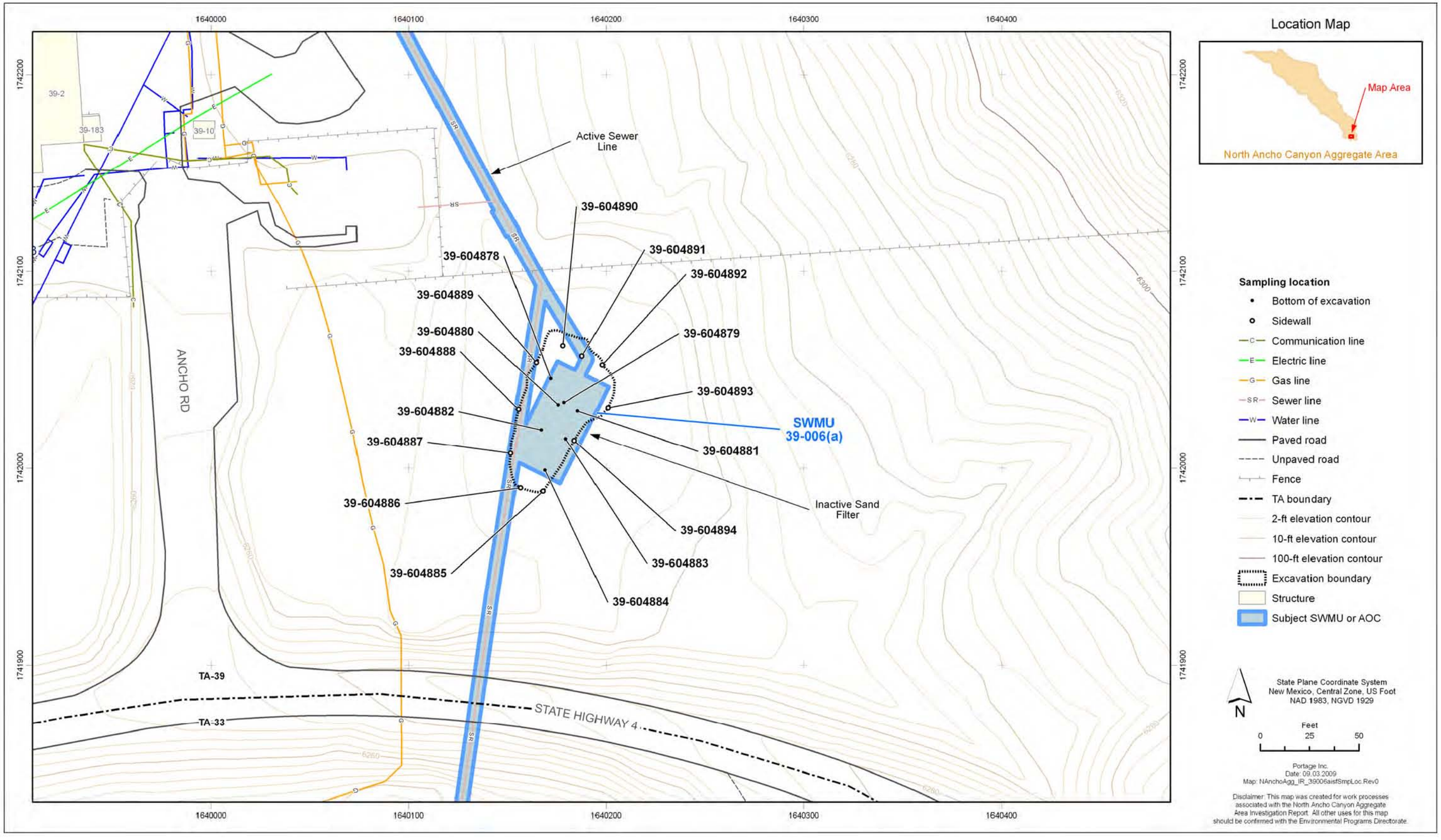

Figure 5.20-1 Locations sampled at SWMU 39-006(a) inactive components sand filter

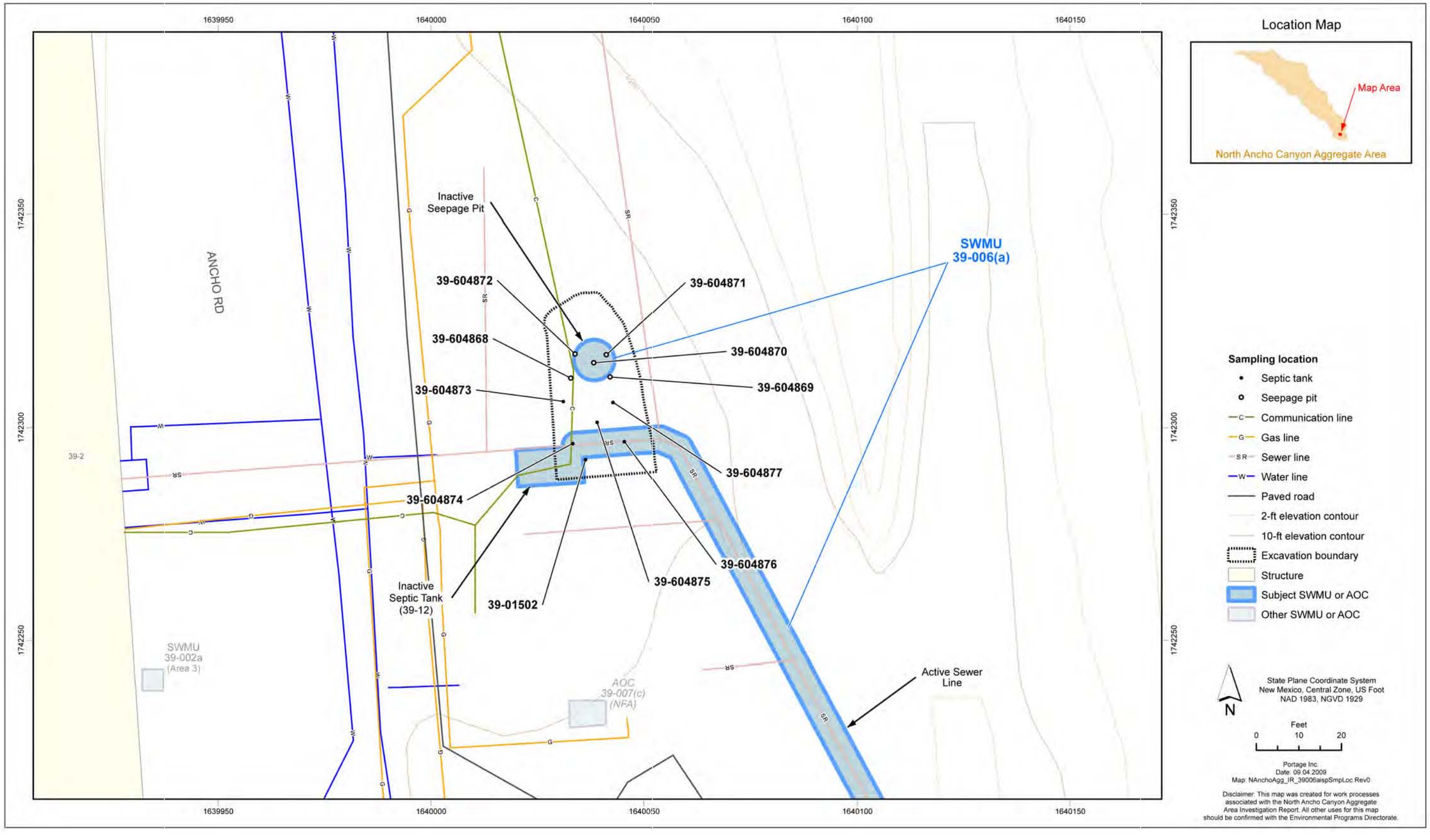

Figure 5.20-2 Locations sampled at SWMU 39-006(a) inactive components seepage pit and septic tank

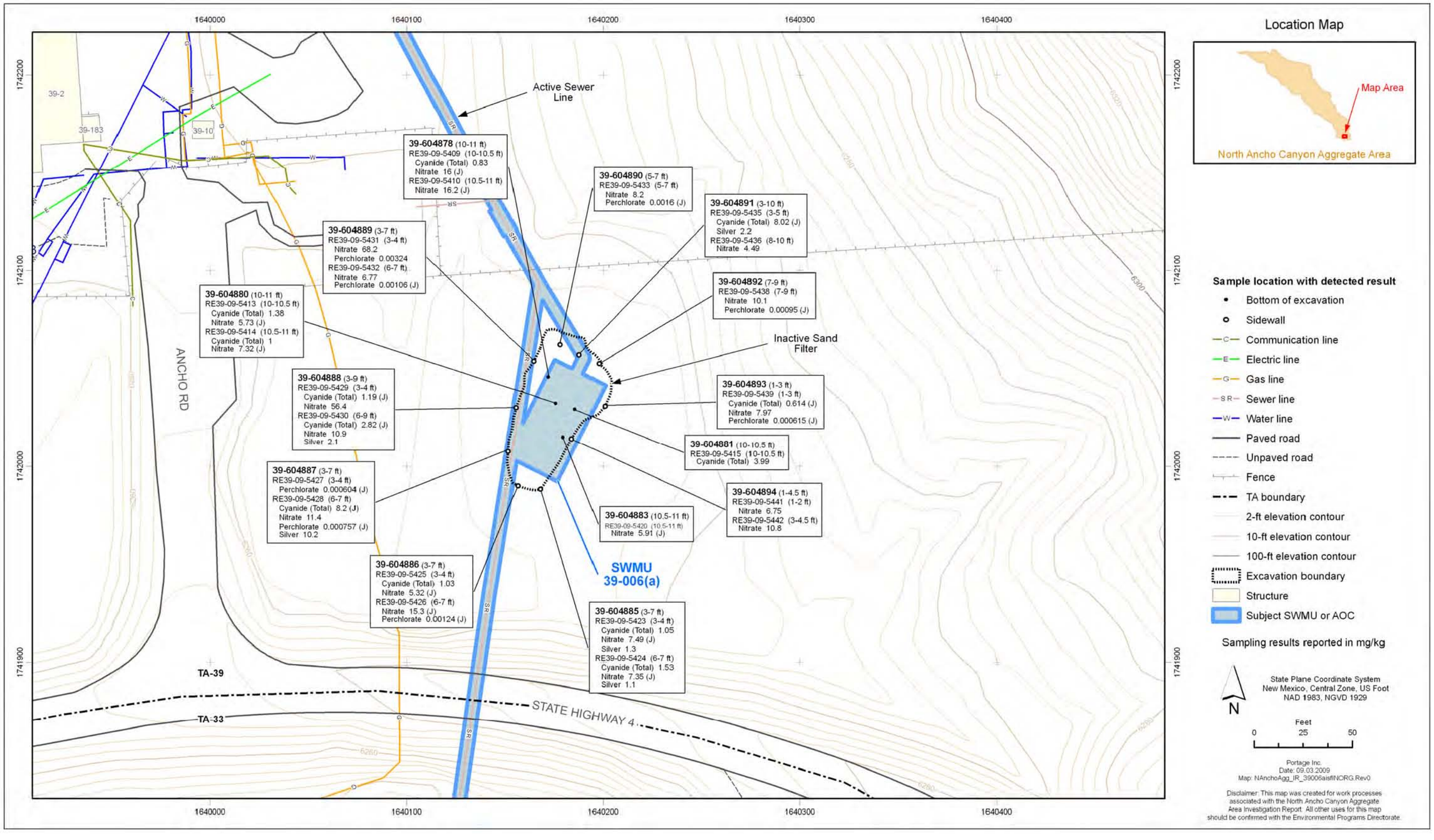

Figure 5.20-3 Inorganic chemicals detected or detected above BVs at SWMU 39-006(a) inactive sand filter

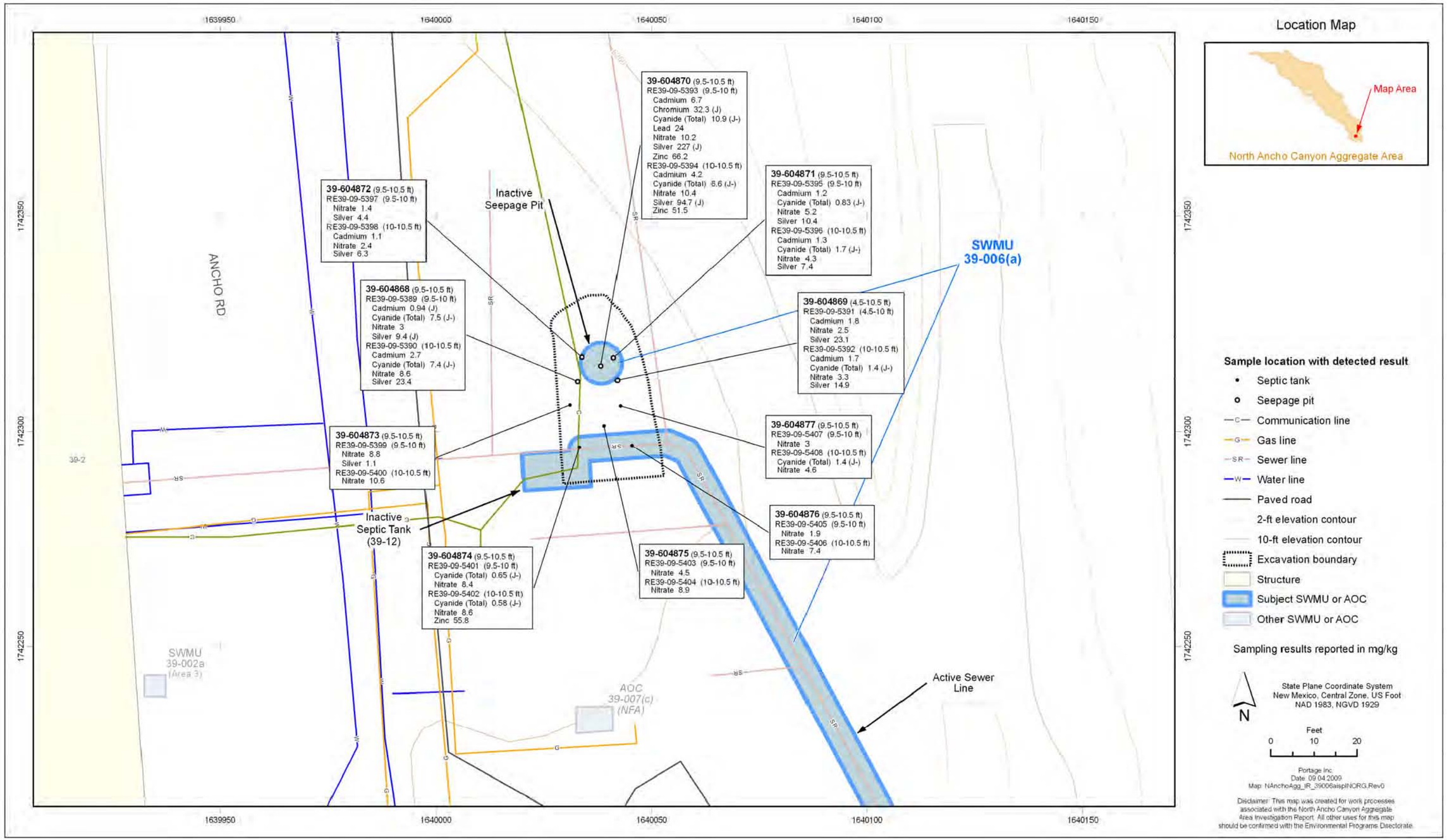

Figure 5.20-4 Inorganic chemicals detected or detected above BVs at SWMU 39-006(a) inactive seepage pit and septic tank

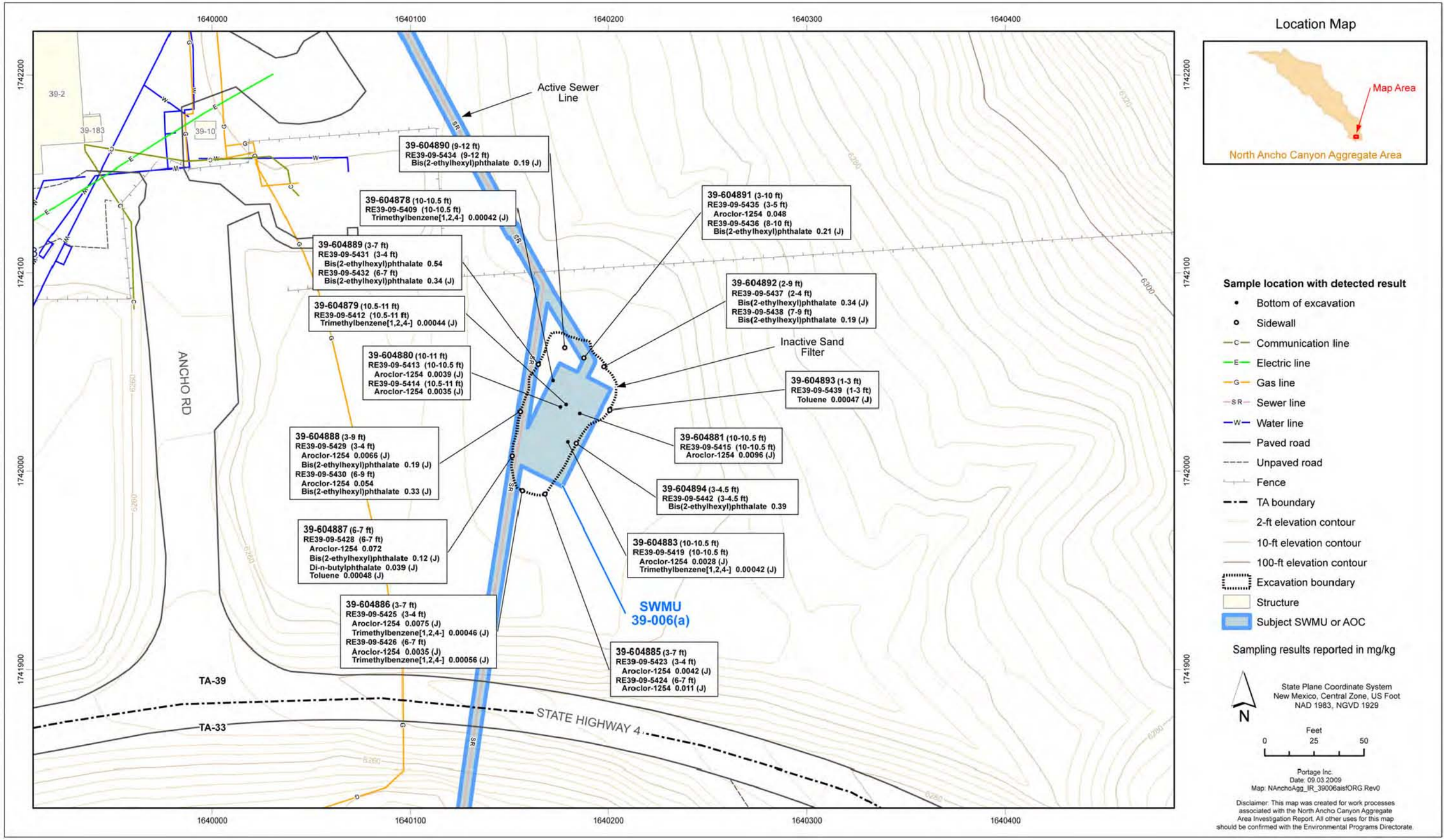

Figure 5.20-5 Organic chemicals detected in samples at SWMU 39-006(a) inactive sand filter

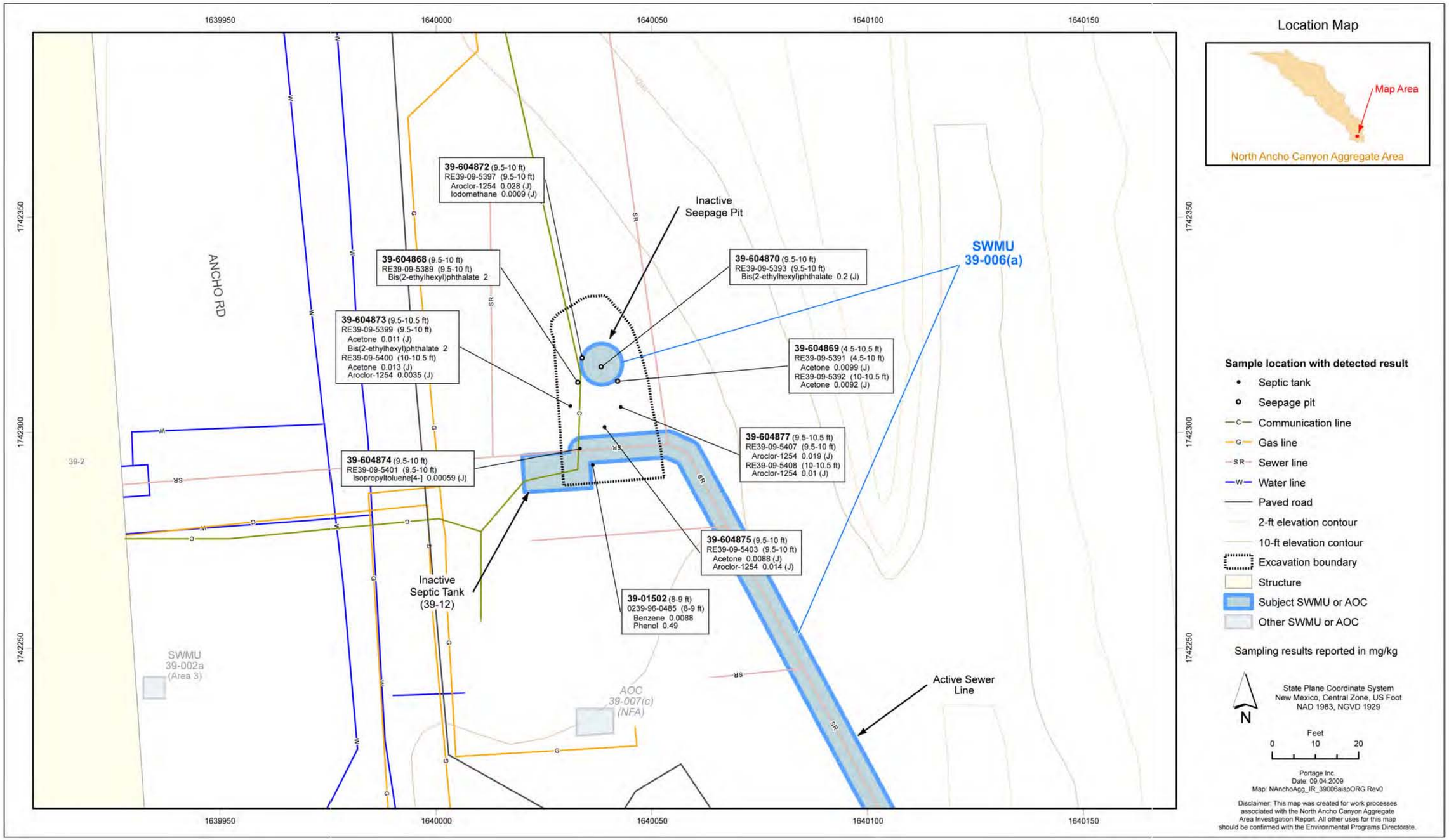

Figure 5.20-6 Organic chemicals detected in samples at SWMU 39-006(a) inactive seepage pit and septic tank

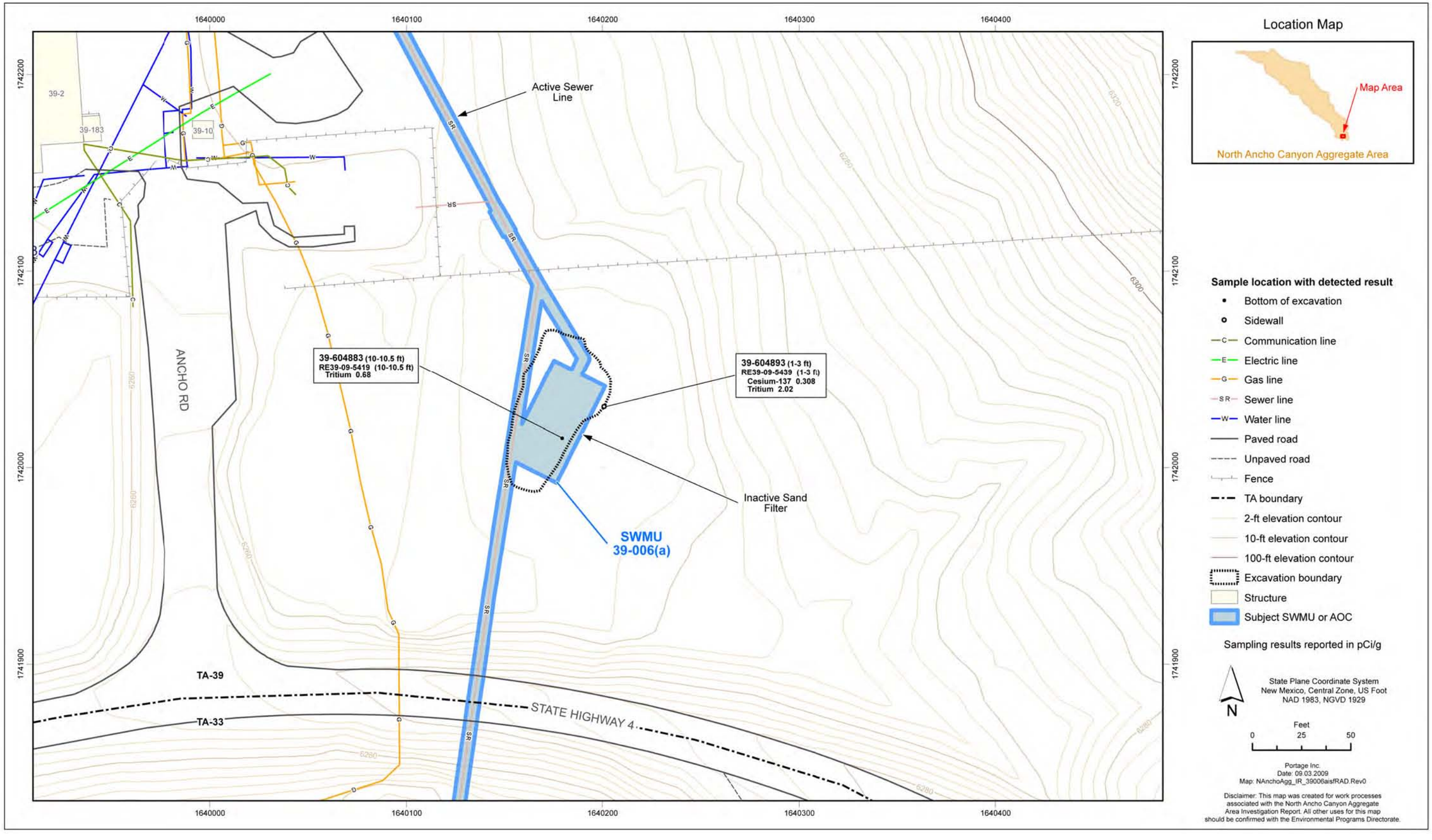

Figure 5.20-7 Radionuclides detected or detected above BVs/FVs at SWMU 39-006(a) inactive sand filter

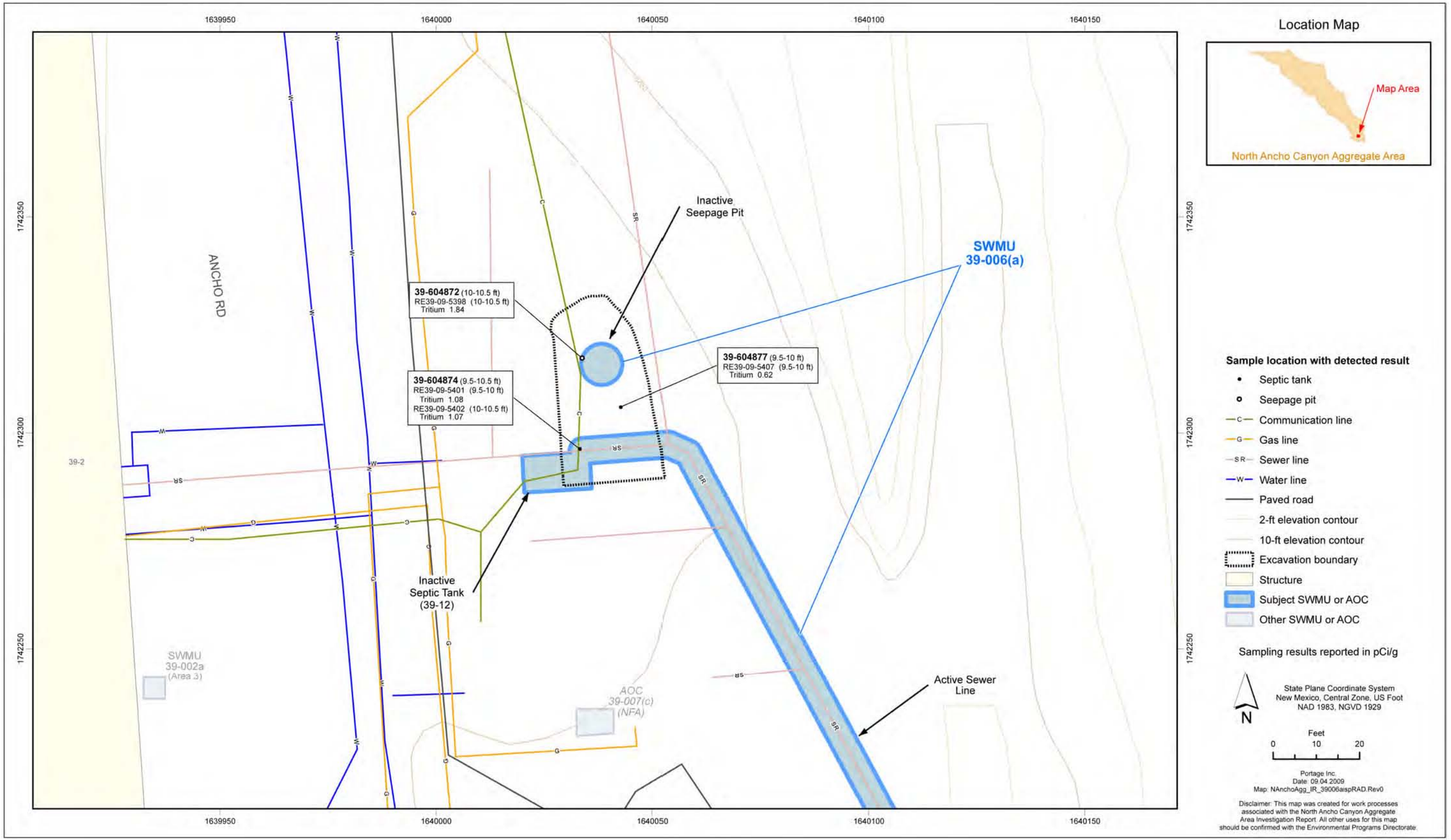

Figure 5.20-8 Radionuclides detected or detected above BVs/FVs at SWMU 39-006(a) inactive seepage pit and septic tank

Table 1.1-1
Status of SWMUs and AOCs in North Ancho Canyon Aggregate Area

Site	Description	Status
Sites Included in this Report		
SWMU 39-001(a)	Disposal area	Investigation in progress
SWMU 39-001(b)	Disposal area	Investigation in progress
SWMU 39-002(a)	Storage Area	Investigation in progress
AOC 39-002(b)	Inactive Storage Area	Investigation in progress
AOC 39-002(c)	Inactive Storage Area	Investigation in progress
AOC39-002(d)	Inactive former satellite accumulation area	Investigation not required, former RCRA-regulated unit
AOC 39-002(e)	Inactive former satellite accumulation area	Investigation not required, former RCRA-regulated unit
AOC 39-002(f)	Storage Area	Investigation in progress
SWMU 39-004(a)	Active firing site;	Investigation deferred per Consent Order Table IV-2
SWMU 39-004(b)	Firing site on standby status	Investigation deferred per Consent Order Table IV-2
SWMU 39-004(c)	Active firing site	Investigation in progress
SWMU 39-004(d)	Active firing site	Investigation in progress
SWMU 39-004(e)	Active firing site	Investigation deferred per Consent Order Table IV-2
SWMU 39-005	HE seepage pit	Investigation in progress
SWMU 39-006(a)	Septic system	Investigation in progress
SWMU 39-007(a)	Former storage area	Investigation in progress
AOC 39-007(d)	Storage area	Investigation in progress
SWMU 39-008	Area of potential soil contamination	Investigation in progress
SWMU 39-010	Excavated soil dump	Investigation in progress
Sites Previously Approved for NFA		
AOC 39-002(g)	Storage area	NFA approved by EPA (2005, 088464)
SWMU 39-003	Incinerator	Removed from Module VIII of Hazardous Waste Facility Permit (HWFP) by NMED (1998, 063042)
SWMU 39-006(b)	Septic system	Removed from Module VIII of HWFP by NMED (1998, 063042)
AOC 39-007(b)	Storage area	NFA approved by EPA (2005, 088464)
AOC 39-007(c)	Storage area	NFA approved by EPA (2005, 088464)
AOC 39-007(e)	Storage area	NFA approved by EPA (2005, 088464)
AOC 39-009	Outfall	NFA approved by EPA (2005, 088464)
AOC 49-007(b)	Septic system	NFA approved by EPA (2005, 088464)
AOC 49-009	Former aboveground tank	NFA approved by EPA (2005, 088464)

Table 1.1-1 (continued)

Site	Description	Status
Sites Included in Other Investigation Work Plans		
SWMU 49-001(a)	MDA AB experimental shafts	Investigation Work Plan for Sites at Technical Area 49 Inside the Nuclear Environmental Site (NES) Boundary (LANL 2008, 102691)
SWMU 49-001(b)	MDA AB experimental shafts	Investigation Work Plan for Sites at Technical Area 49 Inside the NES Boundary (LANL 2008, 102691)
SWMU 49-001(c)	MDA AB experimental shafts	Investigation Work Plan for Sites at Technical Area 49 Inside the NES Boundary (LANL 2008, 102691)
SWMU 49-001(d)	MDA AB experimental shafts	Investigation Work Plan for Sites at Technical Area 49 Inside the NES Boundary (LANL 2008, 102691)
SWMU 49-001(e)	MDA AB experimental shafts	Investigation Work Plan for Sites at Technical Area 49 Inside the NES Boundary (LANL 2008, 102691)
SWMU 49-001(f)	MDA AB experimental shafts	Investigation Work Plan for Sites at Technical Area 49 Inside the NES Boundary (LANL 2008, 102691)
SWMU 49-001(g)	MDA AB surface soil contamination	Investigation Work Plan for Sites at Technical Area 49 Inside the NES Boundary (LANL 2008, 102691)
AOC 49-002	Operational facility (Area 10 underground chamber)	Investigation Work Plan for Sites at Technical Area 49 Outside the NES Boundary (LANL 2008, 102215)
SWMU 49-003	Leach field (Area 11)	Investigation Work Plan for Sites at Technical Area 49 Inside the NES Boundary (LANL 2008, 102691)
SWMU 49-005(a)	Disposal area (east of Area 10)	Investigation Work Plan for Sites at Technical Area 49 Outside the NES Boundary (LANL 2008, 102215)
AOC 49-005(b)	Disposal area (in Area 5)	Investigation Work Plan for Sites at Technical Area 49 Outside the NES Boundary (LANL 2008, 102215)
SWMU 49-006	Sump	Investigation Work Plan for Sites at Technical Area 49 Outside the Nuclear Environmental Site Boundary (LANL 2008, 102215)
AOC 49-008(a)	Soil contamination (Area 5)	Investigation Work Plan for Sites at Technical Area 49 Outside the NES Boundary (LANL 2008, 102215)
AOC 49-008(b)	Soil contamination (Area 6)	Investigation Work Plan for Sites at Technical Area 49 Outside the NES Boundary (LANL 2008, 102215)
AOC 49-008(c)	Soil contamination (Area 11)	Investigation Work Plan for Sites at Technical Area 49 Inside the NES Boundary (LANL 2008, 102691)
AOC 49-008(d)	Bottle house and cable pull test facilities	Investigation Work Plan for Sites at Technical Area 49 Inside the NES Boundary (LANL 2008, 102691)

Table 3.6-1
Results of Comparison of Off-Site Fill to LANL BVs

Chemical	Chemical Name	Soil BV	Units	Fill Composite Sample Result	Fill Exceeds BV?
Al	Aluminum	29200	mg/kg	618	No
Am-241	Americium-241	0.013	pCi/g	-0.00106 (U)	No
Sb	Antimony	0.83	mg/kg	0.417 (U)	No
As	Arsenic	8.17	mg/kg	1.56 (U)	No
Ba	Barium	295	mg/kg	91.5	No
Be	Beryllium	1.83	mg/kg	0.562	No
Cd	Cadmium	0.4	mg/kg	0.52 (U)	Yes[a]
Ca	Calcium	6120	mg/kg	5270	No
Cs-137	Cesium-137	1.65	pCi/g	-0.026 (U)	No
Cl(-1)	Chloride	231	mg/kg	0.697	No
Cr	Chromium	19.3	mg/kg	4.05	No
Co	Cobalt	8.64	mg/kg	1.73	No
Cu	Copper	14.7	mg/kg	4.17	No
Fe	Iron	21500	mg/kg	9320	No
Pb	Lead	22.3	mg/kg	16	No
Mg	Magnesium	4610	mg/kg	1440	No
Mn	Manganese	671	mg/kg	284	No
Hg	Mercury	0.1	mg/kg	0.024	No
Ni	Nickel	15.4	mg/kg	4.42	No
Pu-238	Plutonium-238	0.023	pCi/g	0.00043 (U)	No
Pu-239	Plutonium-239	0.054	pCi/g	0.000256 (U)	No
K	Potassium	3460	mg/kg	814	No
K-40	Potassium-40	36.8	pCi/g	33.5	No
Ra-226	Radium-226	2.59	pCi/g	1.15	No
Ra-228	Radium-228	2.33	pCi/g	1.86	No
Se	Selenium	1.52	mg/kg	NA[b]	No
Ag	Silver	1	mg/kg	0.0993	No
Na	Sodium	915	mg/kg	531	No
Sr-90	Strontium-90	1.31	pCi/g	0.115(U)	No
So4(-2)	Sulfate	293	mg/kg	NA	NA
Tl	Thallium	0.73	mg/kg	0.183	No
Th-228	Thorium-228	2.28	pCi/g	NA	NA
Th-230	Thorium-230	2.29	pCi/g	NA	NA
Th-232	Thorium-232	2.33	pCi/g	NA	NA
H-3	Tritium	0.766	pCi/mL	0.408 (U)	No
U-234	Uranium-234	2.59	pCi/g	1.04	No
U-235	Uranium-235	0.2	pCi/g	0.0427 (U)	No
U-238	Uranium-238	2.29	pCi/g	0.96	No
V	Vanadium	39.6	mg/kg	10.6	No
Zn	Zinc	48.8	mg/kg	37.8	No

Note: Data qualifiers are defined in Appendix A.
[a] Detection limit (analyte not detected) exceeds BV but is below detection limit.
[b] NA = Not analyzed.

Table 4.2-1
Residential, Industrial, and Recreational Screening Levels

ERDB Names	Residential Soil SSL or SAL (mg/kg or pCi/g)	Industrial Soil SSL or SAL (mg/kg or pCi/g)	Recreational Soil SSL or SAL (mg/kg or pCi/g)[a]
Acenaphthene	3.44E+03	3.67E+04	4.75E+04
Acenaphthylene[b]	1.72E+03	1.83E+04	4.75E+04
Acetone	6.75E+04	8.51E+05	4.77E+05
Aluminum	7.81E+04	1.13E+06	7.90E+05
Amino-2,6-dinitrotoluene[4-][c]	1.50E+02	2.00E+03	na[d]
Amino-4,6-dinitrotoluene[2-][c]	1.50E+02	1.90E+03	na
Anthracene	1.72E+04	1.83E+05	2.38E+05
Antimony	3.13E+01	4.54E+02	3.17E+02
Aroclor-1242	1.70E+00	8.26E+00	1.05E+01
Aroclor-1254	1.12E+00	8.26E+00	6.65E+00
Aroclor-1254[c]	2.20E+00	na	1.05E+01
Aroclor-1260	1.70E+00	8.26E+00	1.05E+01
Arsenic	3.59E+00	1.77E+01	2.77E+01
Barium	1.56E+04	2.24E+05	1.00E+05[c]
Benzene	1.55E+01	8.54E+01	2.24E+02
Benzo(a)anthracene	4.81E+00	2.34E+01	3.01E+01
Benzo(a)pyrene	4.81E-01	2.34E+00	3.01E+00
Benzo(b)fluoranthene	4.81E+00	2.34E+01	3.01E+01
Benzo(g,h,i)perylene[b]	1.72E+03	1.83E+04	2.38E+04
Benzo(k)fluoranthene	4.81E+01	2.34E+02	3.01E+02
Benzoic Acid[c]	1.00E+05	2.50E+06	1.59E+06
Beryllium	1.56E+02	2.26E+03	1.58E+03
Bis(2-chloroethyl) ether	2.56E+00	1.36E+01	3.45E+01
Bis(2-ethylhexyl)phthalate	2.80E+02	1.37E+03	1.83E+02
Bromomethane	2.23E+01	8.36E+01	2.28E+02
Butylbenzylphthalate[c]	2.60E+03	9.10E+03	7.97E+04
Cadmium	7.79E+01	1.12E+03	3.92E+02
Chloromethane	3.56E+01	1.98E+02	5.10E+02
Chromium[c]	2.80E+03	1.40E+04	1.43E+03
Chrysene	4.81E+02	2.34E+03	3.01E+03
Cobalt[c]	1.52E+03	2.05E+04	1.57E+04
Copper	3.13E+03	4.54E+04	3.17E+04
Cyanide (Total)	1.56E+03	2.27E+04	7.97E+03
DDE[4,4'-]	1.15E+01	5.63E+01	1.22E+02
DDT[4,4'-]	1.58E+01	7.81E+01	1.22E+02
Dibenz(a,h)anthracene	4.81E-01	2.34E+00	3.01E+00

Table 4.2-1 (continued)

ERDB Names	Residential Soil SSL or SAL (mg/kg or pCi/g)	Industrial Soil SSL or SAL (mg/kg or pCi/g)	Recreational Soil SSL or SAL (mg/kg or pCi/g)
Dibenzofuran[e]	1.45E+02	1.74E+03	1.58E+03
Dichlorobenzene[1,2-][c]	3.01E+03	1.43E+04	2.61E+03
Dichlorobenzene[1,4-]	3.21E+01	1.80E+02	2.36E+03
Dichloroethane[1,2-]	7.74E+00	4.28E+01	1.32E+02
Dimethylphenol[2,4-]	1.22E+03	1.37E+04	7.97E+03
Di-n-butylphthalate	6.11E+03	6.84E+04	3.99E+04
Di-n-octylphthalate	2400	2.74E+04	1.59E+04
Dioxin (2,3,7,8-TCDD)	4.14E-05	2.04E-04	2.77E-04
Diphenylamine[c]	1500	1.5E+04	na
Ethylbenzene	6.96E+01	3.85E+02	4.33E+04
Fluoranthene	2.29E+03	2.44E+04	1.39E+04
Fluorene	2.29E+03	2.44E+04	3.17E+04
Hexanone[2-][f]	3.18E+04	3.69E+05	4.11E+05
HMX	3.06E+03	3.42E+04	1.99E+04
Indeno(1,2,3-cd)pyrene	4.81E+00	2.34E+01	3.01E+01
Iron	5.48E+04	7.95E+05	2.38E+05
Isopropylbenzene	3.21E+03	1.49E+04	2.38E+05
Isopropyltoluene[4-][g]	3.21E+03	1.49E+04	7.80E+03
Lead	4.00E+02	8.00E+02	5.60E+02
Manganese	1.07E+04	1.45E+05	3.69E+04
Mercury	2.30E+01	3.10E+02	2.38E+02
Methoxychlor[4,4'-][c]	3.1E+02	3.1E+03	1.69E+03
Methylene Chloride	1.99E+02	1.09E+03	3.300E+03
Methylnaphthalene[2-][c]	3.1E+02	4.1E+03	3.17E+03
Naphthalene	4.50E+01	2.52E+02	1.58E+04
Nickel	1.56E+03	2.27E+04	1.58E+04
Nitrate	1.25E+05	1.82E+06	1.26E+06
Nitroglycerin	6.11E+00	6.84E+01	1.83E+03
Perchlorate	5.48E+01	7.95E+02	7.92E+01
Phenanthrene	1.83E+03	2.05E+04	1.20E+04
Phenol	1.83E+04	2.05E+05	1.20E+05
Pyrene	1.72E+03	1.83E+04	2.38E+04
RDX	3.56E+01	1.74E+02	2.33E+02
Selenium	3.91E+02	5.68E+03	3.96E+03
Silver	3.91E+02	5.68E+03	3.96E+03
Strontium	4.69E+04	6.81E+05	4.75E+05
Styrene	8.97E+03	5.12E+04	6.43E+04

Table 4.2-1 (continued)

ERDB Names	Residential Soil SSL or SAL (mg/kg or pCi/g)	Industrial Soil SSL or SAL (mg/kg or pCi/g)	Recreational Soil SSL or SAL (mg/kg or pCi/g)
Tetryl[c]	2.44E+02	2.74E+03	na
Thallium	5.16E+00	7.49E+01	5.23E+01
Toluene	5.57E+03	5.79E+04	5.41E+04
Trichloroethene	4.57E+01	2.53E+02	1.51E+01
Trichlorofluoromethane[c]	2.01E+03	6.76E+03	1.73E+04
Trimethylbenzene[1,2,4-]	5.80E+01	2.80E+02	3.96E+04
Trimethylbenzene[1,3,5-]	2.48E+01	2.0E+02	7.62E+02
Trinitrobenzene[1,3,5-][c]	2.20E+03	2.70E+04	1.20E+04
Trinitrotoluene[2,4,6-]	3.59E+01	4.69E+02	1.99E+02
Uranium	2.35E+02	3.41E+03	2.38E+03
Vanadium	3.91E+02	5.68E+03	7.92E+02
Xylene (Total)	1.09E+03	3.61E+03	7.51E+03
Xylene[1,2-]	9.55E+03	3.15E+04	8.29E+03
Xylene[1,3-]	8.29E+03	2.72E+04	7.50E+03
Zinc	2.35E+04	3.41E+05	2.38E+05
Americium-241	3.00E+01	1.80E+02	2.80E+02
Cesium-137	5.6E+00	2.30E+01	2.10E+02
Europium-152	2.9E+00	1.10E+01	1.00E+02
Uranium-234	1.70E+02	1.50E+03	3.20E+03
Uranium-235/236	1.7E+01	8.7E+01	5.20E+02
Uranium-238	8.6E+01	4.30E+01	2.10E+03
Plutonium-239/240	3.3E+01	2.10E+01	3.00E+02
Sodium-22	1.6E+00	6.5 E+00	5.8E+01
Tritium	7.50E+02	4.40E+05	7.50E+02
Thorium-228	2.3E+00	9E+00	7.7E+01
Thorium-230	5E+00	5E+00	5E+00
Thorium-232	5E+00	5E+00	5E+00

[a] Recreational SSLs and SALs from LANL 2007, 094496.

[b] No toxicity information is available ;pyrene was used as surrogate based on structural similarity (NMED 2003, 081172).

[c] Residential and industrial SSL from EPA 2009 (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

[d] na = Not available.

[e] No current value, value from EPA (2007, 099314).

[f] No toxicity information is available ;2-butanone was used as surrogate based on structural similarity (NMED 2003, 081172).

[g] No toxicity information is available ;isopropylbenzene (cumeme) was used as surrogate based on structural similarity (NMED 2003, 081172).

Table 5.3-1
Summary of Samples Collected and Analyses Requested at SWMU 39-002(a) Area 1

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	High Explosives	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	Pesticides /PCBs	SVOCs	Total Petroleum Hydrocarbons	VOCs	Cyanide + pH
0239-97-0013	39-01051	0.0–0.5	Soil	–[a]	–	–	–	–	–	X[b]	–	X	X	–	–	X	X	X	X	–
0239-97-0014	39-01053	0.0–0.5	Soil	–	–	–	–	–	–	X	–	X	X	–	–	X	X	X	X	–
0239-97-0001	39-01491	0.0–0.5	Soil	–	–	–	–	–	–	X	–	X	X	X	–	–	X	X	X	–
0239-97-0010	39-01491	1.0–1.5	Soil	–	–	–	–	–	–	X	–	X	X	X	–	–	X	X	X	–
0239-97-0002	39-01492	0.0–0.5	Soil	–	–	–	–	–	–	X	–	X	X	X	–	–	X	X	X	–
0239-97-0003	39-01493	0.0–0.5	Soil	–	–	–	–	–	–	X	–	X	X	X	–	–	X	X	X	–
0239-97-0004	39-01494	0.0–0.5	Soil	–	–	–	–	–	–	X	–	X	X	X	–	–	X	X	X	–
0239-97-0005	39-01495	0.0–0.5	Soil	–	–	–	–	–	–	X	–	X	X	X	–	–	X	X	X	–
0239-97-0006	39-01496	0.0–0.5	Soil	–	–	–	–	–	–	X	–	X	X	X	–	–	X	X	X	–
0239-97-0011	39-01496	1.0–1.5	Soil	–	–	–	–	–	–	X	–	X	X	X	–	–	X	X	X	–
0239-97-0007	39-01497	0.0–0.5	Soil	–	–	–	–	–	–	X	–	X	X	X	–	–	X	X	X	–
0239-97-0008	39-01498	0.0–0.5	Soil	–	–	–	–	–	–	X	–	X	X	X	–	–	X	X	X	–
0239-97-0012	39-01498	1.0–1.5	Soil	–	–	–	–	–	–	X	–	X	X	X	–	–	X	X	X	–
0239-97-0009	39-01499	0.0–0.5	Soil	–	–	–	–	–	–	X	–	X	X	X	–	–	X	X	X	–
RE39-09-5017	39-604805	0.0–1.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5018	39-604805	1.0–2.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5019	39-604805	2.0–3.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5020	39-604806	0.0–1.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5021	39-604806	1.0–2.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5022	39-604806	2.0–3.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5023	39-604807	0.0–1.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5024	39-604807	1.0–2.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X

Table 5.3-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	High Explosives	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	Pesticides /PCBs	SVOCs	Total Petroleum Hydrocarbons	VOCs	Cyanide + pH
RE39-09-5025	39-604807	2.0–3.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5026	39-604808	0.0–1.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5027	39-604808	1.0–2.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5028	39-604808	2.0–3.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5096	39-604808	2.0–3.0	Soil	–	–	X	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-5029	39-604809	0.0–1.5	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5030	39-604809	1.5–2.5	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5031	39-604809	2.0–3.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5032	39-604810	0.0–1.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5033	39-604810	1.0–2.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5034	39-604810	2.0–3.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5035	39-604811	0.0–1.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5036	39-604811	1.0–2.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5037	39-604811	2.0–3.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5038	39-604812	0.0–1.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5039	39-604812	1.0–2.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5040	39-604812	2.0–3.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5041	39-604813	0.0–1.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5042	39-604813	1.0–2.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5044	39-604814	0.0–1.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5045	39-604814	1.0–2.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5046	39-604814	2.0–3.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5047	39-604815	0.0–1.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X

Table 5.3-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	High Explosives	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	Pesticides /PCBs	SVOCs	Total Petroleum Hydrocarbons	VOCs	Cyanide + pH
RE39-09-5048	39-604815	1.0–2.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5049	39-604815	2.0–3.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5050	39-604816	0.0–1.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5051	39-604816	1.0–2.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5052	39-604816	2.0–3.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5053	39-604817	0.0–1.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5054	39-604817	1.0–2.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X
RE39-09-5055	39-604817	2.0–3.0	Soil	X	X	–	X	X	X	–	X	X	X	X	X	–	X	–	X	X

[a] – = Analysis not requested.

[b] X = Analysis was performed.

Table 5.3-2
Summary of Inorganic Chemicals above BVs at SWMU 39-002(a) Area 1

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Copper	Cyanide (Total)	Lead	Mercury	Nickel	Nitrate	Perchlorate	Silver	Thallium	Zinc
Soil Background Value				**0.83**	**0.4**	**14.7**	**0.5**	**22.3**	**0.1**	**15.4**	**na**[a]	**na**	**1**	**0.73**	**48.8**
0239-97-0013	39-01051	0.0–0.5	Soil	–[b]	0.62 (J)	214 (J+)	NA[c]	50 (J+)	1.3 (J+)	–	NA	NA	–	0.78 (U)	59.3 (J+)
0239-97-0014	39-01053	0.0–0.5	Soil	–	1 (J)	186 (J+)	NA	96.9 (J+)	2.5 (J+)	39.8	NA	NA	–	0.87 (J)	110 (J+)
0239-97-0001	39-01491	0.0–0.5	Soil	5.2 (U)	0.52 (U)	16.8	NA	34.7	0.12	–	NA	NA	–	–	–
0239-97-0010	39-01491	1.0–1.5	Soil	6.1 (U)	0.61 (U)	–	NA	–	–	–	NA	NA	–	–	–
0239-97-0002	39-01492	0.0–0.5	Soil	5.2 (U)	0.52 (U)	128	NA	29.2	–	–	NA	NA	–	–	98
0239-97-0003	39-01493	0.0–0.5	Soil	4.9 (U)	0.76	78.7	NA	41	–	–	NA	NA	–	–	77.4
0239-97-0004	39-01494	0.0–0.5	Soil	5.1 (U)	0.51 (U)	28.2	NA	38.9	0.25	–	NA	NA	–	–	–
0239-97-0005	39-01495	0.0–0.5	Soil	5.2 (U)	0.52 (U)	–	NA	24.2	0.13	–	NA	NA	–	–	–
0239-97-0006	39-01496	0.0–0.5	Soil	5.1 (U)	0.84	61.3	NA	35	0.16	–	NA	NA	1.1	–	52.4
0239-97-0011	39-01496	1.0–1.5	Soil	5.8 (U)	0.58 (U)	–	NA	–	1.1	–	NA	NA	–	–	–
0239-97-0007	39-01497	0.0–0.5	Soil	5.5 (U)	0.55 (U)	–	NA	–	–	–	NA	NA	–	–	416
0239-97-0008	39-01498	0.0–0.5	Soil	5.3 (U)	0.53 (U)	28.6	NA	34.8	0.18	–	NA	NA	–	–	49
0239-97-0012	39-01498	1.0–1.5	Soil	5.9 (U)	0.59 (U)	–	NA	–	–	–	NA	NA	–	–	–
0239-97-0009	39-01499	0.0–0.5	Soil	5.2 (U)	1.7	508	NA	141	1.9	–	NA	NA	–	–	191
RE39-09-5017	39-604805	0.0–1.0	Soil	–	–	–	–	–	0.125	–	1.1	–	–	–	61.6
RE39-09-5018	39-604805	1.0–2.0	Soil	–	–	–	–	–	–	–	0.71	–	–	–	–
RE39-09-5019	39-604805	2.0–3.0	Soil	–	–	–	–	–	–	–	0.1 (J)	–	–	–	–
RE39-09-5020	39-604806	0.0–1.0	Soil	–	2.3	47.1	–	160	–	–	10.2	–	–	–	110
RE39-09-5021	39-604806	1.0–2.0	Soil	–	0.85	18	–	977	–	–	4.4	–	1.2 (U)	–	170
RE39-09-5022	39-604806	2.0–3.0	Soil	–	–	–	–	29.1	–	–	6.7	–	–	–	–
RE39-09-5024	39-604807	1.0–2.0	Soil	–	–	–	–	–	–	–	0.37	–	–	–	–
RE39-09-5025	39-604807	2.0–3.0	Soil	–	–	–	–	–	–	–	0.78	–	–	–	–
RE39-09-5026	39-604808	0.0–1.0	Soil	–	–	–	–	–	0.138	–	1.3	–	–	–	–
RE39-09-5027	39-604808	1.0–2.0	Soil	–	–	–	–	–	–	–	2.5	–	–	–	–
RE39-09-5028	39-604808	2.0–3.0	Soil	–	–	–	–	–	–	–	0.5	–	–	–	–
RE39-09-5029	39-604809	0.0–1.5	Soil	–	–	–	–	–	–	–	0.99	–	–	–	–
RE39-09-5030	39-604809	1.5–2.5	Soil	–	–	–	–	–	–	–	0.5	–	–	–	–
RE39-09-5031	39-604809	2.0–3.0	Soil	–	–	–	–	–	–	–	0.23	–	–	–	–
RE39-09-5032	39-604810	0.0–1.0	Soil	1.11 (U)	–	21.9 (J)	–	22.6 (J)	0.422	–	2.06	–	–	–	71.4
RE39-09-5033	39-604810	1.0–2.0	Soil	1.16 (U)	0.579 (U)	–	–	–	–	–	2.45	–	–	–	–
RE39-09-5034	39-604810	2.0–3.0	Soil	1.07 (U)	0.534 (U)	–	–	–	–	–	1.5	–	–	–	–
RE39-09-5035	39-604811	0.0–1.0	Soil	1.14 (U)	–	16.7 (J)	–	–	0.101	–	4.38	–	–	–	141
RE39-09-5036	39-604811	1.0–2.0	Soil	1.13 (U)	0.566 (U)	–	–	–	–	–	7.28	–	–	–	–
RE39-09-5037	39-604811	2.0–3.0	Soil	1.18 (U)	0.591 (U)	–	–	–	–	–	10 (J)	–	–	–	76.1

Table 5.3-2 (continued)

7Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Copper	Cyanide (Total)	Lead	Mercury	Nickel	Nitrate	Perchlorate	Silver	Thallium	Zinc
Soil Background Value				**0.83**	**0.4**	**14.7**	**0.5**	**22.3**	**0.1**	**15.4**	**na**[a]	**na**	**1**	**0.73**	**48.8**
RE39-09-5038	39-604812	0.0–1.0	Soil	2.46	1.04	122 (J)	1	233 (J)	1.85	–	1.03 (J)	–	–	1.26 (J)	113
RE39-09-5039	39-604812	1.0–2.0	Soil	1.12 (U)	–	27.5 (J)	–	–	1.22	–	1.21	–	–	–	60.6
RE39-09-5040	39-604812	2.0–3.0	Soil	1.1 (U)	–	23.7 (J)	–	24 (J)	0.602	–	1.52	–	–	–	55
RE39-09-5041	39-604813	0.0–1.0	Soil	1.11 (U)	0.604	76.1 (J)	–	43.7 (J)	0.836	–	6.58	–	–	–	297
RE39-09-5042	39-604813	1.0–2.0	Soil	1.12 (U)	0.46 (J)	37.2 (J)	–	27.6 (J)	0.846	–	4.55	–	–	–	467
RE39-09-5044	39-604814	0.0–1.0	Soil	1.07 (U)	0.429 (J)	48.1 (J)	20.8	24.1 (J)	0.109	–	–	–	–	–	94.6
RE39-09-5045	39-604814	1.0–2.0	Soil	1.16 (U)	0.582 (U)	–	20.8	–	0.188	–	–	0.000715 (J)	–	–	–
RE39-09-5046	39-604814	2.0–3.0	Soil	1.09 (U)	0.547 (U)	–	4.85	–	–	–	1.18	–	–	–	–
RE39-09-5047	39-604815	0.0–1.0	Soil	–	0.53	41.3	–	23.7	0.183	–	–	–	–	–	70.9
RE39-09-5048	39-604815	1.0–2.0	Soil	–	0.68	46.6	–	30.9	–	–	–	–	–	–	62.8
RE39-09-5049	39-604815	2.0–3.0	Soil	–	0.62	57.2	–	39.8	0.131	–	–	–	–	–	58.7
RE39-09-5053	39-604817	0.0–1.0	Soil	–	0.67	27.5	–	63.2	0.568	–	–	–	–	–	75.8
RE39-09-5054	39-604817	1.0–2.0	Soil	–	–	–	–	26.8	0.244	–	–	–	–	–	–
RE39-09-5055	39-604817	2.0–3.0	Soil	–	–	–	–	–	0.135	–	–	–	–	–	–

Source: BVs from LANL (1998, 059730).
Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.
[a] na = Not available.
[b] – = If analyzed, sample result is less than the BV.
[c] NA = Not analyzed.

Table 5.3-3
Summary of Organic Chemicals Detected at SWMU 39-002(a) Area 1

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Amino-2,6-dinitrotoluene[4-]	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	Dibenzofuran	Dichlorobenzene[1,2-]	Ethylbenzene	Fluoranthene
0239-97-0013	39-01051	0.0–0.5	Soil	–[a]	–	–	–	0.057	–	0.88	0.99	0.86	0.45	0.96	–	1.1	–	–	–	–	–	2.2
0239-97-0014	39-01053	0.0–0.5	Soil	0.5	–	0.171	1	0.18	–	2.3	2.7	2.4	0.95	2.3	–	2.4	1.3	0.38	–	–	–	6.5
0239-97-0001	39-01491	0.0–0.5	Soil	–	–	–	–	0.21	–	1.3	1.6	1.2	1.5	1.3	–	1.6	–	–	–	–	–	3.4
0239-97-0010	39-01491	1.0–1.5	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
0239-97-0002	39-01492	0.0–0.5	Soil	–	–	–	–	0.16	–	0.73	0.84	0.6	0.72	0.73	–	0.93	–	–	–	–	–	2.1
0239-97-0003	39-01493	0.0–0.5	Soil	–	–	–	0.35	0.16	–	0.97	1	0.82	0.53	0.87	–	1.2	–	–	–	–	–	2.1
0239-97-0004	39-01494	0.0–0.5	Soil	–	–	–	–	0.26	–	1.3	1.5	1.2	0.84	1.4	–	1.5	–	–	–	–	–	3.4
0239-97-0005	39-01495	0.0–0.5	Soil	0.43	–	–	0.81	0.1	–	–	3.6	3.6	1.8	3	–	3.1	0.64	–	–	–	–	8.4
0239-97-0006	39-01496	0.0–0.5	Soil	0.34 (J)	–	–	–	0.24	–	–	1.5 (J)	1.5 (J)	0.67 (J)	1.5 (J)	–	1.6 (J)	–	–	–	–	–	3.7 (J)
0239-97-0011	39-01496	1.0–1.5	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
0239-97-0007	39-01497	0.0–0.5	Soil	1.8 (J)	–	–	3.1 (J)	0.14	–	5.5 (J)	6.4 (J)	4.9 (J)	4 (J)	5.2 (J)	–	5.6 (J)	–	–	1.1 (J)	–	–	21 (J)
0239-97-0008	39-01498	0.0–0.5	Soil	–	–	–	0.82 (J)	0.1	–	2 (J)	2.1 (J)	1.9 (J)	1 (J)	2.1 (J)	–	2.2 (J)	2.8 (J)	–	–	–	–	4.8 (J)
0239-97-0009	39-01499	0.0–0.5	Soil	0.7 (J)	–	–	1.4 (J)	0.38	–	2.9 (J)	3.3 (J)	3.3 (J)	0.67 (J)	3.4 (J)	0.74 (J)	3.3 (J)	4.4 (J)	–	0.41 (J)	–	–	8.8 (J)
RE39-09-5017	39-604805	0.0–1.0	Soil	0.048 (J)	–	–	0.074 (J)	0.035 (J)	–	0.35 (J)	0.41	0.33 (J)	0.23 (J)	0.44	–	0.45	–	–	–	–	–	0.87
RE39-09-5018	39-604805	1.0–2.0	Soil	–	–	–	–	0.019 (J)	–	0.11 (J)	0.13 (J)	0.12 (J)	0.12 (J)	0.11 (J)	–	0.14 (J)	–	–	–	0.0007 (J)	–	0.26 (J)
RE39-09-5020	39-604806	0.0–1.0	Soil	0.059 (J-)	–	–	0.086 (J-)	0.39 (J)	–	0.22 (J-)	0.22 (J-)	0.18 (J-)	0.12 (J-)	0.25 (J-)	0.065 (J-)	0.26 (J-)	0.048 (J-)	–	–	–	–	0.56 (J-)
RE39-09-5021	39-604806	1.0–2.0	Soil	0.046 (J)	–	–	0.081 (J)	0.066 (J)	–	0.19 (J)	0.21 (J)	0.14 (J)	0.11 (J)	0.22 (J)	0.082 (J)	0.23 (J)	0.062 (J)	–	–	–	–	0.46
RE39-09-5022	39-604806	2.0–3.0	Soil	0.04 (J)	–	–	0.068 (J)	0.024 (J)	–	0.13 (J)	0.12 (J)	0.095 (J)	0.057 (J)	0.12 (J)	–	0.14 (J)	–	–	–	–	–	0.32 (J)
RE39-09-5024	39-604807	1.0–2.0	Soil	0.25 (J)	–	–	0.35 (J)	–	–	0.46	0.4	0.29 (J)	0.16 (J)	0.38 (J)	–	0.48	–	–	0.14 (J)	–	–	1.1
RE39-09-5026	39-604808	0.0–1.0	Soil	0.18 (J)	–	–	0.22 (J)	0.12 (J)	–	0.65	0.7	0.58	0.39	0.64	–	0.8	–	–	0.1 (J)	–	–	1.7
RE39-09-5027	39-604808	1.0–2.0	Soil	–	–	–	–	0.0075 (J)	–	–	–	–	–	–	–	–	–	–	–	–	–	0.067 (J)
RE39-09-5096	39-604808	2.0–3.0	Soil	NA[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE39-09-5029	39-604809	0.0–1.5	Soil	–	–	–	–	0.0064 (J)	–	–	–	–	–	–	–	–	–	–	–	0.00043 (J)	–	0.045 (J)
RE39-09-5031	39-604809	2.0–3.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.00043 (J)	–	–
RE39-09-5032	39-604810	0.0–1.0	Soil	0.22	0.06 (J)	–	0.417	0.0318	0.0167	1.43	1.61	2.82	1.25	–	–	1.64	0.197 (J)	–	–	–	0.000718 (J)	3.72
RE39-09-5033	39-604810	1.0–2.0	Soil	–	–	–	0.0255 (J)	0.0023 (J)	0.0017 (J)	0.106	0.117	0.199	0.113	–	–	0.127	–	–	–	–	–	0.268
RE39-09-5034	39-604810	2.0–3.0	Soil	–	–	–	0.0169 (J)	0.0029 (J)	–	0.0664	0.0732	0.101	0.0498	0.0509	–	0.0793	–	–	–	–	–	0.168
RE39-09-5035	39-604811	0.0–1.0	Soil	1.61	0.201	–	2.44	–	–	6.48	6.75	8.36	4.45	3.69	–	7.3	0.29 (J)	–	0.942 (J)	–	–	15.5
RE39-09-5036	39-604811	1.0–2.0	Soil	0.123	0.0211 (J)	–	0.238	–	–	0.603	0.611	0.7	0.439	–	–	0.671	–	–	–	–	–	1.59
RE39-09-5037	39-604811	2.0–3.0	Soil	0.405	0.054 (J)	–	0.841	–	–	1.9	1.86	2.21	1.52	–	–	2.15	–	–	–	–	–	5.31
RE39-09-5038	39-604812	0.0–1.0	Soil	0.308	–	–	0.607	0.449	0.155	1.34	1.32	1.77	0.841	–	0.908 (J)	1.47	1.11 (J)	–	–	–	–	3.71
RE39-09-5039	39-604812	1.0–2.0	Soil	0.113	0.0119 (J)	–	0.229	0.0432	0.0203	0.393	0.396	0.51	0.258	–	0.0808 (J)	0.472	0.164 (J)	–	–	–	–	1.13

Table 5.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Amino-2,6-dinitrotoluene[4-]	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	Dibenzofuran	Dichlorobenzene[1,2-]	Ethylbenzene	Fluoranthene
RE39-09-5040	39-604812	2.0–3.0	Soil	0.161	–	–	0.385	0.148	0.0391	0.713	0.632	0.741	0.523	–	–	0.787	0.285 (J)	–	–	–	–	2.1
RE39-09-5041	39-604813	0.0–1.0	Soil	0.339	–	–	0.643	0.147	0.0571	1.26	1.25	1.6	0.668	–	–	1.4	0.261 (J)	–	–	–	–	3.47
RE39-09-5042	39-604813	1.0–2.0	Soil	0.327	–	–	0.555	0.127	0.0486	1.23	1.27	1.57	0.799	–	–	1.43	–	–	–	–	–	3.56
RE39-09-5044	39-604814	0.0–1.0	Soil	0.0335 (J)	–	–	0.0626	0.199	0.114	0.198	0.233	0.292	0.134	–	0.19 (J)	0.263	0.0954 (J)	–	–	–	–	0.573
RE39-09-5045	39-604814	1.0–2.0	Soil	–	–	–	0.0179 (J)	0.0963	0.0497	–	0.0637	0.078	0.05	–	0.547	0.0651	0.179 (J)	–	–	–	–	0.159
RE39-09-5046	39-604814	2.0–3.0	Soil	–	–	–	–	0.0333	0.0173	–	0.0228 (J)	0.0256 (J)	0.0146 (J)	0.0165 (J)	–	0.0239 (J)	–	–	–	–	–	0.0512
RE39-09-5047	39-604815	0.0–1.0	Soil	0.15 (J)	–	–	0.23 (J)	0.15 (J)	0.071	0.74	0.88 (J+)	0.77	0.46	0.92	0.25 (J)	0.91	0.3 (J)	0.15 (J)	0.067 (J)	–	–	2.1
RE39-09-5048	39-604815	1.0–2.0	Soil	0.15 (J)	–	–	0.2 (J)	0.15 (J)	–	0.73	0.86 (J+)	0.78	0.47	0.76	0.14 (J)	0.92	0.51	0.16 (J)	0.051 (J)	–	–	2
RE39-09-5049	39-604815	2.0–3.0	Soil	0.085 (J)	–	–	0.12 (J)	0.19 (J)	–	0.43	0.5 (J+)	0.45	0.25 (J)	0.51	0.17 (J)	0.53	0.47	0.084 (J)	–	–	–	1.2
RE39-09-5050	39-604816	0.0–1.0	Soil	1	0.077 (J)	–	1.4	–	–	3.1	3.4 (J+)	2.6	1.6	3.2	0.068 (J)	3.7	–	0.5	0.56	–	–	8.8
RE39-09-5051	39-604816	1.0–2.0	Soil	0.084 (J)	–	–	0.11 (J)	–	–	0.27 (J)	0.28 (J+)	0.23 (J)	0.17 (J)	0.23 (J)	0.16 (J)	0.33 (J)	–	0.053 (J)	0.051 (J)	–	–	0.78
RE39-09-5052	39-604816	2.0–3.0	Soil	–	–	–	0.041 (J)	–	–	0.1 (J)	0.11 (J+)	0.11 (J)	0.058 (J)	0.098 (J)	–	0.12 (J)	–	–	–	–	–	0.29 (J)
RE39-09-5053	39-604817	0.0–1.0	Soil	0.84	0.078 (J)	–	1.3	0.071 (J)	–	3	3.3 (J+)	2.9	1.6	3.1	0.14 (J)	3.4	0.32 (J)	0.46	0.45	–	–	8.1
RE39-09-5054	39-604817	1.0–2.0	Soil	0.3 (J)	–	–	0.46 (J)	–	–	1.2 (J)	1.5 (J)	1.1 (J)	0.9 (J)	1.4 (J)	–	1.4 (J)	0.1 (J)	0.28 (J)	0.16 (J)	–	–	3.4 (J)
RE39-09-5055	39-604817	2.0–3.0	Soil	0.085 (J)	–	–	0.13 (J)	0.021 (J)	–	0.37 (J)	0.4 (J+)	0.31 (J)	0.31 (J)	0.35 (J)	0.057 (J)	0.46	0.05 (J)	0.091 (J)	0.042 (J)	–	–	0.99

Table 5.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Indeno(1,2,3-cd)pyrene	Iodomethane	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
0239-97-0013	39-01051	0.0–0.5	Soil	–	NA	NA	NA	NA	NA	0.46	–	–	–	–	NA	NA
0239-97-0014	39-01053	0.0–0.5	Soil	0.57	NA	NA	NA	NA	NA	0.95	–	–	–	–	NA	NA
0239-97-0001	39-01491	0.0–0.5	Soil	–	NA	NA	NA	NA	NA	1.3	–	–	–	–	NA	NA
0239-97-0010	39-01491	1.0–1.5	Soil	–	NA	NA	NA	NA	NA	–	–	–	–	–	NA	NA
0239-97-0002	39-01492	0.0–0.5	Soil	–	NA	NA	NA	NA	NA	0.64	–	–	–	–	NA	NA
0239-97-0003	39-01493	0.0–0.5	Soil	–	NA	NA	NA	NA	NA	0.51	–	–	–	–	NA	NA
0239-97-0004	39-01494	0.0–0.5	Soil	–	NA	NA	NA	NA	NA	0.8	–	–	–	–	NA	NA
0239-97-0005	39-01495	0.0–0.5	Soil	0.36	NA	NA	NA	NA	NA	1.8	–	–	–	–	NA	NA
0239-97-0006	39-01496	0.0–0.5	Soil	–	NA	NA	NA	NA	NA	–	–	–	–	–	NA	NA
0239-97-0011	39-01496	1.0–1.5	Soil	–	NA	NA	NA	NA	NA	–	–	–	–	–	NA	NA
0239-97-0007	39-01497	0.0–0.5	Soil	2 (J)	NA	NA	NA	NA	NA	3.7 (J)	–	–	0.44 (J)	1.5 (J)	NA	NA
0239-97-0008	39-01498	0.0–0.5	Soil	0.41 (J)	NA	NA	NA	NA	NA	0.91 (J)	–	–	–	–	NA	NA
0239-97-0009	39-01499	0.0–0.5	Soil	0.76 (J)	NA	NA	NA	NA	NA	1.4 (J)	–	–	–	0.52 (J)	NA	NA
RE39-09-5017	39-604805	0.0–1.0	Soil	–	NA	NA	NA	NA	NA	0.21 (J)	–	–	–	–	NA	NA
RE39-09-5018	39-604805	1.0–2.0	Soil	–	NA	NA	NA	NA	NA	0.095 (J)	–	–	–	–	NA	NA
RE39-09-5020	39-604806	0.0–1.0	Soil	0.049 (J-)	NA	NA	NA	NA	NA	0.086 (J-)	–	–	–	0.039 (J-)	NA	NA
RE39-09-5021	39-604806	1.0–2.0	Soil	0.047 (J)	NA	NA	NA	NA	NA	0.085 (J)	–	–	–	–	NA	NA
RE39-09-5022	39-604806	2.0–3.0	Soil	0.049 (J)	NA	NA	NA	NA	NA	–	–	–	–	–	NA	NA
RE39-09-5024	39-604807	1.0–2.0	Soil	0.24 (J)	NA	NA	NA	NA	NA	0.14 (J)	–	–	0.083 (J)	0.23 (J)	NA	NA
RE39-09-5026	39-604808	0.0–1.0	Soil	0.17 (J)	NA	NA	NA	NA	NA	0.35 (J)	–	–	0.041 (J)	0.14 (J)	NA	NA
RE39-09-5027	39-604808	1.0–2.0	Soil	–	NA	NA	NA	NA	NA	–	0.00081 (J)	–	–	–	NA	NA
RE39-09-5096	39-604808	2.0–3.0	Soil	NA	8.07E-06	0.00000178 (J)	0.00000178 (J)	0.00000031 (J)	0.000000191 (J)	NA	NA	NA	NA	NA	6.44E-05	5.74E-06
RE39-09-5029	39-604809	0.0–1.5	Soil	–	NA	NA	NA	NA	NA	–	–	–	–	–	NA	NA
RE39-09-5031	39-604809	2.0–3.0	Soil	–	NA	NA	NA	NA	NA	–	–	–	–	–	NA	NA
RE39-09-5032	39-604810	0.0–1.0	Soil	0.183	NA	NA	NA	NA	NA	1.12	–	0.00233 (J)	0.038 (J)	0.121 (J)	NA	NA
RE39-09-5033	39-604810	1.0–2.0	Soil	–	NA	NA	NA	NA	NA	0.0976	–	0.0024 (J)	–	–	NA	NA
RE39-09-5034	39-604810	2.0–3.0	Soil	–	NA	NA	NA	NA	NA	0.0497	–	–	–	–	NA	NA
RE39-09-5035	39-604811	0.0–1.0	Soil	1.63	NA	NA	NA	NA	NA	4.2	–	–	0.41	1.24	NA	NA
RE39-09-5036	39-604811	1.0–2.0	Soil	0.122	NA	NA	NA	NA	NA	0.392	–	–	0.0297 (J)	0.096	NA	NA
RE39-09-5037	39-604811	2.0–3.0	Soil	0.418	NA	NA	NA	NA	NA	1.35	–	0.00302 (J)	0.108 (J)	0.368	NA	NA
RE39-09-5038	39-604812	0.0–1.0	Soil	0.309	NA	NA	NA	NA	NA	0.793	–	0.00287 (J)	0.0679 (J)	0.198	NA	NA
RE39-09-5039	39-604812	1.0–2.0	Soil	0.133	NA	NA	NA	NA	NA	0.239	–	0.00265 (J)	0.0284 (J)	0.0885	NA	NA

Table 5.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Indeno(1,2,3-cd)pyrene	Iodomethane	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
RE39-09-5040	39-604812	2.0–3.0	Soil	0.249	NA	NA	NA	NA	NA	0.45	–	0.00296 (J)	0.0456 (J)	0.14 (J)	NA	NA
RE39-09-5041	39-604813	0.0–1.0	Soil	0.339	NA	NA	NA	NA	NA	0.628	–	–	0.0777 (J)	0.19	NA	NA
RE39-09-5042	39-604813	1.0–2.0	Soil	0.314	NA	NA	NA	NA	NA	0.743	–	0.00345 (J)	0.0719 (J)	0.186	NA	NA
RE39-09-5044	39-604814	0.0–1.0	Soil	0.0295 (J)	NA	NA	NA	NA	NA	0.132	–	0.00269 (J)	–	0.0129 (J)	NA	NA
RE39-09-5045	39-604814	1.0–2.0	Soil	–	NA	NA	NA	NA	NA	0.0453	–	0.00294 (J)	–	–	NA	NA
RE39-09-5046	39-604814	2.0–3.0	Soil	–	NA	NA	NA	NA	NA	0.0133 (J)	–	0.00267 (J)	–	–	NA	NA
RE39-09-5047	39-604815	0.0–1.0	Soil	0.13 (J)	NA	NA	NA	NA	NA	0.42	–	–	–	0.073 (J)	NA	NA
RE39-09-5048	39-604815	1.0–2.0	Soil	0.11 (J)	NA	NA	NA	NA	NA	0.44	–	–	–	0.038 (J)	NA	NA
RE39-09-5049	39-604815	2.0–3.0	Soil	0.072 (J)	NA	NA	NA	NA	NA	0.22 (J)	–	–	–	–	NA	NA
RE39-09-5050	39-604816	0.0–1.0	Soil	0.98	NA	NA	NA	NA	NA	1.5	–	–	0.21 (J)	0.69	NA	NA
RE39-09-5051	39-604816	1.0–2.0	Soil	0.078 (J)	NA	NA	NA	NA	NA	0.17 (J)	–	–	–	0.055 (J)	NA	NA
RE39-09-5052	39-604816	2.0–3.0	Soil	–	NA	NA	NA	NA	NA	0.054 (J)	–	–	–	–	NA	NA
RE39-09-5053	39-604817	0.0–1.0	Soil	0.82	NA	NA	NA	NA	NA	1.5	–	–	0.16 (J)	0.48	NA	NA
RE39-09-5054	39-604817	1.0–2.0	Soil	0.3 (J)	NA	NA	NA	NA	NA	0.75 (J)	–	–	0.056 (J)	0.17 (J)	NA	NA
RE39-09-5055	39-604817	2.0–3.0	Soil	0.078 (J)	NA	NA	NA	NA	NA	0.27 (J)	–	–	–	0.042 (J)	NA	NA

Table 5.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Phenanthrene	Pyrene	Tetryl	Toluene	Total Petroleum Hydrocarbons Diesel Range Organics	Trichloroethene	Trimethylbenzene[1,2,4-]	Trinitrotoluene[2,4,6-]	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
0239-97-0013	39-01051	0.0–0.5	Soil	1.4	1.9	–	–	51	–	–	–	NA	NA
0239-97-0014	39-01053	0.0–0.5	Soil	3.7	3.8	0.345	–	110	–	–	1.02	NA	NA
0239-97-0001	39-01491	0.0–0.5	Soil	1.8	3	–	–	57	–	–	–	NA	NA
0239-97-0010	39-01491	1.0–1.5	Soil	–	–	–	–	9.1	–	–	–	NA	NA
0239-97-0002	39-01492	0.0–0.5	Soil	1.3	1.9	–	–	18	–	–	–	NA	NA
0239-97-0003	39-01493	0.0–0.5	Soil	2.1	2.4	–	–	56	–	–	–	NA	NA
0239-97-0004	39-01494	0.0–0.5	Soil	2.1	2.9	–	–	34	–	–	–	NA	NA
0239-97-0005	39-01495	0.0–0.5	Soil	4.2	5	–	–	70	–	–	–	NA	NA
0239-97-0006	39-01496	0.0–0.5	Soil	2.9 (J)	3.7 (J)	–	–	41	–	–	–	NA	NA
0239-97-0011	39-01496	1.0–1.5	Soil	–	–	–	–	9.8	–	–	–	NA	NA
0239-97-0007	39-01497	0.0–0.5	Soil	18 (J)	17 (J)	–	–	170	–	–	–	NA	NA
0239-97-0008	39-01498	0.0–0.5	Soil	4 (J)	4.7 (J)	–	–	110	–	–	–	NA	NA
0239-97-0009	39-01499	0.0–0.5	Soil	7.3 (J)	7.6 (J)	–	–	43	–	–	–	NA	NA
RE39-09-5017	39-604805	0.0–1.0	Soil	0.48	0.83	–	–	NA	–	–	–	NA	NA
RE39-09-5018	39-604805	1.0–2.0	Soil	0.14 (J)	0.28 (J)	–	–	NA	–	–	–	NA	NA
RE39-09-5020	39-604806	0.0–1.0	Soil	0.46 (J-)	0.49 (J-)	–	–	NA	–	–	–	NA	NA
RE39-09-5021	39-604806	1.0–2.0	Soil	0.39	0.41	–	–	NA	0.00084 (J)	–	–	NA	NA
RE39-09-5022	39-604806	2.0–3.0	Soil	0.31 (J)	0.28 (J)	–	–	NA	–	–	–	NA	NA
RE39-09-5024	39-604807	1.0–2.0	Soil	1.2	0.99	–	–	NA	–	–	–	NA	NA
RE39-09-5026	39-604808	0.0–1.0	Soil	1.4	1.5	–	–	NA	–	–	–	NA	NA
RE39-09-5027	39-604808	1.0–2.0	Soil	0.045 (J)	0.059 (J)	–	–	NA	–	–	–	NA	NA
RE39-09-5096	39-604808	2.0–3.0	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE39-09-5029	39-604809	0.0–1.5	Soil	0.038 (J)	0.041 (J)	–	–	NA	–	–	–	NA	NA
RE39-09-5031	39-604809	2.0–3.0	Soil	–	–	–	–	NA	–	–	–	NA	NA
RE39-09-5032	39-604810	0.0–1.0	Soil	2.38	3.25	–	0.0233	NA	0.000747 (J)	–	–	0.000501 (J)	0.00177 (J)
RE39-09-5033	39-604810	1.0–2.0	Soil	0.151	0.234	–	–	NA	–	–	–	–	–
RE39-09-5034	39-604810	2.0–3.0	Soil	0.0961	0.148	–	–	NA	–	–	–	–	–
RE39-09-5035	39-604811	0.0–1.0	Soil	13.6	14.1	–	–	NA	–	–	–	–	–
RE39-09-5036	39-604811	1.0–2.0	Soil	1.28	1.37	–	–	NA	–	–	–	–	–
RE39-09-5037	39-604811	2.0–3.0	Soil	4.36	4.41	–	–	NA	–	–	–	–	–
RE39-09-5038	39-604812	0.0–1.0	Soil	3.11	3.27	–	–	NA	0.000501 (J)	–	–	–	–
RE39-09-5039	39-604812	1.0–2.0	Soil	1.04	0.939	–	–	NA	–	–	–	–	–
RE39-09-5040	39-604812	2.0–3.0	Soil	1.95	1.56	–	–	NA	–	–	–	–	–

Table 5.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Phenanthrene	Pyrene	Tetryl	Toluene	Total Petroleum Hydrocarbons Diesel Range Organics	Trichloroethene	Trimethylbenzene[1,2,4-]	Trinitrotoluene[2,4,6-]	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
RE39-09-5041	39-604813	0.0–1.0	Soil	3.03	2.94	–	0.000375 (J)	NA	–	–	–	0.000624 (J)	0.00091 (J)
RE39-09-5042	39-604813	1.0–2.0	Soil	2.96	2.96	–	–	NA	–	–	–	–	–
RE39-09-5044	39-604814	0.0–1.0	Soil	0.368	0.476	–	0.000326 (J)	NA	–	–	–	–	–
RE39-09-5045	39-604814	1.0–2.0	Soil	0.102	0.136	–	–	NA	–	–	–	–	–
RE39-09-5046	39-604814	2.0–3.0	Soil	0.0296 (J)	0.046	–	–	NA	–	–	–	–	–
RE39-09-5047	39-604815	0.0–1.0	Soil	1.3	1.7	–	–	NA	–	0.00047 (J)	–	NA	NA
RE39-09-5048	39-604815	1.0–2.0	Soil	1.3	1.9	–	–	NA	–	–	–	NA	NA
RE39-09-5049	39-604815	2.0–3.0	Soil	0.74	1	–	–	NA	–	–	–	NA	NA
RE39-09-5050	39-604816	0.0–1.0	Soil	7.1	7.6	–	–	NA	–	–	–	NA	NA
RE39-09-5051	39-604816	1.0–2.0	Soil	0.66	0.7	–	–	NA	–	–	–	NA	NA
RE39-09-5052	39-604816	2.0–3.0	Soil	0.21 (J)	0.24 (J)	–	–	NA	–	–	–	NA	NA
RE39-09-5053	39-604817	0.0–1.0	Soil	6.3	7.2	–	–	NA	–	–	–	NA	NA
RE39-09-5054	39-604817	1.0–2.0	Soil	2.6 (J)	3.2 (J)	–	–	NA	–	–	–	NA	NA
RE39-09-5055	39-604817	2.0–3.0	Soil	0.74	0.94	–	–	NA	–	–	–	NA	NA

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] – = If analyzed, sample result is not detected.

[b] NA = Not analyzed.

Table 5.3-4
Summary of Radionuclides Detected or Detected above BVs/FVs at SWMU 39-002(a) Area 1

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Tritium	Uranium-238
Soil Background Value				**1.65**[a]	**0.054**[a]	**na**[b]	**2.29**
0239-97-0014	39-01053	0.0–0.5	Soil	NA[c]	NA	NA	3.88
0239-97-0009	39-01499	0.0–0.5	Soil	NA	NA	NA	6.32
RE39-09-5024	39-604807	1.0–2.0	Soil	–[d]	0.105	–	–
RE39-09-5032	39-604810	0.0–1.0	Soil	–	–	–	–
RE39-09-5038	39-604812	0.0–1.0	Soil	–	–	0.11291	8.21
RE39-09-5040	39-604812	2.0–3.0	Soil	–	–	–	2.98
RE39-09-5041	39-604813	0.0–1.0	Soil	–	–	–	–
RE39-09-5044	39-604814	0.0–1.0	Soil	–	–	–	–

Source: BVs/FVs from LANL (1998, 059730).

Notes: Units are pCi/g. Data qualifiers are defined in Appendix A.

[a] Applies only to samples from 0 to 1 ft bgs.

[b] na = Not available.

[c] NA = Not analyzed.

[d] – = If analyzed, sample result is less than BV/FV. If no BV/FV is available, analyte was not detected.

Table 5.3-5
Summary of COPCs for SWMU 39-002(a) Storage Area 1

Soil
Inorganic COPCs
Antimony
Cadmium
Copper
Cyanide
Lead
Mercury
Nickel
Nitrate
Perchlorate
Silver
Thallium
Zinc
Organic COPCs
Acenaphthene
Acenaphthylene
Amino-2,6-dinitrotoluene[4-]
Anthracene
Aroclor-1254

Table 5.3-5 (continued)

Soil
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
Dibenzofuran
1,2-dichlorobenzene
Ethylbenzene
Fluoranthene
Fluorene
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
Hexachlorodibenzodioxin[1,2,3,4,7,8-]
Hexachlorodibenzodioxin [1,2,3,6,7,8-]
Hexachlorodibenzodioxin [1,2,3,7,8,9-]
Indeno(1,2,3-cd)pyrene
Iodomethane
Methylene chloride
Methylnaphthalene [2-]
Naphthalene
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
Phenanthrene
Pyrene
Tetryl
Toluene
TPH-DRO
Trichloroethene
Trimethylbenzene[1,2,4-]
Trinitrotoluene[2,4,6-]
Xylene[1,2-]
Xylene[1,3-]+xylene[1,4-]
Radionuclide COPCs
Cesium-137
Plutonium-239/240
Tritium
Uranium-238

Table 5.5-1
Summary of Samples Collected and Analyses Requested at SWMU 39-002(a) Area 3

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-4468	39-604731	0.5–1.0	Soil	X[a]	X	–[b]	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4469	39-604731	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4470	39-604732	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4484	39-604732	0.5–1.0	Soil	–	–	X	–	–	–	–	–	–	–	–	–	–	–
RE39-09-4471	39-604732	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4472	39-604733	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4473	39-604733	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4474	39-604734	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4475	39-604734	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4476	39-604735	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4477	39-604735	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4478	39-604736	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4479	39-604736	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4480	39-604737	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4481	39-604737	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4482	39-604738	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4483	39-604738	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X

[a] X = Analysis was performed.

[b] – = Analysis not requested.

Table 5.5-2
Summary of Inorganic Chemicals above BVs at SWMU 39-002(a) Area 3

Sample ID	Location ID	Depth (ft)	Media	Antimony	Copper	Cyanide (Total)	Lead	Nitrate	Sodium	Zinc
Soil Background Value				**0.83**	**14.7**	**0.5**	**22.3**	**na**[a]	**915**	**48.8**
RE39-09-4468	39-604731	0.5–1.0	Soil	–[b]	–	0.54 (U)	–	0.4	–	–
RE39-09-4469	39-604731	1.0–2.0	Soil	–	–	–	–	0.53	–	–
RE39-09-4470	39-604732	0.5–1.0	Soil	–	78	0.53 (U)	–	–	–	64.5
RE39-09-4471	39-604732	1.0–2.0	Soil	0.94 (U)	–	–	–	1.1	–	–
RE39-09-4473	39-604733	1.0–2.0	Soil	–	–	–	–	0.43	–	–
RE39-09-4474	39-604734	0.5–1.0	Soil	–	–	0.53 (U)	–	0.14 (J)	–	–
RE39-09-4475	39-604734	1.0–2.0	Soil	–	–	–	–	0.18 (J)	1070 (J+)	–
RE39-09-4476	39-604735	0.5–1.0	Soil	–	–	–	–	0.36	–	–
RE39-09-4477	39-604735	1.0–2.0	Soil	–	–	–	–	0.43	–	–
RE39-09-4478	39-604736	0.5–1.0	Soil	–	–	–	24.6	0.31	–	–
RE39-09-4479	39-604736	1.0–2.0	Soil	–	–	–	–	0.26	–	–
RE39-09-4480	39-604737	0.0–1.0	Soil	–	–	–	–	4.4	–	–
RE39-09-4481	39-604737	0.5–1.0	Soil	–	–	0.56 (U)	–	5.8	–	–
RE39-09-4482	39-604738	0.5–1.0	Soil	–	–	–	–	0.98	–	–
RE39-09-4483	39-604738	1.0–2.0	Soil	–	–	–	–	0.52	–	–

Source: BVs from LANL (1998, 059730).

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] na = Not available.

[b] – = If analyzed, sample result is less than the BV.

Table 5.5-3
Summary of Organic Chemicals Detected at SWMU 39-002(a) Area 3

Sample ID	Location ID	Depth (ft)	Media	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	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	**Heptachlorodibenzofuran[1,2,3,4,7,8,9-]**
RE39-09-4468	39-604731	0.5–1.0	Soil	–[a]	0.053 (J)	–	–	0.17 (J)	0.18 (J+)	0.15 (J)	0.084 (J)	0.18 (J)	–	0.19 (J)	–	0.39	NA[b]	NA	NA
RE39-09-4469	39-604731	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	0.16 (J)	–	–	–	NA	NA	NA
RE39-09-4470	39-604732	0.5–1.0	Soil	–	–	0.0099 (J)	–	0.094 (J)	0.11 (J+)	0.096 (J)	0.067 (J)	0.11 (J)	0.43	0.12 (J)	–	0.22 (J)	NA	NA	NA
RE39-09-4484	39-604732	0.5–1.0	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.27E-05	7.9E-06	0.00000028 (J)
RE39-09-4471	39-604732	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	NA	NA	NA
RE39-09-4472	39-604733	0.5–1.0	Soil	–	–	0.011 (J)	–	0.066 (J)	0.078 (J+)	0.066 (J)	0.045 (J)	0.074 (J)	0.065 (J)	0.094 (J)	0.069 (J)	0.17 (J)	NA	NA	NA
RE39-09-4473	39-604733	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	0.054 (J)	NA	NA	NA
RE39-09-4474	39-604734	0.5–1.0	Soil	–	–	0.011 (J)	–	–	–	–	–	–	–	–	–	0.047 (J)	NA	NA	NA
RE39-09-4475	39-604734	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	NA	NA	NA
RE39-09-4476	39-604735	0.5–1.0	Soil	–	0.037 (J)	–	–	0.13 (J)	0.14 (J)	0.11 (J)	0.091 (J)	0.13 (J)	0.14 (J)	0.18 (J)	0.54	0.38	NA	NA	NA
RE39-09-4477	39-604735	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	0.051 (J)	NA	NA	NA
RE39-09-4478	39-604736	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	0.1 (J)	–	–	0.049 (J)	NA	NA	NA
RE39-09-4479	39-604736	1.0–2.0	Soil	0.013 (J)	–	–	–	–	–	–	–	–	–	–	–	–	NA	NA	NA
RE39-09-4480	39-604737	0.0–1.0	Soil	–	–	–	–	0.049 (J)	0.06 (J)	0.056 (J)	0.046 (J)	0.056 (J)	0.61	0.064 (J)	–	0.11 (J)	NA	NA	NA
RE39-09-4481	39-604737	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–	0.038 (J)	–	0.061 (J)	NA	NA	NA
RE39-09-4482	39-604738	0.5–1.0	Soil	–	–	0.013 (J)	0.0091 (J)	0.052 (J)	0.063 (J)	0.058 (J)	0.045 (J)	0.068 (J)	0.47	0.066 (J)	–	0.12 (J)	NA	NA	NA
RE39-09-4483	39-604738	1.0–2.0	Soil	–	–	–	–	–	0.043 (J+)	–	–	–	–	0.045 (J)	–	0.077 (J)	NA	NA	NA

Table 5.5-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Indeno(1,2,3-cd)pyrene	Iodomethane	Methylene Chloride	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	PETN	Phenanthrene	Pyrene	Trichlorofluoromethane
RE39-09-4468	39-604731	0.5–1.0	Soil	NA	NA	NA	NA	0.072 (J)	–	0.0015 (J)	NA	NA	–	0.23 (J)	0.33 (J)	–
RE39-09-4469	39-604731	1.0–2.0	Soil	NA	NA	NA	NA	–	–	–	NA	NA	–	–	–	–
RE39-09-4470	39-604732	0.5–1.0	Soil	NA	NA	NA	NA	–	–	–	NA	NA	–	0.12 (J)	0.2 (J)	–
RE39-09-4484	39-604732	0.5–1.0	Soil	0.000000421 (J)	0.000000805 (J)	0.0000011 (J)	0.000000483 (J)	NA	NA	NA	0.000779	9.19E-06	NA	NA	NA	NA
RE39-09-4471	39-604732	1.0–2.0	Soil	NA	NA	NA	NA	–	0.00077 (J)	–	NA	NA	–	–	–	–
RE39-09-4472	39-604733	0.5–1.0	Soil	NA	NA	NA	NA	–	–	0.0019 (J)	NA	NA	–	0.12 (J)	0.15 (J)	–
RE39-09-4473	39-604733	1.0–2.0	Soil	NA	NA	NA	NA	–	–	–	NA	NA	–	0.043 (J)	0.048 (J)	–
RE39-09-4474	39-604734	0.5–1.0	Soil	NA	NA	NA	NA	–	–	0.002 (J)	NA	NA	–	–	0.045 (J)	–
RE39-09-4475	39-604734	1.0–2.0	Soil	NA	NA	NA	NA	–	–	–	NA	NA	0.02 (J+)	–	–	–
RE39-09-4476	39-604735	0.5–1.0	Soil	NA	NA	NA	NA	0.079 (J)	–	–	NA	NA	–	0.24 (J)	0.38	–
RE39-09-4477	39-604735	1.0–2.0	Soil	NA	NA	NA	NA	–	–	0.0016 (J)	NA	NA	–	–	0.048 (J)	–
RE39-09-4478	39-604736	0.5–1.0	Soil	NA	NA	NA	NA	–	–	–	NA	NA	–	–	0.048 (J)	–
RE39-09-4479	39-604736	1.0–2.0	Soil	NA	NA	NA	NA	–	–	0.0027 (J)	NA	NA	–	–	–	–
RE39-09-4480	39-604737	0.0–1.0	Soil	NA	NA	NA	NA	–	–	–	NA	NA	–	0.063 (J)	0.12 (J)	0.00037 (J)
RE39-09-4481	39-604737	0.5–1.0	Soil	NA	NA	NA	NA	–	–	0.0018 (J)	NA	NA	–	–	0.055 (J)	–
RE39-09-4482	39-604738	0.5–1.0	Soil	NA	NA	NA	NA	–	–	–	NA	NA	–	0.069 (J)	0.11 (J)	–
RE39-09-4483	39-604738	1.0–2.0	Soil	NA	NA	NA	NA	–	–	0.0032 (J)	NA	NA	–	0.041 (J)	0.067 (J)	–

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] – = If analyzed, sample result is not detected.

[b] NA = Not analyzed.

Table 5.5-4
Summary of COPCs for SWMU 39-002(a) Storage Area 3

Soil
Inorganic COPCs
Antimony
Copper
Cyanide
Lead
Nitrate
Sodium
Zinc
Organic COPCs
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
Fluoranthene
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
Heptachlorodibenzofuran [1,2,3,4,7,8,9-]
Hexachlorodibenzodioxin[1,2,3,4,7,8-]
Hexachlorodibenzodioxin[1,2,3,6,7,8-]
Hexachlorodibenzodioxin[1,2,3,7,8,9-]
Hexachlorodibenzofuran[2,3,4,6,7,8-]
Indeno(1,2,3-cd)pyrene
Iodomethane
Methylene chloride
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
PETN
Phenanthrene
Pyrene
Trichlorofluoromethane

Table 5.7-1
Summary of Samples Collected and Analyses Requested for AOC 39-002(c)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins and Furans	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-4499	39-604742	0.5–1.0	Soil	X[a]	–[b]	X	X	X	X	X	X
RE39-09-4500	39-604742	1.0–2.0	Soil	X	–	X	X	X	X	X	X
RE39-09-4501	39-604743	0.5–1.0	Soil	X	–	X	X	X	X	X	X
RE39-09-4502	39-604743	1.0–2.0	Soil	X	–	X	X	X	X	X	X
RE39-09-4503	39-604744	0.5–1.0	Soil	X	–	X	X	X	X	X	X
RE39-09-4504	39-604744	1.0–2.0	Soil	X	–	X	X	X	X	X	X
RE39-09-4505	39-604745	0.5–1.0	Soil	X	–	X	X	X	X	X	X
RE39-09-4506	39-604745	1.0–2.0	Soil	X	–	X	X	X	X	X	X
RE39-09-4507	39-604746	0.5–1.0	Soil	X	X	X	X	X	X	X	X
RE39-09-4508	39-604746	1.0–2.0	Soil	X	–	X	X	X	X	X	X

[a] X = Analysis was performed.

[b] – = Analysis not requested.

Table 5.7-2
Summary of Inorganic Chemicals above BVs at AOC 39-002(c)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Copper	Cyanide (Total)	Lead	Mercury	Nitrate	Zinc
Soil Background Value				**0.83**	**0.4**	**14.7**	**0.5**	**22.3**	**0.1**	**na**[a]	**48.8**
RE39-09-4499	39-604742	0.5–1.0	Soil	1.14 (U)	0.569 (U)	–[b]	–	–	–	0.784 (J)	–
RE39-09-4500	39-604742	1.0–2.0	Soil	1.15 (U)	0.574 (U)	–	–	–	–	0.905 (J)	–
RE39-09-4501	39-604743	0.5–1.0	Soil	1.12 (U)	0.561 (U)	–	0.899	–	–	1.12	–
RE39-09-4502	39-604743	1.0–2.0	Soil	1.18 (U)	0.588 (U)	–	–	–	–	1.29	–
RE39-09-4503	39-604744	0.5–1.0	Soil	1.06 (U)	0.966	20.6	–	26	0.138	1.56	112
RE39-09-4504	39-604744	1.0–2.0	Soil	1.17 (U)	–	–	–	–	–	1.41	51.5
RE39-09-4505	39-604745	0.5–1.0	Soil	1.12 (U)	0.558 (U)	–	–	–	–	1.14	–
RE39-09-4506	39-604745	1.0–2.0	Soil	1.17 (U)	0.587 (U)	–	–	–	–	1.46	–
RE39-09-4507	39-604746	0.5–1.0	Soil	1.1 (U)	–	–	–	–	–	3.27	57.2
RE39-09-4508	39-604746	1.0–2.0	Soil	1.19 (U)	0.593 (U)	–	–	–	–	2.02	–

Source: BVs from LANL (1998, 059730).

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] na = Not available.

[b] – = If analyzed, sample result is less than the BV.

Table 5.7-3
Summary of Organic Chemicals Detected at AOC 39-002(c)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1254	Benzo(a)anthracene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Toluene	Xylene[1,3-]+Xylene[1,4-]
RE39-09-4499	39-604742	0.5–1.0	Soil	–[a]	–	NA[b]	NA	NA	NA	NA	NA	NA	NA	NA	0.00145	–
RE39-09-4500	39-604742	1.0–2.0	Soil	–	–	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.000408 (J)	–
RE39-09-4501	39-604743	0.5–1.0	Soil	0.0158 (J)	–	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00101 (J)	–
RE39-09-4505	39-604745	0.5–1.0	Soil	–	–	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.000451 (J)	–
RE39-09-4507	39-604746	0.5–1.0	Soil	–	0.0474 (J)	1.87E-05	2.51E-06	0.000000232 (J)	0.000000224 (J)	0.000000597 (J)	0.000000392 (J)	0.00000017 (J)	0.000149	7.32E-06	0.000987 (J)	0.000608 (J)
RE39-09-4508	39-604746	1.0–2.0	Soil	0.0024 (J)	–	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.000426 (J)	–

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.
[a] – = If analyzed, sample result is not detected.
[b] NA = Not analyzed.

Table 5.7-4
Summary of COPCs for AOC 39-002(c)

Soil
Inorganic COPCs
Antimony
Copper
Cyanide
Mercury
Nitrate
Zinc
Organic COPCs
Aroclor-1254
Benzo(a)anthracene
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]
Hexachlorodibenzodioxin[1,2,3,4,7,8-]
Hexachlorodibenzodioxin[1,2,3,6,7,8-]
Hexachlorodibenzodioxin[1,2,3,7,8,9-]
Hexachlorodibenzofuran[1,2,3,4,7,8-]
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
Hexachlorodibenzofuran[1,2,3,4,7,8-]
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
Toluene
Xylene[1,3-]+xylene[1,4-]

Table 5.8-1
Summary of Samples Collected and Analyses Requested for AOC 39-002(f)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxin and Furans	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-3605	39-604512	0.5–1.0	Soil	X[a]	–[b]	X	X	X	X	X	X
RE39-09-3606	39-604512	1.0–2.0	Soil	X	–	X	X	X	X	X	X
RE39-09-3607	39-604513	0.5–1.0	Soil	X	–	X	X	X	X	X	X
RE39-09-3608	39-604513	1.0–2.0	Soil	X	–	X	X	X	X	X	X
RE39-09-3609	39-604514	0.5–1.0	Soil	X	–	X	X	X	X	X	X
RE39-09-3610	39-604514	1.0–2.0	Soil	X	–	X	X	X	X	X	X
RE39-09-3611	39-604515	0.5–1.0	Soil	X	–	X	X	X	X	X	X
RE39-09-3612	39-604515	1.0–2.0	Soil	X	–	X	X	X	X	X	X
RE39-09-3613	39-604516	0.5–1.0	Soil	X	X	X	X	X	X	X	X
RE39-09-3614	39-604516	1.0–2.0	Soil	X	–	X	X	X	X	X	X

[a] X = Analysis was performed.

[b] – = Analysis not requested.

Table 5.8-2
Summary of Inorganic Chemicals above BVs at AOC 39-002(f)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Copper	Nitrate	Perchlorate
Soil Background Value				**0.83**	**0.4**	**14.7**	**na**[a]	**na**
RE39-09-3605	39-604512	0.5–1.0	Soil	1.11 (J)	0.568 (U)	–[b]	0.763 (J-)	0.00642
RE39-09-3606	39-604512	1.0–2.0	Soil	1.19 (U)	0.597 (U)	–	1.06 (J-)	0.00765
RE39-09-3607	39-604513	0.5–1.0	Soil	1.07 (U)	0.533 (U)	–	–	0.00275
RE39-09-3608	39-604513	1.0–2.0	Soil	1.17 (U)	0.587 (U)	–	1.44 (J-)	0.00655
RE39-09-3609	39-604514	0.5–1.0	Soil	1.1 (U)	0.551 (U)	–	0.883 (J-)	0.00433
RE39-09-3610	39-604514	1.0–2.0	Soil	1.11 (U)	0.556 (U)	–	0.849 (J-)	0.00462
RE39-09-3611	39-604515	0.5–1.0	Soil	1.06 (U)	0.529 (U)	16.6	0.658 (J-)	0.00329
RE39-09-3612	39-604515	1.0–2.0	Soil	1.2 (U)	0.602 (U)	–	1.12 (J-)	0.004
RE39-09-3613	39-604516	0.5–1.0	Soil	1.21 (U)	0.605 (U)	–	0.772 (J-)	0.00393
RE39-09-3614	39-604516	1.0–2.0	Soil	1.2 (U)	0.601 (U)	–	0.931 (J-)	0.00295

Source: BVs from LANL (1998, 059730).

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] na = Not available.

[b] — = If analyzed, sample result is less than the BV.

Table 5.8-3
Summary of Organic Chemicals Detected at AOC 39-002(f)

Sample ID	Location ID	Depth (ft)	Media	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Indeno(1,2,3-cd)pyrene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Phenanthrene	Pyrene	Toluene
RE39-09-3610	39-604514	1.0–2.0	Soil	0.029 (J)	0.0462	0.0175 (J)	0.0287 (J)	0.058	NA[a]	0.0159 (J)	NA	NA	0.0397	0.0595	–[b]
RE39-09-3613	39-604516	0.5–1.0	Soil	–	–	–	–	–	0.00000121 (J)	–	8.66E-06	0.000000426 (J)	–	–	0.000627 (J)
RE39-09-3614	39-604516	1.0–2.0	Soil	–	–	–	–	–	NA	–	NA	NA	–	–	0.00047 (J)

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] NA = Not analyzed.

[b] – = If analyzed, sample result is not detected.

Table 5.8-4
Summary of COPCs for AOC 39-002(f)

Soil
Inorganic COPCs
Antimony
Copper
Cadmium
Nitrate
Perchlorate
Organic COPCs
Aroclor-1254
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b) fluoranthene
Benzo(g,h,i)perylene
Organic COPCs
Chrysene
Fluoranthene
indeno(1,2,3-cd)pyrene
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
Phenanthrene
Pyrene
toluene

Table 5.9-1
Summary of Samples Collected and Analyses Requested for SWMU 39-004(c)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins and Furans	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	Uranium	VOCs	pH + Cyanide
0239-95-0148	39-01249	0.0–0.5	Soil	–[a]	–	–	–	X[b]	–	X	–	X	–	–	X	X	–	X
0239-95-0149	39-01250	0.0–0.5	Soil	–	–	–	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0150	39-01251	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0151	39-01252	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0153	39-01284	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0154	39-01284	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0155	39-01285	0.0–0.5	Soil	–	–	–	–	–	–	X	–	X	–	–	X	–	–	X
0239-95-0156	39-01285	0.5–0.83	Soil	–	–	–	–	–	–	X	–	X	–	–	X	–	–	X
0239-95-0157	39-01286	0.0–0.5	Soil	–	–	–	–	–	–	X	–	X	–	–	X	–	–	X
0239-95-0158	39-01286	0.5–0.83	Soil	–	–	–	–	–	–	X	–	X	–	–	X	–	–	X
0239-95-0159	39-01287	0.0–0.5	Soil	–	–	–	–	–	–	X	–	X	–	–	X	–	–	X
0239-95-0160	39-01287	0.5–0.83	Soil	–	–	–	–	–	–	X	–	X	–	–	X	–	–	X
0239-95-0161	39-01288	0.0–0.5	Soil	–	–	–	–	–	–	X	–	X	–	–	X	–	–	X
0239-95-0163	39-01288	0.5–0.83	Soil	–	–	–	–	–	–	X	–	X	–	–	X	–	–	X
0239-95-0164	39-01289	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0165	39-01289	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0166	39-01290	0.0–0.5	Soil	–	–	–	–	–	–	X	–	X	–	–	X	–	–	X
0239-95-0167	39-01290	0.5–0.83	Soil	–	–	–	–	–	–	X	–	X	–	–	X	–	–	X
0239-95-0168	39-01291	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0169	39-01291	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0170	39-01292	0.0–0.5	Soil	–	–	–	–	–	–	X	–	X	–	–	X	–	–	X
0239-95-0171	39-01292	0.5–0.83	Soil	–	–	–	–	–	–	X	–	X	–	–	X	–	–	X
0239-95-0172	39-01293	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X

Table 5.9-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins and Furans	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	Uranium	VOCs	pH + Cyanide
0239-95-0173	39-01293	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0174	39-01324	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0176	39-01324	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0181	39-01327	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0183	39-01328	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0184	39-01328	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0185	39-01329	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0186	39-01329	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0187	39-01330	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0188	39-01330	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0189	39-01331	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0190	39-01331	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0191	39-01332	0.0–0.33	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0194	39-01333	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0195	39-01333	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0196	39-01334	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0197	39-01334	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0198	39-01335	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
RE39-09-4873	39-604758	0.0–1.0	Soil	X	–	X	X	X	X	–	X	X	X	X	X	–	–	X
RE39-09-4874	39-604758	1.0–2.0	Soil	X	–	X	X	X	X	–	X	X	X	X	X	–	X	X
RE39-09-4875	39-604759	0.0–1.0	Sed	X	–	X	X	X	X	–	X	X	X	X	X	–	–	X
RE39-09-4876	39-604759	1.0–2.0	Soil	X	X	X	X	X	X	–	X	X	X	X	X	–	X	X

[a] – = Analysis not requested.

[b] X = Analysis was performed.

Table 5.9-2
Summary of Inorganic Chemicals above BVs at SWMU 39-004(c)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Mercury	Nickel	Nitrate	Selenium	Silver	Thallium	Uranium	Zinc
Soil Background Value				**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**22.3**	**0.1**	**15.4**	**na**[a]	**1.52**	**1**	**0.73**	**1.82**	**48.8**
Sed Background Value				**0.83**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**0.82**	**19.7**	**0.1**	**9.38**	**na**	**0.3**	**1**	**0.73**	**2.22**	**48.8**
0239-95-0148	39-01249	0.0–0.5	Soil	–[b]	–	–	1.9	–	–	–	630 (J)	0.546 (U)	238 (J)	8.5	–	NA[c]	–	–	1.5 (U)	146	183
0239-95-0149	39-01250	0.0–0.5	Soil	–	–	2	–	–	104	14.5	290 (J)	0.582 (U)	419 (J)	0.11 (U)	17.7	NA	–	55.1	1.4 (U)	34540	53
0239-95-0150	39-01251	0.0–0.5	Soil	–	302	–	0.61 (J)	–	–	–	2640 (J)	0.579 (U)	978 (J)	0.11 (U)	–	NA	–	4.1	1.4 (U)	88	115
0239-95-0151	39-01252	0.0–0.5	Soil	–	–	–	–	–	–	–	1050 (J)	0.521 (U)	438 (J)	–	–	NA	–	–	1.4 (J)	81	155
0239-95-0153	39-01284	0.0–0.5	Soil	NA	–	–	0.55 (U)	–	–	–	–	0.55 (U)	–	0.11 (U)	–	NA	–	2.2 (U)	1.1 (U)	–	–
0239-95-0154	39-01284	0.5–0.83	Soil	NA	–	–	0.55 (U)	–	–	–	–	0.55 (U)	–	0.11 (U)	–	NA	–	2.2 (U)	1.1 (U)	–	–
0239-95-0155	39-01285	0.0–0.5	Soil	NA	–	–	0.55 (U)	–	–	–	–	0.55 (U)	–	0.11 (U)	–	NA	–	2.2 (U)	1.1 (U)	–	–
0239-95-0156	39-01285	0.5–0.83	Soil	NA	–	–	0.57 (U)	–	–	–	–	0.57 (U)	–	0.11 (U)	–	NA	–	2.3 (U)	1.1 (U)	1.9	–
0239-95-0157	39-01286	0.0–0.5	Soil	NA	–	–	0.52 (U)	–	–	–	–	0.52 (U)	–	–	–	NA	–	2.1 (U)	1 (U)	–	–
0239-95-0158	39-01286	0.5–0.83	Soil	NA	–	–	0.57 (U)	–	–	–	–	0.57 (U)	–	0.11 (U)	–	NA	–	2.3 (U)	1.1 (U)	2.18	–
0239-95-0159	39-01287	0.0–0.5	Soil	NA	–	–	0.55 (U)	–	–	–	–	0.55 (U)	–	0.11 (U)	–	NA	–	2.2 (U)	1.1 (U)	–	–
0239-95-0160	39-01287	0.5–0.83	Soil	NA	–	–	0.57 (U)	–	–	–	–	0.57 (U)	25	0.11 (U)	–	NA	–	2.3 (U)	1.1 (U)	2.44	–
0239-95-0161	39-01288	0.0–0.5	Soil	NA	–	–	0.53 (U)	–	–	–	16	0.53 (U)	–	0.11 (U)	–	NA	–	2.1 (U)	1.1 (U)	5.82 (J)	–
0239-95-0163	39-01288	0.5–0.83	Soil	NA	–	–	0.53 (U)	–	–	–	–	0.53 (U)	–	0.11 (U)	–	NA	–	2.1 (U)	1.1 (U)	5.19	–
0239-95-0164	39-01289	0.0–0.5	Soil	NA	–	–	0.53 (U)	–	–	–	15	0.53 (U)	26	0.11 (U)	–	NA	–	2.1 (U)	1.1 (U)	12.7	–
0239-95-0165	39-01289	0.5–0.83	Soil	NA	–	–	0.56 (U)	–	–	–	21	0.56 (U)	–	0.11 (U)	–	NA	–	2.2 (U)	1.1 (U)	11.7 (J)	–
0239-95-0166	39-01290	0.0–0.5	Soil	NA	–	–	0.52 (U)	–	–	–	23	0.52 (U)	–	–	–	NA	–	2.1 (U)	1 (U)	23.4	–
0239-95-0167	39-01290	0.5–0.83	Soil	NA	–	–	0.53 (U)	–	–	–	16	0.53 (U)	–	0.11 (U)	–	NA	–	2.1 (U)	1.1 (U)	3.88	–
0239-95-0168	39-01291	0.0–0.5	Soil	NA	–	–	0.54 (U)	–	–	–	–	0.54 (U)	–	0.11 (U)	–	NA	–	2.2 (U)	1.1 (U)	4.63	–
0239-95-0169	39-01291	0.5–0.83	Soil	NA	–	–	0.53 (U)	–	–	–	–	0.53 (U)	–	0.11 (U)	–	NA	–	2.1 (U)	1.1 (U)	5.62	–
0239-95-0170	39-01292	0.0–0.5	Soil	NA	–	–	0.52 (U)	–	–	–	–	0.52 (U)	–	–	–	NA	–	2.1 (U)	1 (U)	5.62 (J)	–
0239-95-0171	39-01292	0.5–0.83	Soil	NA	–	–	0.52 (U)	–	–	–	–	0.52 (U)	–	–	–	NA	–	2.1 (U)	1 (U)	33.1	–
0239-95-0172	39-01293	0.0–0.5	Soil	NA	–	–	0.52 (U)	–	–	–	55	0.52 (U)	–	–	–	NA	–	2.1 (U)	1 (U)	33.1 (J)	60
0239-95-0173	39-01293	0.5–0.83	Soil	NA	–	–	0.51 (U)	–	–	–	–	0.51 (U)	–	–	–	NA	–	2 (U)	1 (U)	4.43	–
0239-95-0174	39-01324	0.0–0.5	Soil	5.3 (U)	–	–	0.67 (U)	–	–	–	–	–	–	–	–	NA	–	1.2 (U)	–	9 (J+)	–
0239-95-0176	39-01324	0.5–0.83	Soil	5.4 (U)	–	–	0.68 (U)	–	–	–	–	–	–	–	–	NA	–	1.2 (U)	–	12.7 (J+)	–
0239-95-0181	39-01327	0.0–0.5	Soil	5.1 (U)	–	–	0.64 (U)	–	–	–	–	–	–	–	–	NA	–	1.1 (U)	–	5.1 (J+)	–
0239-95-0183	39-01328	0.0–0.5	Soil	11 (UJ)	–	–	0.53 (U)	–	–	–	–	0.53 (U)	–	0.11 (U)	–	NA	–	2.1 (U)	–	3.83	–
0239-95-0184	39-01328	0.5–0.83	Soil	11 (UJ)	–	–	0.54 (U)	–	–	–	–	0.54 (U)	–	0.11 (U)	–	NA	–	2.2 (U)	–	3.4	–
0239-95-0185	39-01329	0.0–0.5	Soil	11 (UJ)	–	–	0.53 (U)	–	–	–	15	0.53 (U)	–	0.11 (U)	–	NA	–	2.1 (U)	–	9.2	–
0239-95-0186	39-01329	0.5–0.83	Soil	11 (UJ)	–	–	0.53 (U)	–	–	–	–	53 (U)	–	0.11 (U)	–	NA	–	2.1 (U)	–	14.3	–
0239-95-0187	39-01330	0.0–0.5	Soil	11 (UJ)	–	–	0.53 (U)	–	–	–	–	0.53 (U)	–	0.53 (U)	–	NA	–	2.1 (U)	–	5.56	–
0239-95-0188	39-01330	0.5–0.83	Soil	11 (UJ)	–	–	0.53 (U)	–	–	–	–	0.53 (U)	–	0.11 (U)	–	NA	–	2.1 (U)	–	22.6	–

Table 5.9-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Mercury	Nickel	Nitrate	Selenium	Silver	Thallium	Uranium	Zinc
Soil Background Value				**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**22.3**	**0.1**	**15.4**	**na**[a]	**1.52**	**1**	**0.73**	**1.82**	**48.8**
Sed Background Value				**0.83**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**0.82**	**19.7**	**0.1**	**9.38**	**na**	**0.3**	**1**	**0.73**	**2.22**	**48.8**
0239-95-0189	39-01331	0.0–0.5	Soil	10 (UJ)	–	–	0.52 (U)	–	–	–	–	0.52 (U)	–	–	–	NA	–	2.1 (U)	–	5.09	–
0239-95-0190	39-01331	0.5–0.83	Soil	10 (UJ)	–	–	0.52 (U)	–	–	–	–	1.6	–	–	–	NA	–	2.1 (U)	–	7.05	–
0239-95-0191	39-01332	0.0–0.33	Soil	5.1 (U)	–	–	0.64 (U)	–	–	–	48.3	–	68.7	–	–	NA	–	1.1 (U)	–	15.2 (J+)	50.2
0239-95-0194	39-01333	0.0–0.5	Soil	9.2 (U)	–	–	0.74 (U)	–	–	–	–	0.53 (U)	–	–	–	NA	–	–	–	5.4 (J+)	–
0239-95-0195	39-01333	0.5–0.83	Soil	9.2 (U)	–	–	0.72 (U)	6140	–	–	–	0.53 (U)	24.2	–	–	NA	–	–	1.9 (U)	7.7	52.7
0239-95-0196	39-01334	0.0–0.5	Soil	9.3 (U)	–	–	0.73 (U)	–	–	–	16.7	0.54 (U)	–	–	–	NA	–	–	–	10.6	–
0239-95-0197	39-01334	0.5–0.83	Soil	9.2 (U)	–	–	0.73 (U)	–	–	–	–	0.53 (U)	–	–	–	NA	–	–	–	6.9	–
0239-95-0198	39-01335	0.0–0.5	Soil	8.9 (U)	–	–	0.7 (U)	–	–	–	–	0.51 (U)	–	–	–	NA	–	–	–	4.9	–
RE39-09-4873	39-604758	0.0–1.0	Soil	–	–	–	–	–	–	–	258	–	49	4.97	–	6.7	–	–	–	NA	60.7
RE39-09-4874	39-604758	1.0–2.0	Soil	–	–	–	–	–	–	–	151	–	23.7	0.105 (U)	94.9	0.66	–	–	–	NA	142
RE39-09-4875	39-604759	0.0–1.0	Sed	–	–	–	–	–	–	–	–	–	–	–	–	4.6	0.57 (U)	–	–	–	–
RE39-09-4876	39-604759	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	4.2	–	–	–	NA	–

Source: BVs from LANL (1998, 059730).

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] na = Not available.

[b] – = If analyzed, sample result is less than the BV.

[c] NA = not analyzed.

Table 5.9-3
Summary of Organic Chemicals Detected at SWMU 39-004(c)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1248	Aroclor-1254	Aroclor-1260	Benzoic Acid	Bis(2-chloroethyl)ether	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Di-n-butylphthalate	Heptachlorodibenzodioxin [1,2,3,4,6,7,8-]	Heptachlorodibenzofuran [1,2,3,4,6,7,8-]	Hexachlorodibenzofuran [1,2,3,4,7,8-]	Hexachlorodibenzofuran [1,2,3,6,7,8-]	Naphthalene	Octachlorodibenzodioxin [1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran [1,2,3,4,6,7,8,9-]	Pentachlorodibenzofuran [2,3,4,7,8-]	RDX
0239-95-0148	39-01249	0.0–0.5	Soil	NA[a]	NA	NA	–[b]	–	0.79	–	0.54	NA	NA	NA	NA	–	NA	NA	NA	–
0239-95-0149	39-01250	0.0–0.5	Soil	NA	NA	NA	–	–	0.17 (J)	0.22 (J)	–	NA	NA	NA	NA	–	NA	NA	NA	–
0239-95-0150	39-01251	0.0–0.5	Soil	NA	NA	NA	–	–	0.09 (J)	–	0.72	NA	NA	NA	NA	–	NA	NA	NA	–
0239-95-0151	39-01252	0.0–0.5	Soil	NA	NA	NA	–	–	0.21 (J)	–	0.35	NA	NA	NA	NA	–	NA	NA	NA	–
0239-95-0183	39-01328	0.0–0.5	Soil	NA	NA	NA	–	–	–	–	–	NA	NA	NA	NA	0.17	NA	NA	NA	–
0239-95-0184	39-01328	0.5–0.83	Soil	NA	NA	NA	–	0.17	–	–	–	NA	NA	NA	NA	–	NA	NA	NA	–
0239-95-0190	39-01331	0.5–0.83	Soil	NA	NA	NA	–	–	–	–	0.46	NA	NA	NA	NA	–	NA	NA	NA	–
0239-95-0191	39-01332	0.0–0.33	Soil	NA	NA	NA	–	–	–	–	0.036 (J)	NA	NA	NA	NA	–	NA	NA	NA	–
0239-95-0196	39-01334	0.0–0.5	Soil	NA	NA	NA	0.049 (J)	–	–	–	–	NA	NA	NA	NA	–	NA	NA	NA	–
RE39-09-4873	39-604758	0.0–1.0	Soil	2.1 (J)	0.58 (J)	0.4	–	–	–	–	0.082 (J)	NA	NA	NA	NA	–	NA	NA	NA	–
RE39-09-4874	39-604758	1.0–2.0	Soil	67 (J)	–	6.8	–	–	–	–	0.37 (J)	NA	NA	NA	NA	–	NA	NA	NA	0.058
RE39-09-4876	39-604759	1.0–2.0	Soil	–	–	–	–	–	–	–	–	4.03E-06	0.000000618 (J)	0.0000000747 (J)	0.0000000646 (J)	–	2.85E-05	0.00000155 (J)	0.000000171 (J)	–

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.
[a] NA = Not analyzed.
[b] – = If analyzed, sample result is not detected.

Table 5.9-4
Summary of Radionuclides Detected or Detected above BVs/FVs at SWMU 39-004(c)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-238	Plutonium-239/240	Sodium-22	Thorium-228	Thorium-230	Thorium-232	Uranium-234	Uranium-235/236	Uranium-238
Soil Background Value[a]				**1.65**	**0.023**	**0.054**	**na**[b]	**2.28**	**2.29**	**2.33**	**2.59**	**0.2**	**2.29**
0239-95-0154	39-01284	0.5–0.83	Soil	–[c]	NA[d]	NA	0.0632	–	–	–	NA	NA	NA
0239-95-0165	39-01289	0.5–0.83	Soil	–	NA	NA	–	–	–	–	NA	NA	NA
0239-95-0169	39-01291	0.5–0.83	Soil	–	NA	NA	–	–	–	–	NA	NA	NA
0239-95-0173	39-01293	0.5–0.83	Soil	–	NA	NA	–	–	–	–	NA	NA	NA
0239-95-0174	39-01324	0.0–0.5	Soil	–	NA	NA	–	2.41	2.46	2.37	NA	NA	NA
0239-95-0176	39-01324	0.5–0.83	Soil	–	NA	NA	–	2.55	2.76	2.56	NA	NA	NA
0239-95-0186	39-01329	0.5–0.83	Soil	–	NA	NA	–	–	–	–	NA	NA	NA
0239-95-0188	39-01330	0.5–0.83	Soil	–	NA	NA	–	–	–	–	NA	NA	NA
0239-95-0190	39-01331	0.5–0.83	Soil	–	NA	NA	–	–	–	–	NA	NA	NA
0239-95-0195	39-01333	0.5–0.83	Soil	–	NA	NA	–	2.38	–	–	NA	NA	NA
0239-95-0197	39-01334	0.5–0.83	Soil	–	NA	NA	–	–	–	–	NA	NA	NA
RE39-09-4873	39-604758	0.0–1.0	Soil	–	–	–	–	NA	NA	NA	5.96	0.485	14.8
RE39-09-4874	39-604758	1.0–2.0	Soil	–	–	–	–	NA	NA	NA	7.1	0.61	24.4
RE39-09-4876	39-604759	1.0–2.0	Soil	–	0.133	0.227	–	NA	NA	NA	–	–	–

Source: BVs/FVs from LANL (1998, 059730).

Notes: Units are pCi/g. Data qualifiers are defined in Appendix A.

[a] Applies only to samples from 0 to 1 ft bgs.

[b] na = Not available.

[c] – = If analyzed, sample result is less than BV/FV. If no BV/FV is available, analyte was not detected.

[d] NA = Not analyzed.

Table 5.9-5
Summary of COPCs for SWMU 39-004(c)

Soil	Sediment
Inorganic COPCs	
Antimony	Nitrate
Chromium	Selenium
Cobalt	
Copper	
Cyanide	
Lead	
Mercury	
Nickel	
Nitrate	
Silver	
Thallium	
Uranium	
Zinc	
Radionuclide COPCs	
Cesium-137	None
Plutonium-238	
Plutonium-239/240	
Sodium-22	
Thorium-228	
Thorium-230	
Thorium-232	
Uranium-234	
Uranium-235/236	
Uranium-238	
Organic COPCs	
Aroclor-1248	None
Aroclor-1254	
Aroclor-1260	
Benzoic Acid	
Bis(2-chloroethyl)ether	
Bis(2-ethylhexyl)phthalate	
Butylbenzylphthalate	
Di-n-butylphthalate	
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	
Hexachlorodibenzofuran[1,2,3,4,7,8-]	
Hexachlorodibenzofuran[1,2,3,6,7,8-]	
Naphthalene	
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	
Pentachlorodibenzofuran[2,3,4,7,8-]	
RDX	

Table 5.10-1
Summary of Samples Collected and Analyses Requested for SWMU 39-004(d)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	Uranium	VOCs	pH + Cyanide
0239-95-0099	39-01237	0.0–0.5	Soil	–[a]	–	–	–	X[b]	–	X	–	X	–	–	X	X	–	X
0239-95-0100	39-01238	0.0–0.5	Soil	–	–	–	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0101	39-01239	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0103	39-01240	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0104	39-01241	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0107	39-01242	0.0–0.5	Soil	–	–	–	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0089	39-01253	0.0–0.5	Soil	–	–	–	–	X	–	X	–	X	–	–	X	–	–	–
0239-95-0090	39-01254	0.0–0.5	Soil	–	–	–	–	X	–	X	–	X	–	–	X	–	–	–
0239-95-0091	39-01255	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	–
0239-95-0092	39-01256	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	–
0239-95-0093	39-01257	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0096	39-01258	0.0–0.5	Soil	–	–	–	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0110	39-01263	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0111	39-01263	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0112	39-01264	0.0–0.5	Soil	–	–	–	–	–	–	X	–	X	–	–	X	–	–	X
0239-95-0113	39-01264	0.5–0.83	Soil	–	–	–	–	–	–	X	–	X	–	–	X	–	–	X
0239-95-0114	39-01265	0.0–0.5	Soil	–	–	–	–	–	–	X	–	X	–	–	X	–	–	X
0239-95-0115	39-01265	0.5–0.83	Soil	–	–	–	–	–	–	X	–	X	–	–	X	–	–	X
0239-95-0116	39-01266	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0118	39-01266	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0119	39-01267	0.0–0.5	Soil	–	–	–	–	–	–	X	–	X	–	–	X	–	–	X
0239-95-0120	39-01267	0.5–0.83	Soil	–	–	–	–	–	–	X	–	X	–	–	X	–	–	X
0239-95-0121	39-01268	0.0–0.5	Soil	–	–	–	–	–	–	X	–	X	–	–	X	–	–	X
0239-95-0122	39-01268	0.5–0.83	Soil	–	–	–	–	–	–	X	–	X	–	–	X	–	–	X
0239-95-0123	39-01269	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X

Table 5.10-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	Uranium	VOCs	pH + Cyanide
0239-95-0124	39-01269	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0125	39-01270	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0126	39-01270	0.5–0.83	Soil	–	–	–	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0127	39-01271	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0128	39-01271	0.5–0.83	Soil	–	–	–	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0129	39-01294	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0130	39-01294	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0131	39-01295	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0133	39-01296	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0134	39-01296	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0135	39-01297	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0137	39-01298	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0138	39-01298	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0139	39-01299	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0140	39-01299	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0141	39-01300	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0142	39-01300	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0143	39-01301	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0144	39-01301	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	X	–	X
0239-95-0145	39-01302	0.0–0.5	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
0239-95-0147	39-01302	0.5–0.83	Soil	–	–	X	–	X	–	X	–	X	–	–	X	–	–	X
RE39-09-3596	39-604509	0.0–1.0	Soil	X	X	X	X	X	X	–	X	X	X	X	X	–	X	X
RE39-09-3597	39-604509	1.0–2.0	Qbo	X	X	X	X	X	X	–	X	X	X	X	X	–	X	X
RE39-09-3598	39-604510	0.0–1.0	Soil	X	X	X	X	X	X	–	X	X	X	X	X	–	–	X
RE39-09-3599	39-604510	1.0–2.0	Qbo	X	X	X	X	X	X	–	X	X	X	X	X	–	X	X

[a] – = Analysis not requested.

[b] X = Analysis was performed.

Table 5.10-2
Summary of Inorganic Chemicals above BVs at SWMU 39-004(d)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Thallium	Uranium	Zinc
Soil Background Value				**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**[a]	**na**	**1.52**	**1**	**0.73**	**1.82**	**48.8**
Qbo Background Value				**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**8.89**	**3.96**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**1.22**	**0.72**	**48.8**
0239-95-0099	39-01237	0.0–0.5	Soil	11 (UJ)	–[b]	–	–	0.55 (UJ)	–	–	–	–	0.55 (U)	–	–	–	0.11 (U)	–	NA[c]	NA	–	2.2 (U)	1.1 (U)	7.15	–
0239-95-0100	39-01238	0.0–0.5	Soil	11 (UJ)	–	–	–	0.54 (UJ)	–	–	–	–	0.54 (U)	–	–	–	0.11 (U)	–	NA	NA	–	2.2 (U)	1.1 (U)	6.55	–
0239-95-0101	39-01239	0.0–0.5	Soil	10 (UJ)	–	–	–	0.51 (J-)	–	–	–	54	0.51 (U)	–	–	–	0.41	–	NA	NA	–	2 (U)	1 (U)	551	–
0239-95-0103	39-01240	0.0–0.5	Soil	11 (UJ)	–	–	–	0.53 (UJ)	–	–	–	38	0.53 (U)	–	–	–	0.42	–	NA	NA	–	2.1 (U)	1.1 (U)	166	–
0239-95-0104	39-01241	0.0–0.5	Soil	NA	–	–	–	0.57 (U)	–	–	–	–	0.57 (U)	–	–	–	0.11 (U)	–	NA	NA	–	2.3 (U)	1.1 (U)	9.8	–
0239-95-0107	39-01242	0.0–0.5	Soil	NA	–	–	–	0.59 (U)	–	–	–	–	0.59 (U)	–	–	–	0.12 (U)	–	NA	NA	–	2.4 (U)	1.2 (U)	6.28	52
0239-95-0089	39-01253	0.0–0.5	Soil	11 (UJ)	–	–	–	1.4 (U)	–	–	–	–	0.55 (U)	–	–	–	0.44	–	NA	NA	–	2.2 (U)	–	76.8	–
0239-95-0090	39-01254	0.0–0.5	Soil	11 (UJ)	–	–	–	7.6	–	–	440	3500	0.55 (U)	–	320	–	4	270	NA	NA	–	2.2 (U)	–	264	63
0239-95-0091	39-01255	0.0–0.5	Soil	11 (UJ)	–	–	–	0.78 (U)	–	–	–	–	0.56 (U)	–	120	–	0.44	–	NA	NA	–	2.2 (U)	–	96.9	–
0239-95-0092	39-01256	0.0–0.5	Soil	11 (UJ)	–	–	9.1	1.5	–	–	–	910	0.53 (U)	–	82	–	6.8	–	NA	NA	–	2.1 (U)	1.1 (U)	1300	690
0239-95-0093	39-01257	0.0–0.5	Soil	13 (UJ)	–	–	–	0.65 (UJ)	–	–	–	–	0.65 (U)	–	–	–	0.13 (U)	–	NA	NA	–	2.6 (U)	1.3 (U)	9.4	–
0239-95-0096	39-01258	0.0–0.5	Soil	11 (UJ)	–	–	–	0.56 (UJ)	–	–	–	–	0.56 (U)	–	–	–	0.22	–	NA	NA	–	2.2 (U)	1.1 (U)	73.3	–
0239-95-0110	39-01263	0.0–0.5	Soil	10 (U)	–	–	–	0.52 (U)	–	–	–	–	0.52 (U)	–	–	–	–	–	NA	NA	–	2.1 (U)	–	–	–
0239-95-0111	39-01263	0.5–0.83	Soil	11 (U)	–	–	–	0.53 (U)	–	–	–	–	0.53 (U)	–	–	–	0.11 (U)	–	NA	NA	–	2.1 (U)	–	–	–
0239-95-0112	39-01264	0.0–0.5	Soil	11 (U)	–	–	–	0.53 (U)	–	–	–	–	0.53 (U)	–	–	–	0.11 (U)	–	NA	NA	–	2.1 (U)	–	2.05	–
0239-95-0113	39-01264	0.5–0.83	Soil	11 (U)	–	–	–	0.54 (U)	–	–	–	–	0.54 (U)	–	–	–	0.11 (U)	–	NA	NA	–	2.2 (U)	–	2.65	–
0239-95-0114	39-01265	0.0–0.5	Soil	11 (U)	–	–	–	0.54 (U)	–	–	–	–	0.54 (U)	–	–	–	0.11 (U)	–	NA	NA	–	2.2 (U)	–	5.73	–
0239-95-0115	39-01265	0.5–0.83	Soil	11 (U)	–	–	–	0.56 (U)	–	–	–	–	0.56 (U)	–	–	–	0.11 (U)	–	NA	NA	–	2.2 (U)	–	5.29	–
0239-95-0116	39-01266	0.0–0.5	Soil	11 (U)	–	–	–	0.53 (U)	–	–	–	–	0.53 (U)	–	–	–	0.11 (U)	–	NA	NA	–	2.1 (U)	–	4.92	–
0239-95-0118	39-01266	0.5–0.83	Soil	11 (U)	–	–	–	0.54 (U)	–	–	–	–	0.54 (U)	–	–	–	0.11 (U)	–	NA	NA	–	2.2 (U)	–	7.5	–
0239-95-0119	39-01267	0.0–0.5	Soil	11 (U)	–	–	–	0.53 (U)	–	–	–	–	0.53 (U)	–	–	–	0.11 (U)	–	NA	NA	–	2.1 (U)	–	1.95	–
0239-95-0120	39-01267	0.5–0.83	Soil	11 (U)	–	–	–	0.53 (U)	–	–	–	–	0.53 (U)	–	–	–	0.11 (U)	–	NA	NA	–	2.1 (U)	–	9.6	–
0239-95-0121	39-01268	0.0–0.5	Soil	11 (U)	–	–	–	0.54 (U)	–	–	–	–	0.54 (U)	–	–	–	0.11 (U)	–	NA	NA	–	2.2 (U)	–	32.1	–
0239-95-0122	39-01268	0.5–0.83	Soil	11 (U)	–	–	–	0.54 (U)	–	–	–	–	0.54 (U)	–	–	–	0.11 (U)	–	NA	NA	–	2.2 (U)	–	54.9	–
0239-95-0123	39-01269	0.0–0.5	Soil	11 (U)	–	–	–	0.54 (U)	–	–	–	–	0.54 (U)	–	–	–	0.11 (U)	–	NA	NA	–	2.2 (U)	–	16.4	–
0239-95-0124	39-01269	0.5–0.83	Soil	11 (U)	–	–	–	0.53 (U)	–	–	–	–	0.53 (U)	–	–	–	0.11 (U)	–	NA	NA	–	2.1 (U)	–	23.4	–
0239-95-0125	39-01270	0.0–0.5	Soil	10 (UJ)	–	–	–	0.52 (UJ)	–	–	–	–	0.52 (U)	–	–	–	–	–	NA	NA	–	2.1 (U)	1 (U)	29.8	–
0239-95-0126	39-01270	0.5–0.83	Soil	11 (UJ)	–	–	–	0.53 (UJ)	–	–	–	–	0.53 (U)	–	–	–	0.11 (U)	–	NA	NA	–	2.1 (U)	1.1 (U)	21.2	–
0239-95-0127	39-01271	0.0–0.5	Soil	10 (UJ)	–	–	–	0.52 (UJ)	–	–	–	–	0.52 (U)	–	–	–	–	–	NA	NA	–	2.1 (U)	1 (U)	21.6	–
0239-95-0128	39-01271	0.5–0.83	Soil	11 (UJ)	–	–	–	0.53 (UJ)	–	–	–	–	0.53 (U)	–	–	–	0.11 (U)	–	NA	NA	–	2.1 (U)	1.1 (U)	5.66	–
0239-95-0129	39-01294	0.0–0.5	Soil	11 (UJ)	–	–	–	0.53 (UJ)	–	–	–	–	0.53 (U)	–	–	–	0.11 (U)	–	NA	NA	–	2.1 (U)	1.1 (U)	8.9	–
0239-95-0130	39-01294	0.5–0.83	Soil	10 (UJ)	–	–	–	0.52 (UJ)	–	–	–	–	0.52 (U)	–	–	–	–	–	NA	NA	–	2.1 (U)	1 (U)	17	–
0239-95-0131	39-01295	0.0–0.5	Soil	11 (UJ)	–	–	–	0.53	–	–	–	–	0.53 (U)	–	–	–	0.11	–	NA	NA	–	2.1	1.1 (U)	15.9	–

Table 5.10-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Thallium	Uranium	Zinc
Soil Background Value				**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**[a]	**na**	**1.52**	**1**	**0.73**	**1.82**	**48.8**
Qbo Background Value				**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**8.89**	**3.96**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**1.22**	**0.72**	**48.8**
0239-95-0133	39-01296	0.0–0.5	Soil	11 (UJ)	–	–	–	0.53 (UJ)	–	–	–	–	0.53 (U)	–	–	–	0.11	–	NA	NA	–	2.1 (U)	1.1 (U)	24.9	–
0239-95-0134	39-01296	0.5–0.83	Soil	10 (UJ)	–	–	–	0.52 (UJ)	–	–	–	–	0.52 (U)	–	–	–	–	–	NA	NA	–	2.1 (U)	1 (U)	6.75	–
0239-95-0135	39-01297	0.0–0.5	Soil	10 (UJ)	–	–	–	0.52 (UJ)	–	–	–	–	0.52 (U)	–	–	–	–	–	NA	NA	–	3.1 (J+)	1 (U)	2796	–
0239-95-0137	39-01298	0.0–0.5	Soil	2.8 (UJ)	–	–	–	0.47 (U)	–	–	–	77600 (J-)	0.51 (U)	–	–	–	0.29	–	NA	NA	–	1.2 (U)	–	20	–
0239-95-0138	39-01298	0.5–0.83	Soil	2.8 (UJ)	–	–	–	–	–	–	–	–	0.51 (U)	–	–	–	0.14	–	NA	NA	–	–	–	16.5	–
0239-95-0139	39-01299	0.0–0.5	Soil	2.9 (UJ)	–	–	–	–	–	–	–	–	0.53 (U)	–	–	–	–	–	NA	NA	–	–	–	39.3	–
0239-95-0140	39-01299	0.5–0.83	Soil	2.9 (UJ)	–	–	–	–	–	–	–	–	0.53 (U)	–	–	–	–	–	NA	NA	–	–	–	137	–
0239-95-0141	39-01300	0.0–0.5	Soil	4 (J-)	–	–	–	–	–	–	–	–	0.52 (U)	–	–	–	–	–	NA	NA	–	–	–	8.1	–
0239-95-0142	39-01300	0.5–0.83	Soil	2.8 (UJ)	–	–	–	–	–	–	–	–	0.51 (U)	–	–	–	–	–	NA	NA	–	–	–	3.91	–
0239-95-0143	39-01301	0.0–0.5	Soil	2.8 (UJ)	–	–	–	–	–	–	–	–	0.52 (U)	–	–	–	–	–	NA	NA	–	–	–	9.9	–
0239-95-0144	39-01301	0.5–0.83	Soil	2.9 (UJ)	–	–	–	0.42 (U)	–	–	–	–	0.53 (U)	–	–	–	–	–	NA	NA	–	–	–	4.67	–
0239-95-0145	39-01302	0.0–0.5	Soil	5.6 (U)	–	–	–	0.7 (U)	–	–	–	16.2	–	–	36.7	–	0.31	–	NA	NA	–	1.2 (U)	–	61.9 (J+)	–
0239-95-0147	39-01302	0.5–0.83	Soil	5.2 (U)	–	–	3.6	0.66 (U)	6280	–	–	–	–	–	–	–	–	–	NA	NA	–	1.2 (U)	–	10.3 (J+)	–
RE39-09-3596	39-604509	0.0–1.0	Soil	1.15 (U)	–	–	–	0.577 (U)	–		–	36 (J+)	–	–	–	–	0.564	–	3.54	0.00108 (J)	–	–	–	NA	61.7
RE39-09-3597	39-604509	1.0–2.0	Qbo	1.08 (U)	1.07 (U)	33.2	–	0.54 (U)	–	2.96	–	8.67 (J+)	–	5200	–	211 (J-)	0.198	–	1.44	–	1.07 (U)	–	–	–	–
RE39-09-3598	39-604510	0.0–1.0	Soil	–	–	–	4.1	1.7	–		–	984 (J+)	–	–	84.4	–	4.69	–	–	–	–	–	–	NA	–
RE39-09-3599	39-604510	1.0–2.0	Qbo	–	0.69 (U)	75.6 (J+)	4	–	–	–	–	85.6 (J+)	–	–	24.2	–	1.09	–	–	–	–	–	–	–	–

Source: BVs from LANL (1998, 059730).

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] na = Not available.

[b] – = If analyzed, sample result is less than the BV.

[c] NA = Not analyzed.

Table 5.10-3
Summary of Organic Chemicals Detected at SWMU 39-004(d)

Sample ID	Location ID	Depth (ft)	Media	Amino-2,6-dinitrotoluene[4-]	Amino-4,6-dinitrotoluene[2-]	Anthracene	Aroclor-1260	Bis(2-ethylhexyl)phthalate	Chrysene	Di-n-butylphthalate	HMX	PETN	RDX	TATB
0239-95-0099	39-01237	0.0–0.5	Soil	–[a]	–	–	NA[b]	–	–	–	25.1	NA	9.17	NA
0239-95-0091	39-01255	0.0–0.5	Soil	–	–	–	NA	–	0.18	–	–	NA	–	NA
0239-95-0093	39-01257	0.0–0.5	Soil	–	–	0.18	NA	–	–	–	–	NA	–	NA
0239-95-0133	39-01296	0.0–0.5	Soil	–	–	–	NA	–	–	–	2.33	NA	–	NA
RE39-09-3596	39-604509	0.0–1.0	Soil	–	–	–	0.0067	–	–	–	–	–	–	–
RE39-09-3597	39-604509	1.0–2.0	Qbo	–	–	–	0.0016 (J)	–	–	–	–	–	–	–
RE39-09-3598	39-604510	0.0–1.0	Soil	0.014 (J-)	0.022 (J-)	–	–	0.14 (J)	–	0.1 (J)	3.2 (J-)	0.67 (J-)	0.46 (J-)	2.2 (J-)
RE39-09-3599	39-604510	1.0–2.0	Qbo	0.0092 (J-)	–	–	–	–	–	–	1.2 (J-)	–	0.93 (J-)	0.61 (J-)

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] – = If analyzed, sample result is not detected.

[b] NA = Not analyzed.

Table 5.10-4
Summary of Radionuclides Detected or Detected above BVs/FVs at SWMU 39-004(d)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Europium-152	Sodium-22	Thorium-228	Thorium-230	Thorium-232	Uranium-234	Uranium-235	Uranium-235/236	Uranium-238
Soil Background Value[a]				**1.65**	**na**[b]	**na**	**2.28**	**2.29**	**2.33**	**2.59**	**0.2**	**0.2**	**2.29**
Qbo Background Value				**na**	**na**	**na**	**na**	**na**	**na**	**4**	**na**	**0.18**	**3.9**
0239-95-0101	39-01239	0.0–0.5	–	–[c]	–	–	–	–	–	NA[d]	2.76	NA	NA
0239-95-0103	39-01240	0.0–0.5	–	–	–	–	–	–	–	NA	2.23	NA	NA
0239-95-0090	39-01254	0.0–0.5	Soil	NA	NA	NA	2.53	–	2.63	NA	NA	NA	NA
0239-95-0091	39-01255	0.0–0.5	Soil	–	NA	0.38	–	–	–	NA	0.77	NA	NA
0239-95-0092	39-01256	0.0–0.5	Soil	–	NA	–	3.54	–	3.46	NA	4.53	NA	NA
0239-95-0093	39-01257	0.0–0.5	Soil	–	–	–	3.191	3.198	3.014	NA	–	NA	NA
0239-95-0096	39-01258	0.0–0.5	Soil	NA	NA	NA	2.383	2.446	–	NA	NA	NA	NA
0239-95-0118	39-01266	0.5–0.83	Soil	–	–	–	–	–	–	NA	–	NA	NA
0239-95-0123	39-01269	0.0–0.5	Soil	–	–	–	–	–	–	NA	0.425	NA	NA
0239-95-0124	39-01269	0.5–0.83	Soil	–	–	–	–	–	–	NA	–	NA	NA
0239-95-0130	39-01294	0.5–0.83	Soil	–	–	–	–	–	–	NA	–	NA	NA
0239-95-0134	39-01296	0.5–0.83	Soil	–	–	–	–	–	–	NA	–	NA	NA
0239-95-0135	39-01297	0.0–0.5	Soil	–	–	–	–	–	–	NA	18.3	NA	NA
0239-95-0137	39-01298	0.0–0.5	Soil	–	–	–	2.363	–	–	NA	NA	NA	NA
0239-95-0138	39-01298	0.5–0.83	Soil	–	0.407	–	2.543	–	2.374	NA	NA	NA	NA
0239-95-0139	39-01299	0.0–0.5	Soil	–	0.189	–	–	–	–	NA	NA	NA	NA
0239-95-0140	39-01299	0.5–0.83	Soil	–	–	–	–	–	–	NA	NA	NA	NA
0239-95-0141	39-01300	0.0–0.5	Soil	–	0.234	–	–	–	–	NA	NA	NA	NA
0239-95-0145	39-01302	0.0–0.5	Soil	–	NA	–	2.58	2.59	2.46	NA	0.56	NA	NA
0239-95-0147	39-01302	0.5–0.83	Soil	–	NA	–	2.47	2.46	2.47	NA	–	NA	NA
RE39-09-3596	39-604509	0.0–1.0	Soil	–	–	–	NA	NA	NA	24.5	NA	3.28	193

Table 5.10-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Europium-152	Sodium-22	Thorium-228	Thorium-230	Thorium-232	Uranium-234	Uranium-235	Uranium-235/236	Uranium-238
Soil Background Value[a]				**1.65**	**na**[b]	**na**	**2.28**	**2.29**	**2.33**	**2.59**	**0.2**	**0.2**	**2.29**
Qbo Background Value				**na**	**na**	**na**	**na**	**na**	**na**	**4**	**na**	**0.18**	**3.9**
RE39-09-3597	39-604509	1.0000-2.0000	Qbo	-	-	-	-	-	-	5.74	-	0.506	21.5
RE39-09-3598	39-604510	0.0000-1.0000	Soil	-	-	-	NA	NA	NA	8.47	NA	1.22	56.3
RE39-09-3599	39-604510	1.0000-2.0000	Qbo	-	-	-	-	-	-	5.46	-	0.98	37.2

Source: BVs/FVs from LANL (1998, 059730).

Notes: Units are pCi/g. Data qualifiers are defined in Appendix A.

[a] Applies only to samples from 0 to 1 ft bgs.

[b] na = Not available.

[c] – = If analyzed, sample result is less than BV/FV. If no BV/FV is available, analyte was not detected.

[d] NA = Not analyzed.

Table 5.10-5
Summary of COPCs for SWMU 39-004(d), Firing Site

Soil	Qbo
Inorganic COPCs	
Antimony	Antimony
Barium	Arsenic
Beryllium	Barium
Cadmium	Beryllium
Cobalt	Cadmium
Copper	Chromium
Cyanide	Copper
Lead	Iron
Mercury	Lead
Nickel	Manganese
Nitrate	Mercury
Perchlorate	Nitrate
Silver	Selenium
Thallium	
Uranium	
Zinc	
Organic COPCs	
Amino-2,6-dinitrotoluene[4-]	Amino-2,6-dinitrotoluene[4-]
Amino-4,6-dinitrotoluene[2-]	Aroclor-1260
Anthracene	HMX
Aroclor-1260	RDX
Bis(2-ethylhexyl)phthalate	TATB
Chrysene	
Di-n-butylphthalate	
HMX	
PETN	
RDX	
TATB	
Radionuclide COPCs	
Cesium-137	Uranium-234
Europium-152	Uranium-235/236
Sodium-22	Uranium-238
Thorium-228	
Thorium-230	
Thorium-232	
Uranium-234	
Uranium-235	
Uranium-235/236	
Uranium-238	

Table 5.11-1
Summary of Samples Collected and Analyses Requested for SWMU 39-005

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxin and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-5123	39-604832	0.0–1.0	Soil	X[a]	X	–[b]	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5124	39-604832	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5125	39-604832	2.0–4.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5126	39-604832	4.0–6.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5127	39-604832	6.0–8.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5128	39-604832	8.0–10.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5129	39-604833	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5201	39-604833	0.0–1.0	Soil	–	–	X	–	–	–	–	–	–	–	–	–	–	–
RE39-09-5130	39-604833	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5131	39-604833	2.0–4.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5132	39-604833	4.0–6.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5133	39-604833	6.0–8.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5134	39-604833	8.0–10.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5135	39-604834	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5136	39-604834	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5137	39-604834	2.0–4.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5138	39-604834	4.0–6.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5139	39-604834	6.0–8.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5140	39-604834	8.0–10.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5141	39-604835	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X

Table 5.11-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxin and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-5142	39-604835	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5143	39-604835	2.0–4.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5144	39-604835	4.0–6.0	Qbo	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5145	39-604835	6.0–8.0	Qbo	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5146	39-604835	8.0–10.0	Qbo	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5147	39-604836	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5148	39-604836	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5149	39-604836	2.0–4.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5150	39-604836	4.0–6.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5151	39-604836	6.0–8.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5152	39-604836	8.0–10.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5153	39-604837	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5154	39-604837	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5155	39-604837	2.0–4.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5156	39-604837	4.0–6.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5157	39-604837	6.0–8.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5158	39-604837	8.0–10.0	Qbo	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5159	39-604838	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5160	39-604838	1.0–2.0	Qbo	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5161	39-604838	2.0–4.0	Qbo	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5162	39-604838	4.0–6.0	Qbo	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5192	39-604839	0.0–0.0	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	X
RE39-09-5193	39-604839	0.0–0.0	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	X
RE39-09-5198	39-604839	0.0–0.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	X	–

Table 5.11-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxin and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-5199	39-604839	0.0–0.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	X	–
RE39-09-5165	39-604839	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5166	39-604839	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5186	39-604839	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5167	39-604839	2.0–4.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5168	39-604839	4.0–6.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5169	39-604839	6.0–8.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5170	39-604839	8.0–10.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5187	39-604839	8.0–10.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X

[a] X = Analysis was performed.

[b] – = Analysis not requested.

Table 5.11-2
Summary of Inorganic Chemicals above BVs at SWMU 39-005

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Calcium	Chromium	Copper	Cyanide (Total)	Mercury	Nickel	Nitrate	Selenium	Zinc
Soil Background Value				**0.83**	**8.17**	**6120**	**19.3**	**14.7**	**0.5**	**0.1**	**15.4**	**na**[a]	**1.52**	**48.8**
Qbo Background Value				**0.5**	**0.56**	**1900**	**2.6**	**3.96**	**0.5**	**0.1**	**2**	**na**	**0.3**	**40**
RE39-09-5124	39-604832	1.0–2.0	Soil	–[b]	–	–	–	–	0.58 (UJ)	–	–	–	–	–
RE39-09-5125	39-604832	2.0–4.0	Soil	–	–	–	–	–	0.58 (UJ)	–	–	–	–	–
RE39-09-5126	39-604832	4.0–6.0	Soil	–	–	–	–	–	0.57 (UJ)	–	–	–	–	–
RE39-09-5127	39-604832	6.0–8.0	Soil	–	–	–	–	–	0.58 (UJ)	–	–	–	–	49.8
RE39-09-5128	39-604832	8.0–10.0	Soil	–	–	–	–	–	0.57 (UJ)	–	–	–	–	–
RE39-09-5129	39-604833	0.0–1.0	Soil	–	–	–	–	–	0.54 (UJ)	–	–	–	–	–
RE39-09-5130	39-604833	1.0–2.0	Soil	–	–	–	–	–	0.56 (UJ)	–	–	–	–	–
RE39-09-5131	39-604833	2.0–4.0	Soil	–	–	–	–	–	0.55 (UJ)	–	–	–	–	–
RE39-09-5132	39-604833	4.0–6.0	Soil	–	–	–	–	–	0.54 (UJ)	–	–	–	–	–
RE39-09-5133	39-604833	6.0–8.0	Soil	–	–	–	–	–	0.55 (UJ)	–	–	–	–	–
RE39-09-5134	39-604833	8.0–10.0	Soil	–	–	–	–	–	0.59 (UJ)	–	–	–	–	–
RE39-09-5135	39-604834	0.0–1.0	Soil	–	–	–	–	–	0.55 (UJ)	–	–	–	–	–
RE39-09-5137	39-604834	2.0–4.0	Soil	–	–	–	–	–	0.57 (UJ)	–	–	–	–	–
RE39-09-5138	39-604834	4.0–6.0	Soil	–	–	–	–	–	0.58 (UJ)	–	–	–	–	–
RE39-09-5139	39-604834	6.0–8.0	Soil	–	–	–	–	–	0.57 (UJ)	–	–	–	–	–
RE39-09-5140	39-604834	8.0–10.0	Soil	–	–	–	–	–	0.59 (UJ)	–	–	–	–	–
RE39-09-5141	39-604835	0.0–1.0	Soil	–	–	–	–	–	0.53 (UJ)	–	–	–	–	–
RE39-09-5142	39-604835	1.0–2.0	Soil	–	–	–	–	–	0.55 (UJ)	–	–	–	–	–
RE39-09-5143	39-604835	2.0–4.0	Soil	–	–	–	–	–	0.56 (UJ)	–	–	–	–	–
RE39-09-5144	39-604835	4.0–6.0	Qbo	0.55 (U)	1.1 (U)	–	7.2	–	0.55 (UJ)	–	–	–	–	–
RE39-09-5145	39-604835	6.0–8.0	Qbo	0.56 (U)	1.1 (U)	–	9.2	–	0.56 (UJ)	–	–	–	–	–

Table 5.11-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Calcium	Chromium	Copper	Cyanide (Total)	Mercury	Nickel	Nitrate	Selenium	Zinc
Soil Background Value				**0.83**	**8.17**	**6120**	**19.3**	**14.7**	**0.5**	**0.1**	**15.4**	**na**[a]	**1.52**	**48.8**
Qbo Background Value				**0.5**	**0.56**	**1900**	**2.6**	**3.96**	**0.5**	**0.1**	**2**	**na**	**0.3**	**40**
RE39-09-5146	39-604835	8.0–10.0	Qbo	–	1.2 (U)	–	7.3	32.4	0.58 (UJ)	–	2.6	–	–	–
RE39-09-5147	39-604836	0.0–1.0	Soil	–	–	12900 (J)	–	–	0.52 (UJ)	0.72	–	–	–	–
RE39-09-5148	39-604836	1.0–2.0	Soil	–	–	–	–	–	–	0.244	–	–	–	–
RE39-09-5149	39-604836	2.0–4.0	Soil	–	–	–	–	–	–	0.127	–	–	–	–
RE39-09-5157	39-604837	6.0–8.0	Soil	–	–	–	–	–	–	–	–	0.2 (J)	–	–
RE39-09-5158	39-604837	8.0–10.0	Qbo	–	1.2 (U)	–	5.2	–	–	–	–	0.15 (J)	–	–
RE39-09-5159	39-604838	0.0–1.0	Soil	–	–	–	–	–	–	–	–	0.86	–	–
RE39-09-5160	39-604838	1.0–2.0	Qbo	0.56 (U)	–	–	6.7	–	0.56 (U)	–	2.4	0.68	0.56 (U)	–
RE39-09-5161	39-604838	2.0–4.0	Qbo	0.54 (U)	–	–	5.8	–	0.54 (U)	–	2.7	0.35	–	–
RE39-09-5162	39-604838	4.0–6.0	Qbo	–	1.1 (U)	–	9.9	–	–	–	–	0.18 (J)	–	–
RE39-09-5165	39-604839	0.0–1.0	Soil	–	–	–	–	–	–	–	–	1.7	–	–
RE39-09-5166	39-604839	1.0–2.0	Soil	–	–	–	–	–	–	–	–	0.57	–	–
RE39-09-5167	39-604839	2.0–4.0	Soil	–	–	–	–	–	–	–	–	0.26	–	–
RE39-09-5168	39-604839	4.0–6.0	Soil	–	–	–	–	–	–	–	–	0.32	–	–
RE39-09-5169	39-604839	6.0–8.0	Soil	–	–	–	–	–	–	–	–	0.41	–	–
RE39-09-5170	39-604839	8.0–10.0	Soil	–	–	–	–	–	–	–	–	0.45	–	–

Source: BVs from LANL (1998, 059730).

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] na = Not available.

[b] – = If analyzed, sample result is less than the BV.

Table 5.11-3
Summary of Organic Chemicals Detected at SWMU 39-005

Sample ID	Location ID	Depth (ft)	Media	3,5-Dinitroaniline	Acenaphthene	Acetone	Amino-2,6-dinitrotoluene[4-]	Amino-4,6-dinitrotoluene[2-]	Anthracene	Aroclor-1254	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bromomethane	Chrysene	Dibenzofuran	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]
RE39-09-5123	39-604832	0.0–1.0	Soil	–[a]	–	–	–	–	–	–	0.065 (J)	0.07 (J)	0.068 (J)	–	0.067 (J)	0.00058 (J)	0.076 (J)	–	0.16 (J)	–	NA[b]
RE39-09-5125	39-604832	2.0–4.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.052 (J)	–	NA
RE39-09-5126	39-604832	4.0–6.0	Soil	–	–	–	–	–	–	–	0.17 (J)	0.2 (J)	0.23 (J)	0.11 (J)	0.18 (J)	–	0.18 (J)	–	0.41	–	NA
RE39-09-5127	39-604832	6.0–8.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.057 (J)	–	NA
RE39-09-5128	39-604832	8.0–10.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.071 (J)	–	NA
RE39-09-5129	39-604833	0.0–1.0	Soil	–	–	–	–	–	–	–	0.053 (J)	0.06 (J)	0.053 (J)	0.055 (J)	0.065 (J)	–	0.07 (J)	–	0.14 (J)	–	NA
RE39-09-5201	39-604833	0.0–1.0	Soil	NA	NA	NA	NA	NA	NA	–	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.84E-06
RE39-09-5130	39-604833	1.0–2.0	Soil	–	–	–	–	–	–	–	0.086 (J)	0.083 (J)	0.069 (J)	0.037 (J)	0.09 (J)	0.00053 (J)	0.1 (J)	–	0.23 (J)	–	NA
RE39-09-5131	39-604833	2.0–4.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	NA
RE39-09-5132	39-604833	4.0–6.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	0.00052 (J)	–	–	–	–	NA
RE39-09-5133	39-604833	6.0–8.0	Soil	–	–	–	–	–	–	–	0.088 (J)	0.083 (J)	0.077 (J)	0.042 (J)	0.088 (J)	0.00057 (J)	0.099 (J)	–	0.24 (J)	–	NA
RE39-09-5135	39-604834	0.0–1.0	Soil	–	–	–	–	–	–	–	0.12 (J)	0.14 (J)	0.14 (J)	0.096 (J)	0.15 (J)	–	0.16 (J)	–	0.29 (J)	–	NA
RE39-09-5137	39-604834	2.0–4.0	Soil	–	–	0.01 (J)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	NA
RE39-09-5138	39-604834	4.0–6.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.049 (J)	–	NA
RE39-09-5139	39-604834	6.0–8.0	Soil	–	–	0.025	–	–	–	–	–	–	–	–	–	–	–	–	–	–	NA
RE39-09-5140	39-604834	8.0–10.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	NA
RE39-09-5141	39-604835	0.0–1.0	Soil	–	0.13 (J)	–	–	–	0.18 (J)	–	0.57	0.59 (J+)	0.53	0.28 (J)	0.61 (J+)	–	0.71	0.077 (J)	1.6	0.12 (J)	NA
RE39-09-5142	39-604835	1.0–2.0	Soil	–	–	–	–	–	0.047 (J)	–	0.18 (J)	0.21 (J+)	0.16 (J)	0.13 (J)	0.23 (J+)	–	0.22 (J)	–	0.43	–	NA
RE39-09-5143	39-604835	2.0–4.0	Soil	–	–	0.028	–	–	–	–	0.066 (J)	0.095 (J+)	0.08 (J)	0.062 (J)	0.12 (J+)	–	0.089 (J)	–	0.12 (J)	–	NA
RE39-09-5144	39-604835	4.0–6.0	Qbo		0.073 (J)	0.032	–	–	0.11 (J)	–	0.29 (J)	0.29 (J+)	0.23 (J)	0.15 (J)	0.3 (J+)		0.32 (J)	0.037 (J)	0.68	0.07 (J)	–
RE39-09-5145	39-604835	6.0–8.0	Qbo		–	0.026	–	–	0.045 (J)	0.013 (J)	0.14 (J)	0.15 (J+)	0.12 (J)	0.085 (J)	0.17 (J+)		0.17 (J)	–	0.36 (J)	–	–
RE39-09-5146	39-604835	8.0–10.0	Qbo		–	–	–	–	0.039 (J)	–	0.093 (J)	0.1 (J+)	0.099 (J)	0.068 (J)	0.09 (J+)		0.11 (J)	–	0.21 (J)	–	–
RE39-09-5147	39-604836	0.0–1.0	Soil	–	0.042 (J)	0.012 (J+)	–	–	0.077 (J)	–	0.33 (J)	0.39 (J+)	0.33 (J)	0.25 (J)	0.37 (J+)	–	0.43	–	0.66	0.036 (J)	NA
RE39-09-5148	39-604836	1.0–2.0	Soil	–	0.088 (J)	–	–	–	0.14 (J)	–	0.51	0.5	0.48	0.29 (J)	0.58	–	0.64	0.048 (J)	1.2	0.087 (J)	NA
RE39-09-5149	39-604836	2.0–4.0	Soil	–	–	–	–	–	0.046 (J)	–	0.19 (J)	0.21 (J)	0.19 (J)	0.12 (J)	0.23 (J)	–	0.26 (J)	–	0.47	–	NA
RE39-09-5150	39-604836	4.0–6.0	Soil	–	–	–	–	–	–	–	0.058 (J)	0.053 (J)	0.063 (J)	–	0.064 (J)	–	0.075 (J)	–	0.12 (J)	–	NA
RE39-09-5151	39-604836	6.0–8.0	Soil	0.005 (J)	–	–	0.01 (J)	0.008 (J)	–	–	0.053 (J)	0.047 (J)	0.057 (J)	–	0.061 (J)	–	0.071 (J)	–	0.12 (J)	–	NA
RE39-09-5152	39-604836	8.0–10.0	Soil	0.0071 (J)	–	–	0.014 (J+)	0.018 (J+)	–	–	0.053 (J)	0.045 (J)	0.043 (J)	–	0.052 (J)	–	0.068 (J)	–	0.11 (J)	–	NA
RE39-09-5153	39-604837	0.0–1.0	Soil	–	0.13 (J)	–	–	–	0.22 (J)	–	0.81	0.86	0.81	0.41	0.91	–	1	0.087 (J)	2	0.15 (J)	NA

Table 5.11-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	3,5-Dinitroaniline	Acenaphthene	Acetone	Amino-2,6-dinitrotoluene[4-]	Amino-4,6-dinitrotoluene[2-]	Anthracene	Aroclor-1254	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bromomethane	Chrysene	Dibenzofuran	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]
RE39-09-5154	39-604837	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.044 (J)	–	NA
RE39-09-5155	39-604837	2.0–4.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.048 (J)	–	NA
RE39-09-5157	39-604837	6.0–8.0	Soil	–	–	–	–	–	–	–	0.05 (J)	0.051 (J)	0.044 (J)	0.044 (J)	0.044 (J)	–	0.062 (J)	–	0.11 (J)	–	NA
RE39-09-5158	39-604837	8.0–10.0	Qbo	–	–	–	–	–	–	–	0.043 (J)	0.041 (J)	–	–	0.039 (J)	–	0.056 (J)	–	0.1 (J)	–	–
RE39-09-5159	39-604838	0.0–1.0	Soil	–	0.24 (J)	–	–	–	0.34 (J)	–	1.1	0.99	0.73	0.56	1.1	–	1.3	0.16 (J)	2.6	0.24 (J)	NA
RE39-09-5160	39-604838	1.0–2.0	Qbo	–	0.077 (J-)	–	–	–	0.11 (J-)	–	0.37 (J-)	0.38 (J-)	0.34 (J-)	0.26 (J-)	0.39 (J-)	–	0.46 (J-)	0.046 (J-)	0.94 (J-)	0.078 (J-)	–
RE39-09-5161	39-604838	2.0–4.0	Qbo	–	0.065 (J)	–	–	–	0.11 (J)	–	0.26 (J)	0.24 (J)	0.2 (J)	0.14 (J)	0.23 (J)	–	0.3 (J)	0.043 (J)	0.67	0.076 (J)	–
RE39-09-5162	39-604838	4.0–6.0	Qbo	–	–	–	–	–	0.055 (J)	–	0.15 (J)	0.15 (J)	0.13 (J)	0.088 (J)	0.17 (J)	–	0.18 (J)	–	0.36 (J)	0.038 (J)	–
RE39-09-5165	39-604839	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	0.044 (J)	–	0.045 (J)	–	0.07 (J)	–	NA
RE39-09-5168	39-604839	4.0–6.0	Soil	–	–	0.0094 (J)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	NA
RE39-09-5169	39-604839	6.0–8.0	Soil	–	–	0.0084 (J)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	NA

Table 5.11-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Phenanthrene	Pyrene	RDX	Tetrachlorodibenzodioxin[2,3,7,8-]	Trinitrobenzene[1,3,5-]	Trinitrotoluene[2,4,6-]
RE39-09-5123	39-604832	0.0–1.0	Soil	NA	–	–	–	0.012	–	–	NA	NA	0.089 (J)	0.14 (J)	–	NA	–	–
RE39-09-5125	39-604832	2.0–4.0	Soil	NA	–	–	–	0.012	–	–	NA	NA	–	0.047 (J)	–	NA	–	–
RE39-09-5126	39-604832	4.0–6.0	Soil	NA	–	0.097 (J)	–	–	–	–	NA	NA	0.11 (J)	0.36 (J)	–	NA	–	–
RE39-09-5127	39-604832	6.0–8.0	Soil	NA	–	–	–	–	–	–	NA	NA	–	0.052 (J)	–	NA	–	–
RE39-09-5128	39-604832	8.0–10.0	Soil	NA	–	–	–	–	–	–	NA	NA	–	0.062 (J)	0.0072 (J)	NA	–	–
RE39-09-5129	39-604833	0.0–1.0	Soil	NA	–	0.043 (J)	–	0.013	–	–	NA	NA	0.078 (J)	0.15 (J)	–	NA	–	–
RE39-09-5201	39-604833	0.0–1.0	Soil	0.000000492 (J)	NA	NA	NA	NA	NA	NA	3.39E-05	0.00000107 (J)	NA	NA	NA	0.000000127 (J)	NA	NA
RE39-09-5130	39-604833	1.0–2.0	Soil	NA	0.026 (J)	–	–	0.011	–	0.04 (J)	NA	NA	0.21 (J)	0.19 (J)	–	NA	–	–
RE39-09-5131	39-604833	2.0–4.0	Soil	NA	–	–	–	0.0096	–	–	NA	NA	–	–	–	NA	–	–
RE39-09-5132	39-604833	4.0–6.0	Soil	NA	–	–	–	0.014	–	–	NA	NA	–	–	–	NA	–	–
RE39-09-5133	39-604833	6.0–8.0	Soil	NA	–	–	–	0.012	–	–	NA	NA	0.17 (J)	0.2 (J)	–	NA	–	–
RE39-09-5135	39-604834	0.0–1.0	Soil	NA	–	0.078 (J)	–	0.0033 (J)	–	–	NA	NA	0.15 (J)	0.27 (J)	–	NA	–	–
RE39-09-5137	39-604834	2.0–4.0	Soil	NA	–	–	–	0.0036 (J)	–	–	NA	NA	–	–	–	NA	–	–
RE39-09-5138	39-604834	4.0–6.0	Soil	NA	–	–	–	–	–	–	NA	NA	–	0.048 (J)	–	NA	–	–
RE39-09-5139	39-604834	6.0–8.0	Soil	NA	–	–	–	–	–	–	NA	NA	–	–	–	NA	–	–
RE39-09-5140	39-604834	8.0–10.0	Soil	NA	–	–	–	–	–	–	NA	NA	–	–	0.0094 (J)	NA	–	–
RE39-09-5141	39-604835	0.0–1.0	Soil	NA	–	0.24 (J)	–	0.0026 (J)	–	0.13 (J)	NA	NA	1.3	1.3	–	NA	–	–
RE39-09-5142	39-604835	1.0–2.0	Soil	NA	–	0.11 (J)	–	0.0039 (J)	–	–	NA	NA	0.27 (J)	0.39	–	NA	–	–
RE39-09-5143	39-604835	2.0–4.0	Soil	NA	–	–	–	0.0034 (J)	–	–	NA	NA	0.073 (J)	0.12 (J)	–	NA	–	–
RE39-09-5144	39-604835	4.0–6.0	Qbo	NA	–	0.12 (J)	–	–	–	0.065 (J)	NA	NA	0.58	0.6	–	NA	–	–
RE39-09-5145	39-604835	6.0–8.0	Qbo	NA	–	0.07 (J)	–	0.0029 (J)	–	–	NA	NA	0.3 (J)	0.32 (J)	–	NA	–	–
RE39-09-5146	39-604835	8.0–10.0	Qbo	NA	–	0.059 (J)	–	0.0045 (J)	–	–	NA	NA	0.18 (J)	0.19 (J)	–	NA	–	–
RE39-09-5147	39-604836	0.0–1.0	Soil	NA	–	0.22 (J)	0.028 (J)	–	–	–	NA	NA	0.46	0.71	–	NA	–	–
RE39-09-5148	39-604836	1.0–2.0	Soil	NA	–	0.25 (J)	0.00038 (J)	–	–	0.067 (J)	NA	NA	0.87	1.1	–	NA	–	–
RE39-09-5149	39-604836	2.0–4.0	Soil	NA	–	0.099 (J)	–	–	–	–	NA	NA	0.29 (J)	0.41	–	NA	–	–
RE39-09-5150	39-604836	4.0–6.0	Soil	NA	–	–	–	–	–	–	NA	NA	0.061 (J)	0.11 (J)	–	NA	–	–
RE39-09-5151	39-604836	6.0–8.0	Soil	NA	–	–	–	–	–	–	NA	NA	0.062 (J)	0.11 (J)	–	NA	–	0.01 (J)
RE39-09-5152	39-604836	8.0–10.0	Soil	NA	–	–	–	0.0044 (J)	–	–	NA	NA	0.064 (J)	0.1 (J)	–	NA	0.01 (J)	0.009 (J)
RE39-09-5153	39-604837	0.0–1.0	Soil	NA	–	0.34 (J)	–	–	–	0.12 (J)	NA	NA	1.4	1.7	–	NA	–	–
RE39-09-5154	39-604837	1.0–2.0	Soil	NA	–	–	–	–	–	–	NA	NA	–	0.041 (J)	–	NA	–	–

Table 5.11-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Phenanthrene	Pyrene	RDX	Tetrachlorodibenzodioxin[2,3,7,8-]	Trinitrobenzene[1,3,5-]	Trinitrotoluene[2,4,6-]
RE39-09-5155	39-604837	2.0–4.0	Soil	NA	–	–	–	–	–	–	NA	NA	–	0.039 (J)	–	NA	–	–
RE39-09-5157	39-604837	6.0–8.0	Soil	NA	–	–	–	–	–	–	NA	NA	0.07 (J)	0.1 (J)	–	NA	–	–
RE39-09-5158	39-604837	8.0–10.0	Qbo	NA	–	–	–	–	–	–	NA	NA	0.073 (J)	0.094 (J)	–	NA	–	–
RE39-09-5159	39-604838	0.0–1.0	Soil	NA	–	0.52	–	–	0.068 (J)	0.28 (J)	NA	NA	2.2	3.1	–	NA	–	–
RE39-09-5160	39-604838	1.0–2.0	Qbo	NA	–	0.22 (J-)	–	–	–	0.07 (J-)	NA	NA	0.7 (J-)	0.92 (J-)	–	NA	–	–
RE39-09-5161	39-604838	2.0–4.0	Qbo	NA	–	0.12 (J)	–	–	–	0.072 (J)	NA	NA	0.56	0.74	–	NA	–	–
RE39-09-5162	39-604838	4.0–6.0	Qbo	NA	–	0.071 (J)	–	–	–	–	NA	NA	0.29 (J)	0.32 (J)	–	NA	–	–
RE39-09-5165	39-604839	0.0–1.0	Soil	NA	–	–	–	–	–	–	NA	NA	–	0.064 (J)	–	NA	–	–
RE39-09-5168	39-604839	4.0–6.0	Soil	NA	–	–	–	–	–	–	NA	NA	–	–	–	NA	–	–
RE39-09-5169	39-604839	6.0–8.0	Soil	NA	–	–	–	–	–	–	NA	NA	–	–	–	NA	–	–

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] – = If analyzed, sample result is not detected.

[b] NA = Not analyzed.

Table 5.11-4
Summary of Radionuclides Detected or Detected above BVs/FVs at SWMU 39-005

Sample ID	Location ID	Depth (ft)	Media	Cesium-137[a]	Plutonium-238[a]	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Soil Background Value				**1.65**	**0.023**	**na**[b]	**2.59**	**0.2**	**2.29**
Qbo Background Value				**na**	**na**	**na**	**4.00**	**0.18**	**3.90**
RE39-09-5128	39-604832	8.0–10.0	Soil	–[c]	–	–	–	0.202	–
RE39-09-5129	39-604833	0.0–1.0	Soil	–	–	–	–	0.234	–
RE39-09-5133	39-604833	6.0–8.0	Soil	–	–	–	2.65	–	2.36
RE39-09-5134	39-604833	8.0–10.0	Soil	–	–	–	3.12	0.282	3.09
RE39-09-5136	39-604834	1.0–2.0	Soil	–	0.0296	–	–	–	–
RE39-09-5137	39-604834	2.0–4.0	Soil	–	0.0343	–	–	–	–
RE39-09-5141	39-604835	0.0–1.0	Soil	–	0.0293	–	–	–	–
RE39-09-5142	39-604835	1.0–2.0	Soil	–	0.0316	–	–	–	–
RE39-09-5143	39-604835	2.0–4.0	Soil	–	0.042	–	–	–	–
RE39-09-5144	39-604835	4.0–6.0	Qbo	–	0.034	–	–	–	–
RE39-09-5147	39-604836	0.0–1.0	Soil	0.2	0.038	–	–	–	3.24
RE39-09-5151	39-604836	6.0–8.0	Soil	–	–	0.5	–	–	–
RE39-09-5153	39-604837	0.0–1.0	Soil	–	–	0.65	–	–	–
RE39-09-5155	39-604837	2.0–4.0	Soil	–	–	–	–	0.203	–
RE39-09-5159	39-604838	0.0–1.0	Soil	0.15	–	–	–	–	–
RE39-09-5162	39-604838	4.0–6.0	Qbo	–	–	–	–	0.181	–

Source: BVs/FVs from LANL (1998, 059730).

Notes: Units are pCi/g.

[a] Applies only to samples from 0 to 1 ft bgs.

[b] na = Not available.

[c] – = If analyzed, sample result is less than BV/FV. If no BV/FV is available, analyte was not detected.

Table 5.11-5
Summary of COPCs for SWMU 39-005

Soil	Qbo
Inorganic COPCs	
Calcium	Antimony
Cyanide	Arsenic
Mercury	Chromium
Nitrate	Copper
Zinc	Cyanide
	Nickel
	Nitrate
	Selenium

Table 5.11-5 (continued)

Soil	Qbo
Organic COPCs	
3,5-Dinitroaniline	Acenaphthene
Acenaphthene	Acetone
Acetone	Anthracene
Amino-2,6-dinitrotoluene[4-]	Aroclor-1254
Amino-4,6-dinitrotoluene[2-]	Benzo(a)anthracene
Anthracene	Benzo(a)pyrene
Benzo(a)anthracene	Benzo(b)fluoranthene
Benzo(a)pyrene	Benzo(g,h,i)perylene
Benzo(b)fluoranthene	Benzo(k)fluoranthene
Benzo(g,h,i)perylene	Chrysene
Benzo(k)fluoranthene	Dibenzofuran
Bromomethane	Fluoranthene
Chrysene	Fluorene
Dibenzofuran	Indeno(1,2,3-cd)pyrene
Fluoranthene	Methylene Chloride
Fluorene	Naphthalene
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Phenanthrene
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Pyrene
Hexanone[2-]	
Indeno(1,2,3-cd)pyrene	
Isopropyltoluene[4-]	
Methylene Chloride	
Methylnaphthalene[2-]	
Naphthalene	
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	
Phenanthrene	
Pyrene	
RDX	
Tetrachlorodibenzodioxin[2,3,7,8-]	
Trinitrobenzene[1,3,5-]	
Trinitrotoluene[2,4,6-]	
Radionuclide COPCs	
Plutonium-238	Plutonium-238
Tritium	Uranium-235/236
Uranium-234	
Uranium-235/236	
Uranium-238	

Table 5.12-1
Summary of Samples Collected and Analyses Requested for SWMU 39-006(a) Active Component

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-4944	39-604771	0.0–1.0	Soil	X[a]	X	–[b]	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4945	39-604771	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4946	39-604772	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4947	39-604772	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4948	39-604773	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4949	39-604773	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-9771	39-604891	3.0–5.0	Soil	–	–	X	–	–	–	–	–	–	–	–	–	–	–

[a] X = Analysis was performed.

[b] – = Analysis not requested.

Table 5.12-2
Summary of Inorganic Chemicals above BVs at SWMU 39-006(a) Active Components

Sample ID	Location ID	Depth (ft)	Media	Mercury	Nitrate
Soil Background Value				**0.1**	**na**[a]
RE39-09-4944	39-604771	0.0–1.0	Soil	–[b]	1.5
RE39-09-4945	39-604771	1.0–2.0	Soil	–	0.56
RE39-09-4946	39-604772	0.0–1.0	Soil	0.669	5.7
RE39-09-4947	39-604772	1.0–2.0	Soil	–	2.3
RE39-09-4948	39-604773	0.0–1.0	Soil	–	6.8
RE39-09-4949	39-604773	1.0–2.0	Soil	–	2

Source: BVs from LANL (1998, 059730).

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] na = Not available.

[b] – = If analyzed, sample result is less than the BV.

Table 5.12-3
Summary of Organic Chemicals Detected at SWMU 39-006(a) Active Components

Sample ID	Location ID	Depth (ft)	Media	Amino-2,6-dinitrotoluene[4-]	Bis(2-ethylhexyl)phthalate	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
RE39-09-4944	39-604771	0.0–1.0	Soil	–[a]	0.11 (J)	NA[b]	NA	NA	NA
RE39-09-4945	39-604771	1.0–2.0	Soil	0.0059 (J-)	0.094 (J)	NA	NA	NA	NA
RE39-09-4947	39-604772	1.0–2.0	Soil	–	0.051 (J)	NA	NA	NA	NA
RE39-09-4948	39-604773	0.0–1.0	Soil	–	0.076 (J)	NA	NA	NA	NA
RE39-09-4949	39-604773	1.0–2.0	Soil	–	0.064 (J)	NA	NA	NA	NA
RE39-09-9771	39-604891	3.0–5.0	Soil	NA	NA	0.00000146 (J)	0.000000245 (J)	0.00000763 (J)	0.000000587 (J)

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] – = If analyzed, sample result is not detected.

[b] NA = Not analyzed.

Table 5.12-4
Summary of COPCs for
SWMU 39-006(a) Septic System Active Components

Soil
Inorganic COPCs
Mercury
Nitrate
Organic COPCs
Amino-2,6-dinitrotoluene[4-]
Bis(2-ethylhexyl)phthalate
Radionuclide COPCs
Cesium-137

Table 5.13-1
Summary of Samples Collected and Analyses Requested for SWMU 39-007(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RC39-01-0001	39-10018	0.0–0.5	Fill	–[a]	–	–	–	–	–	–	–	X[b]	X	–	–	–	–
RC39-01-0002	39-10019	0.0–0.5	Fill	–	–	–	–	–	–	–	–	X	X	–	–	–	–
RC39-01-0003	39-10020	0.0–0.5	Fill	–	–	–	–	–	–	–	–	X	X	–	–	–	–
RC39-01-0005	39-10022	0.0–0.5	Fill	–	–	–	–	–	–	–	–	X	X	–	–	–	–
RE39-09-5326	39-604852	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5327	39-604852	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5328	39-604852	2.0–3.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5386	39-604852	2.0–3.0	Soil	–	–	X	–	X	–	–	–	–	–	–	–	–	–
RE39-09-5329	39-604853	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5330	39-604853	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5331	39-604853	2.0–3.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5332	39-604854	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5333	39-604854	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5334	39-604854	2.0–3.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5335	39-604855	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5336	39-604855	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5337	39-604855	2.0–3.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5338	39-604856	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5339	39-604856	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5340	39-604856	2.0–3.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5341	39-604857	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X

Table 5.13-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-5342	39-604857	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5343	39-604857	2.0–3.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5344	39-604858	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5345	39-604858	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5346	39-604858	2.0–3.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5347	39-604859	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5350	39-604860	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-5353	39-604861	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X

[a] – = Analysis not requested.

[b] X = Analysis was performed.

Table 5.13-2
Summary of Inorganic Chemicals above BVs at SWMU 39-007(a)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Cyanide (Total)	Nitrate	Perchlorate	Zinc
Soil and Fill Background Value				**0.83**	**0.4**	**0.5**	**na**[a]	**na**	**48.8**
RC39-01-0001	39-10018	0.0–0.5	Fill	–[b]	–	NA[c]	NA	NA	57.6
RC39-01-0002	39-10019	0.0–0.5	Fill	–	–	NA	NA	NA	51.6
RE39-09-5326	39-604852	0.0–1.0	Soil	–	0.591	–	–	–	56
RE39-09-5327	39-604852	1.0–2.0	Soil	1.07 (U)	0.533 (U)	–	–	–	–
RE39-09-5328	39-604852	2.0–3.0	Soil	1.04 (U)	0.522 (U)	–	–	–	–
RE39-09-5329	39-604853	0.0–1.0	Soil	1.16 (U)	0.58 (U)	–	–	–	–
RE39-09-5330	39-604853	1.0–2.0	Soil	1.14 (U)	0.57 (U)	–	–	–	–
RE39-09-5331	39-604853	2.0–3.0	Soil	1.04 (U)	0.519 (U)	–	–	–	–
RE39-09-5332	39-604854	0.0–1.0	Soil	1.13 (U)	–	–	–	–	–
RE39-09-5333	39-604854	1.0–2.0	Soil	1.09 (U)	0.546 (U)	–	–	–	–
RE39-09-5334	39-604854	2.0–3.0	Soil	1.06 (U)	0.531 (U)	–	–	–	–
RE39-09-5335	39-604855	0.0–1.0	Soil	–	0.547 (U)	–	3.57	–	–
RE39-09-5336	39-604855	1.0–2.0	Soil	1.03 (U)	0.516 (U)	–	0.879 (J)	–	–
RE39-09-5337	39-604855	2.0–3.0	Soil	1.04 (U)	0.522 (U)	–	–	–	–
RE39-09-5338	39-604856	0.0–1.0	Soil	–	0.575 (U)	–	1.38	–	–
RE39-09-5339	39-604856	1.0–2.0	Soil	1.06 (U)	0.53 (U)	–	–	–	–
RE39-09-5340	39-604856	2.0–3.0	Soil	1.06 (U)	0.53 (U)	–	–	0.000567 (J)	–
RE39-09-5341	39-604857	0.0–1.0	Soil	–	–	0.69 (UJ)	–	–	108
RE39-09-5342	39-604857	1.0–2.0	Soil	–	–	–	–	–	54.5
RE39-09-5343	39-604857	2.0–3.0	Soil	–	–	0.59 (UJ)	–	–	–
RE39-09-5346	39-604858	2.0–3.0	Soil	–	–	0.54 (UJ)	–	–	–
RE39-09-5347	39-604859	0.0–1.0	Soil	1.2 (U)	–	–	–	–	–
RE39-09-5350	39-604860	1.0–2.0	Soil	–	–	–	–	0.000585 (J)	–

Source: BVs from LANL (1998, 059730).

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] na = Not available.

[b] – = If analyzed, sample result is less than the BV.

[c] NA = Not analyzed.

Table 5.13-3
Summary of Organic Chemicals Detected at SWMU 39-007(a)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Chrysene	Dichlorobenzene[1,4-]	Ethylbenzene	Fluoranthene	Isopropylbenzene	Isopropyltoluene[4-]	Phenanthrene	Pyrene	Toluene
RC39-01-0001	39-10018	0.0–0.5	Fill	NA[a]	–[b]	–	–	0.032 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RC39-01-0002	39-10019	0.0–0.5	Fill	NA	–	–	3	–	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RC39-01-0003	39-10020	0.0–0.5	Fill	NA	–	–	–	0.086	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RC39-01-0005	39-10022	0.0–0.5	Fill	NA	–	–	–	0.036	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE39-09-5326	39-604852	0.0–1.0	Soil	–	–	–	0.0438	0.0228	–	0.189 (J)	–	–	–	–	–	–	–	–	–	–
RE39-09-5327	39-604852	1.0–2.0	Soil	–	–	–	0.0094	0.0046	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-5328	39-604852	2.0–3.0	Soil	0.0103 (J)	–	–	–	–	–	0.163 (J)	–	–	–	–	–	–	–	–	–	–
RE39-09-5329	39-604853	0.0–1.0	Soil	–	–	–	0.0039 (J)	0.0033 (J)	–	0.0872 (J)	–	–	–	–	–	–	–	–	–	–
RE39-09-5330	39-604853	1.0–2.0	Soil	–	–	0.202	–	0.0269 (J)	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-5331	39-604853	2.0–3.0	Soil	–	–	0.00806	0.00605	0.00308 (J)	–	0.18 (J)	–	–	–	–	–	–	–	–	–	–
RE39-09-5332	39-604854	0.0–1.0	Soil	–	–	–	24.6	7.82	–	0.268 (J)	–	–	–	–	–	–	–	–	–	–
RE39-09-5333	39-604854	1.0–2.0	Soil	0.0346 (J)	–	–	1.26	0.404	–	0.0972 (J)	–	–	–	–	–	0.000786 (J)	0.000467 (J)	–	–	0.000633 (J)
RE39-09-5334	39-604854	2.0–3.0	Soil	–	–	–	0.268	0.089	–	0.11 (J)	–	–	–	–	–	–	–	–	–	–
RE39-09-5335	39-604855	0.0–1.0	Soil	–	–	–	0.0404	0.0361	–	0.225 (J)	–	–	–	–	–	–	–	–	–	–
RE39-09-5336	39-604855	1.0–2.0	Soil	–	–	–	–	0.0022 (J)	–	0.159 (J)	–	–	–	–	–	–	–	–	–	–
RE39-09-5337	39-604855	2.0–3.0	Soil	–	–	–	–	–	–	0.155 (J)	–	–	–	–	–	–	–	–	–	–
RE39-09-5338	39-604856	0.0–1.0	Soil	–	–	–	0.0341	0.0212	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-5339	39-604856	1.0–2.0	Soil	–	–	–	0.0024 (J)	0.0016 (J)	–	0.21 (J)	–	–	–	–	–	–	–	–	–	–
RE39-09-5340	39-604856	2.0–3.0	Soil	–	–	–	0.0026 (J)	0.0015 (J)	–	0.163 (J)	–	–	–	–	–	–	–	–	–	–
RE39-09-5341	39-604857	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	0.00059 (J)	0.00043 (J)	–	–	–	–	–	0.00095 (J)
RE39-09-5344	39-604858	0.0–1.0	Soil	–	–	–	–	–	–	–	0.077 (J)	–	0.00074 (J)	0.00043 (J)	–	–	–	–	–	0.00041 (J)
RE39-09-5345	39-604858	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	0.00033 (J)	–	–	–	–	–	–
RE39-09-5347	39-604859	0.0–1.0	Soil	–	–	–	0.4 (J)	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-5350	39-604860	1.0–2.0	Soil	–	0.24 (J)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-5353	39-604861	0.0–1.0	Soil	–	–	0.35 (J)	0.26 (J)	–	0.042 (J)	–	–	0.04 (J)	–	–	0.076 (J)	–	–	0.067 (J)	0.08 (J)	–

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] NA = Not analyzed.

[b] – = If analyzed, sample result is not detected.

Table 5.13-4
Summary of COPCs for SWMU 39-007(a)

Soil and Fill
Inorganic COPCs
Antimony
Cadmium
Zinc
Cyanide
Nitrate
Perchlorate
Organic COPCs
Acetone
Aroclor-1242
Aroclor-1248
Aroclor-1254
Aroclor-1260
Benzo(k)fluoranthene
Bis(2-ethylhexy)phthalate
Butylbenzylphthalate
Chrysene
Dichlorobenzene[1,4-]
Ethylbenzene
Fluoranthene
Isopropylbenzene
Isopropyltoluene[4-]
Phenanthrene
Pyrene
Toluene
Radionuclide COPCs
None

Table 5.14-1
Summary of Samples Collected and Analyses Requested for AOC 39-007(d)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-4137	39-604683	0.25–1.25	Soil	X*	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4138	39-604683	1.25–2.25	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4139	39-604684	0.0–1.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4140	39-604684	1.0–2.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4141	39-604685	0.0–1.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4142	39-604685	1.0–2.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4143	39-604686	0.0–1.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4144	39-604686	1.0–2.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4145	39-604687	0.0–1.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4146	39-604687	1.0–2.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4147	39-604688	0.0–1.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4148	39-604688	1.0–2.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4149	39-604689	0.0–1.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4150	39-604689	1.0–2.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4151	39-604690	0.0–1.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4152	39-604690	1.0–2.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4153	39-604691	0.0–1.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4154	39-604691	1.0–2.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4155	39-604692	0.0–1.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4156	39-604692	1.0–2.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4157	39-604693	0.0–1.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4158	39-604693	1.0–2.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 5.14-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-4159	39-604694	0.5–1.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4160	39-604694	1.0–2.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4161	39-604695	0.5–1.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4162	39-604695	1.0–2.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4163	39-604696	0.5–1.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4164	39-604696	1.0–2.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4165	39-604697	0.5–1.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4166	39-604697	1.0–2.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4167	39-604698	0.5–1.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4168	39-604698	1.0–2.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4169	39-604699	0.5–1.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4170	39-604699	1.0–2.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4171	39-604700	0.5–1.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4172	39-604700	1.0–2.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4173	39-604701	0.5–1.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-4174	39-604701	1.0–2.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X

*X = Analysis was performed.

Table 5.14-2
Summary of Inorganic Chemicals above BVs at AOC 39-007(d)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Calcium	Chromium	Cyanide (Total)	Nitrate	Perchlorate	Zinc
Soil Background Value				**0.83**	**0.4**	**6120**	**19.3**	**0.5**	**na**[a]	**na**	**48.8**
RE39-09-4137	39-604683	0.25–1.25	Soil	–[b]	–	–	–	–	–	–	55.8 (J+)
RE39-09-4138	39-604683	1.25–2.25	Soil	–	–	–	–	0.51 (U)	–	–	–
RE39-09-4139	39-604684	0.0–1.0	Soil	–	–	–	–	0.57 (U)	15.3	–	–
RE39-09-4140	39-604684	1.0–2.0	Soil	–	–	–	–	0.75 (U)	12.7	–	–
RE39-09-4143	39-604686	0.0–1.0	Soil	–	0.42 (J+)	8990 (J-)	–	0.52 (U)	–	–	–
RE39-09-4145	39-604687	0.0–1.0	Soil	–	–	–	–	–	1.9	–	–
RE39-09-4146	39-604687	1.0–2.0	Soil	–	–	–	–	–	0.22 (J)	0.0048 (J)	–
RE39-09-4147	39-604688	0.0–1.0	Soil	–	–	–	–	–	0.27	–	–
RE39-09-4149	39-604689	0.0–1.0	Soil	–	0.47 (J+)	–	–	–	1.3	–	–
RE39-09-4150	39-604689	1.0–2.0	Soil	–	–	–	–	0.98 (U)	0.087 (J)	–	–
RE39-09-4151	39-604690	0.0–1.0	Soil	–	–	–	–	–	0.24 (J)	–	70.8 (J+)
RE39-09-4152	39-604690	1.0–2.0	Soil	–	–	–	–	0.53 (U)	–	–	–
RE39-09-4153	39-604691	0.0–1.0	Soil	1.09 (U)	0.543 (U)	–	–	–	–	–	–
RE39-09-4154	39-604691	1.0–2.0	Soil	1.12 (U)	0.558 (U)	–	–	–	–	–	–
RE39-09-4155	39-604692	0.0–1.0	Soil	1.14 (U)	0.572 (U)	–	–	–	–	–	–
RE39-09-4156	39-604692	1.0–2.0	Soil	1.2 (U)	0.599 (U)	–	–	–	–	–	–
RE39-09-4157	39-604693	0.0–1.0	Soil	1.08 (U)	–	–	–	–	–	–	–
RE39-09-4158	39-604693	1.0–2.0	Soil	1.14 (U)	0.571 (U)	–	–	–	–	–	–
RE39-09-4159	39-604694	0.5–1.0	Soil	1.12 (U)	0.558 (U)	–	–	–	0.743 (J)	–	–
RE39-09-4160	39-604694	1.0–2.0	Soil	1.11 (U)	0.557 (U)	–	–	–	0.724 (J)	–	–
RE39-09-4161	39-604695	0.5–1.0	Soil	1.1 (U)	0.55 (U)	–	–	–	–	–	–
RE39-09-4162	39-604695	1.0–2.0	Soil	1.14 (U)	0.571 (U)	–	–	–	2.18	–	–

Table 5.14-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Calcium	Chromium	Cyanide (Total)	Nitrate	Perchlorate	Zinc
Soil Background Value				**0.83**	**0.4**	**6120**	**19.3**	**0.5**	**na**[a]	**na**	**48.8**
RE39-09-4163	39-604696	0.5–1.0	Soil	1.14 (U)	0.569 (U)	6440	–	–	0.847 (J)	–	–
RE39-09-4164	39-604696	1.0–2.0	Soil	1.13 (U)	0.564 (U)	–	–	–	1.13 (J)	–	–
RE39-09-4165	39-604697	0.5–1.0	Soil	1.06 (U)	0.532 (U)	6960	–	–	–	–	–
RE39-09-4166	39-604697	1.0–2.0	Soil	1.1 (U)	0.548 (U)	–	–	–	1.16	–	–
RE39-09-4167	39-604698	0.5–1.0	Soil	1.03 (U)	–	13000	–	–	–	–	–
RE39-09-4168	39-604698	1.0–2.0	Soil	1.06 (U)	0.53 (U)	–	–	–	–	–	–
RE39-09-4169	39-604699	0.5–1.0	Soil	1.07 (U)	0.533 (U)	11900	–	–	0.633 (J)	–	–
RE39-09-4170	39-604699	1.0–2.0	Soil	1.12 (U)	0.561 (U)	–	–	–	0.842 (J)	–	–
RE39-09-4171	39-604700	0.5–1.0	Soil	1.08 (U)	0.541 (U)	11900	20.5	–	0.859 (J)	–	–
RE39-09-4172	39-604700	1.0–2.0	Soil	1.15 (U)	0.573 (U)	–	–	–	1.03 (J)	–	–
RE39-09-4173	39-604701	0.5–1.0	Soil	1.05 (U)	0.524 (U)	11600	24.1	–	2.55	–	–
RE39-09-4174	39-604701	1.0–2.0	Soil	1.1 (U)	0.551 (U)	–	–	–	1.47	–	–

Source: BVs from LANL (1998, 059730).

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] na = Not available.

[b] – = If analyzed, sample result is less than the BV.

Table 5.14-3
Summary of Organic Chemicals Detected at AOC 39-007(d)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Anthracene	Aroclor-1242	Aroclor-1254	Benzo(a)pyrene	Bis(2-ethylhexyl)phthalate	Bromomethane	Diphenylamine	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]
RE39-09-4137	39-604683	0.25–1.25	Soil	–[a]	–	–	–	–	–	–	NA[b]	–	0.00000159 (J)	0.00000025 (J)	–	–	–
RE39-09-4138	39-604683	1.25–2.25	Soil	–	–	–	–	–	0.18 (J)	–	NA	–	0.000000722 (J)	–	–	–	–
RE39-09-4139	39-604684	0.0–1.0	Soil	–	–	–	–	–	0.25 (J)	–	NA	–	–	–	–	–	–
RE39-09-4140	39-604684	1.0–2.0	Soil	–	–	–	–	–	0.071 (J)	–	NA	–	–	–	–	–	–
RE39-09-4141	39-604685	0.0–1.0	Soil	–	–	–	–	–	–	–	NA	–	0.000000682 (J)	0.000000143 (J)	–	–	–
RE39-09-4142	39-604685	1.0–2.0	Soil	–	–	–	–	–	0.075 (J)	–	NA	–	0.000000205 (J)	–	–	–	–
RE39-09-4143	39-604686	0.0–1.0	Soil	0.01 (J-)	–	–	–	–	0.35 (J)	–	NA	–	0.00000443	0.000000893 (J)	–	–	0.000000199 (J)
RE39-09-4144	39-604686	1.0–2.0	Soil	–	–	–	–	–	–	–	NA	–	0.00000103 (J)	–	–	–	–
RE39-09-4145	39-604687	0.0–1.0	Soil	0.0056 (J)	–	–	–	–	0.14 (J)	–	NA	–	0.00000311	0.000000444 (J)	–	–	–
RE39-09-4146	39-604687	1.0–2.0	Soil	–	–	–	–	–	0.29 (J)	–	NA	–	0.000000673 (J)	–	–	–	–
RE39-09-4147	39-604688	0.0–1.0	Soil	–	–	–	–	–	0.069 (J)	–	NA	–	0.000000794 (J)	–	–	–	–
RE39-09-4148	39-604688	1.0–2.0	Soil	–	–	–	–	–	0.53	–	NA	–	0.000000276 (J)	–	–	–	–
RE39-09-4149	39-604689	0.0–1.0	Soil	0.0082 (J-)	–	–	–	–	–	–	NA	–	–	–	–	–	–
RE39-09-4150	39-604689	1.0–2.0	Soil	0.003 (J)	–	–	–	–	–	0.00067 (J)	NA	–	–	–	–	–	–
RE39-09-4151	39-604690	0.0–1.0	Soil	–	–	–	–	–	–	–	NA	–	0.00000851	0.00000212 (J)	–	–	–
RE39-09-4152	39-604690	1.0–2.0	Soil	0.0035 (J)	–	–	–	–	–	–	NA	–	0.000000586 (J)	0.000000166 (J)	–	–	–
RE39-09-4153	39-604691	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	0.00000233 (J)	–	–	–	–
RE39-09-4154	39-604691	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	0.000000711 (J)	–	–	–	–
RE39-09-4155	39-604692	0.0–1.0	Soil	–	–	–	0.0021 (J)	–	–	–	–	–	0.000000911 (J)	–	–	–	–
RE39-09-4156	39-604692	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	0.000000244 (J)	–	–	–	–
RE39-09-4157	39-604693	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	0.00000357	–	–	0.0000000818 (J)	0.000000184 (J)
RE39-09-4158	39-604693	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	0.000000357 (J)	–	–	–	–
RE39-09-4159	39-604694	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	0.000000617 (J)	–	–	–	–
RE39-09-4160	39-604694	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-4161	39-604695	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	0.000000373 (J)	–	–	–	–
RE39-09-4162	39-604695	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	0.00000017 (J)	–	–	–	–
RE39-09-4163	39-604696	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	0.000000731 (J)	–	–	–	–

Table 5.14-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Anthracene	Aroclor-1242	Aroclor-1254	Benzo(a)pyrene	Bis(2-ethylhexyl)phthalate	Bromomethane	Diphenylamine	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]
RE39-09-4164	39-604696	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	0.00000016 (J)	–	–	–	–
RE39-09-4165	39-604697	0.5–1.0	Soil	–	–	–	–	0.0149 (J)	–	–	–	–	0.000000565 (J)	–	–	–	–
RE39-09-4166	39-604697	1.0–2.0	Soil	–	–	0.418	0.222	–	–	–	–	–	0.000000239 (J)	–	–	–	–
RE39-09-4167	39-604698	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-4168	39-604698	1.0–2.0	Soil	0.0507	0.183 (J)	–	–	–	–	–	1.85 (J)	0.265 (J)	0.000000348 (J)	–	–	–	–
RE39-09-4169	39-604699	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-4170	39-604699	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	0.000000268 (J)	–	–	–	–
RE39-09-4171	39-604700	0.5–1.0	Soil	–	–	–	–	–	0.232 (J)	–	–	–	0.000000361 (J)	–	–	–	–
RE39-09-4172	39-604700	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	0.000000277 (J)	–	–	–	–
RE39-09-4173	39-604701	0.5–1.0	Soil	–	–	0.66	0.382	–	–	–	–	–	–	0.000000512 (J)	0.000000336 (J)	–	–
RE39-09-4174	39-604701	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	0.000000232 (J)	–	–	–	–

Table 5.14-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)
RE39-09-4137	39-604683	0.25–1.25	Soil	–	–	–	–	–	0.0035 (J)	–	0.0000123	–	–	–	6.21E-08
RE39-09-4138	39-604683	1.25–2.25	Soil	–	–	–	–	–	0.0028 (J)	–	0.00000501	–	–	–	–
RE39-09-4139	39-604684	0.0–1.0	Soil	–	–	–	–	–	0.0017 (J)	–	–	–	–	–	–
RE39-09-4140	39-604684	1.0–2.0	Soil	–	–	–	–	–	0.0026 (J)	–	0.000000786 (J)	–	–	–	–
RE39-09-4141	39-604685	0.0–1.0	Soil	–	–	–	–	–	0.0013 (J)	–	0.00000399 (J)	0.000000262 (J)	–	–	–
RE39-09-4142	39-604685	1.0–2.0	Soil	–	–	–	–	–	0.0027 (J)	–	0.00000126 (J)	–	–	–	–
RE39-09-4143	39-604686	0.0–1.0	Soil	–	0.000000973 (J)	0.000000162 (J)	0.00000012 (J)	–	0.0039 (J-)	–	0.0000307	0.0000018 (J)	0.0000000993 (J)	0.000000141 (J)	9.95E-07
RE39-09-4144	39-604686	1.0–2.0	Soil	–	–	–	–	–	0.0028 (J)	–	0.00000726	–	–	–	–
RE39-09-4145	39-604687	0.0–1.0	Soil	–	–	–	–	–	–	–	0.0000198	0.00000101 (J)	–	–	–
RE39-09-4146	39-604687	1.0–2.0	Soil	–	–	–	–	–	–	–	0.00000356 (J)	0.000000219 (J)	–	–	7.81E-08
RE39-09-4147	39-604688	0.0–1.0	Soil	–	–	–	–	–	0.0022 (J)	–	0.00000381 (J)	0.000000269 (J)	–	–	9.85E-08
RE39-09-4148	39-604688	1.0–2.0	Soil	–	–	–	–	–	0.0023 (J)	–	0.00000132 (J)	–	–	–	–
RE39-09-4149	39-604689	0.0–1.0	Soil	–	–	–	–	–	0.0026 (J-)	–	0.00000707	0.000000322 (J)	–	–	–
RE39-09-4150	39-604689	1.0–2.0	Soil	–	–	–	–	–	0.0023 (J)	–	0.00000242 (J)	–	–	–	–
RE39-09-4151	39-604690	0.0–1.0	Soil	–	–	0.000000129 (J)	0.000000178 (J)	–	0.0018 (J)	–	0.0000801	0.00000362 (J)	–	–	2.82E-07
RE39-09-4152	39-604690	1.0–2.0	Soil	–	–	–	–	–	0.0025 (J)	–	0.00000452 (J)	0.000000234 (J)	–	–	–
RE39-09-4153	39-604691	0.0–1.0	Soil	–	–	–	0.0000000479 (J)	–	–	–	0.00002	0.00000128 (J)	–	–	8.17E-08
RE39-09-4154	39-604691	1.0–2.0	Soil	–	–	–	–	–	–	–	0.00000586	0.000000283 (J)	–	–	–
RE39-09-4155	39-604692	0.0–1.0	Soil	–	–	–	–	–	–	–	0.00000598	0.000000368 (J)	–	–	1.5E-07
RE39-09-4156	39-604692	1.0–2.0	Soil	–	–	–	–	–	0.00533 (J)	–	0.00000126 (J)	0.00000011 (J)	–	–	–
RE39-09-4157	39-604693	0.0–1.0	Soil	0.00000014 (J)	–	–	0.0000000756 (J)	–	–	–	0.0000239	0.00000128 (J)	–	–	4.66E-07
RE39-09-4158	39-604693	1.0–2.0	Soil	–	–	–	–	–	–	–	0.00000224 (J)	–	–	–	–
RE39-09-4159	39-604694	0.5–1.0	Soil	–	–	–	–	–	–	–	0.00000385 (J)	0.000000337 (J)	–	–	–
RE39-09-4160	39-604694	1.0–2.0	Soil	–	–	–	–	–	0.00249 (J)	–	0.00000106 (J)	–	–	–	–
RE39-09-4161	39-604695	0.5–1.0	Soil	–	–	–	–	–	–	–	0.00000229 (J)	0.000000139 (J)	–	–	–
RE39-09-4162	39-604695	1.0–2.0	Soil	–	–	–	–	–	0.00504 (J)	–	0.000000989 (J)	–	–	–	–
RE39-09-4163	39-604696	0.5–1.0	Soil	–	–	–	–	–	–	–	0.00000691	0.000000438 (J)	–	–	–
RE39-09-4164	39-604696	1.0–2.0	Soil	–	–	–	–	–	0.00466 (J)	–	0.000000773 (J)	–	–	–	–
RE39-09-4165	39-604697	0.5–1.0	Soil	–	–	–	–	–	–	–	0.00000325 (J)	–	–	–	–
RE39-09-4166	39-604697	1.0–2.0	Soil	–	–	–	–	–	–	–	0.00000106 (J)	–	–	–	–

Table 5.14-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)
RE39-09-4167	39-604698	0.5–1.0	Soil	–	–	–	–	0.142 (J-)	–	6.35	0.0000037 (J)	0.000000247 (J)	–	–	–
RE39-09-4168	39-604698	1.0–2.0	Soil	–	–	–	–	0.00747	–	0.287 (J)	0.00000199 (J)	–	–	–	–
RE39-09-4169	39-604699	0.5–1.0	Soil	–	–	–	–	–	0.0038 (J)	–	0.00000318 (J)	–	–	–	–
RE39-09-4170	39-604699	1.0–2.0	Soil	–	–	–	–	–	0.00509 (J)	–	0.00000206 (J)	–	–	–	–
RE39-09-4171	39-604700	0.5–1.0	Soil	–	–	–	–	–	0.00485 (J)	–	0.00000287 (J)	0.000000283 (J)	–	–	–
RE39-09-4172	39-604700	1.0–2.0	Soil	–	–	–	–	–	0.00286 (J)	–	0.00000172 (J)	–	–	–	–
RE39-09-4173	39-604701	0.5–1.0	Soil	–	–	0.000000105 (J)	0.0000000658 (J)	–	–	–	0.00000316 (J)	0.00000157 (J)	–	–	1.69E-07
RE39-09-4174	39-604701	1.0–2.0	Soil	–	–	–	–	–	–	–	0.00000154 (J)	–	–	–	–

Table 5.14-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Toluene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]
RE39-09-4137	39-604683	0.25–1.25	Soil	–	–	–	–	0.00091 (J)	–	–
RE39-09-4138	39-604683	1.25–2.25	Soil	–	–	–	–	0.0013 (J)	–	–
RE39-09-4139	39-604684	0.0–1.0	Soil	–	–	–	–	–	–	–
RE39-09-4140	39-604684	1.0–2.0	Soil	–	–	–	–	0.00042 (J)	–	–
RE39-09-4141	39-604685	0.0–1.0	Soil	–	–	–	–	0.00038 (J)	–	–
RE39-09-4142	39-604685	1.0–2.0	Soil	–	–	–	–	0.00086 (J)	–	–
RE39-09-4143	39-604686	0.0–1.0	Soil	–	–	–	–	0.00094 (J-)	–	–
RE39-09-4144	39-604686	1.0–2.0	Soil	–	–	–	–	–	–	–
RE39-09-4145	39-604687	0.0–1.0	Soil	–	–	–	–	–	–	–
RE39-09-4146	39-604687	1.0–2.0	Soil	–	–	–	–	–	–	–
RE39-09-4147	39-604688	0.0–1.0	Soil	–	–	–	–	0.00026 (J)	–	–
RE39-09-4148	39-604688	1.0–2.0	Soil	–	–	–	–	0.0013 (J)	–	–
RE39-09-4149	39-604689	0.0–1.0	Soil	–	–	–	–	–	–	–
RE39-09-4150	39-604689	1.0–2.0	Soil	–	–	–	–	0.00085 (J)	–	–
RE39-09-4151	39-604690	0.0–1.0	Soil	–	–	–	–	–	–	–
RE39-09-4152	39-604690	1.0–2.0	Soil	–	–	–	–	0.00036 (J)	–	–
RE39-09-4153	39-604691	0.0–1.0	Soil	–	–	–	–	–	–	–
RE39-09-4154	39-604691	1.0–2.0	Soil	–	–	–	–	–	–	–
RE39-09-4155	39-604692	0.0–1.0	Soil	–	–	–	–	–	–	–
RE39-09-4156	39-604692	1.0–2.0	Soil	–	–	–	–	–	–	–
RE39-09-4157	39-604693	0.0–1.0	Soil	–	–	–	–	–	–	–
RE39-09-4158	39-604693	1.0–2.0	Soil	–	–	–	–	–	–	–
RE39-09-4159	39-604694	0.5–1.0	Soil	–	–	–	–	–	–	–
RE39-09-4160	39-604694	1.0–2.0	Soil	–	–	–	–	–	–	–
RE39-09-4161	39-604695	0.5–1.0	Soil	–	–	–	–	–	–	–
RE39-09-4162	39-604695	1.0–2.0	Soil	–	–	–	–	–	–	–
RE39-09-4163	39-604696	0.5–1.0	Soil	–	–	0.000000119 (J)	–	–	–	–
RE39-09-4164	39-604696	1.0–2.0	Soil	–	–	–	–	–	–	–
RE39-09-4165	39-604697	0.5–1.0	Soil	–	0.0281 (J)	–	0.000399 (J)	–	–	–
RE39-09-4166	39-604697	1.0–2.0	Soil	–	–	–	–	–	–	–
RE39-09-4167	39-604698	0.5–1.0	Soil	5.73	1.51	–	–	–	0.203 (J-)	0.256 (J-)

Table 5.14-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Toluene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]
RE39-09-4168	39-604698	1.0–2.0	Soil	1.31	0.508	–	–	–	–	0.0116
RE39-09-4169	39-604699	0.5–1.0	Soil	–	–	–	0.000347 (J)	–	–	–
RE39-09-4170	39-604699	1.0–2.0	Soil	–	–	–	–	–	–	–
RE39-09-4171	39-604700	0.5–1.0	Soil	0.0456 (J)	0.045 (J)	–	–	–	–	–
RE39-09-4172	39-604700	1.0–2.0	Soil	–	–	–	–	–	–	–
RE39-09-4173	39-604701	0.5–1.0	Soil	–	–	–	0.00138 (J+)	–	–	–
RE39-09-4174	39-604701	1.0–2.0	Soil	–	–	–	–	–	–	–

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] – = If analyzed, sample result is not detected.

[b] NA = Not analyzed.

Table 5.14-4
Summary of Radionuclides Detected or
Detected above BVs/FVs at AOC 39-007(d)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Tritium
Soil Background Value[a]				**1.65**	**0.054**	**na**[b]
RE39-09-4139	39-604684	0.0–1.0	Soil	–[c]	0.151	–
RE39-09-4145	39-604687	0.0–1.0	Soil	–	–	–
RE39-09-4147	39-604688	0.0–1.0	Soil	–	–	–
RE39-09-4151	39-604690	0.0–1.0	Soil	–	–	–
RE39-09-4153	39-604691	0.0–1.0	Soil	–	–	–
RE39-09-4155	39-604692	0.0–1.0	Soil	–	–	–
RE39-09-4156	39-604692	1.0–2.0	Soil	0.0924	–	0.422859
RE39-09-4159	39-604694	0.5–1.0	Soil	–	–	–
RE39-09-4162	39-604695	1.0–2.0	Soil	–	–	0.040698
RE39-09-4163	39-604696	0.5–1.0	Soil	–	–	–
RE39-09-4165	39-604697	0.5–1.0	Soil	–	–	–
RE39-09-4167	39-604698	0.5–1.0	Soil	–	–	0.008868
RE39-09-4170	39-604699	1.0–2.0	Soil	–	–	0.029302
RE39-09-4173	39-604701	0.5–1.0	Soil	–	–	–

Source: BVs/FVs from LANL (1998, 059730).

Notes: Units are pCi/g. Data qualifiers are defined in Appendix A.

[a] Applies only to samples from 0 to 1 ft bgs.

[b] na = Not available.

[c] – = If analyzed, sample result is less than BV/FV. If no BV/FV is available, analyte was not detected.

Table 5.14-5
Summary of COPCs for AOC 39-007(d)

Soil
Inorganic COPCs
Antimony
Cyanide
Nitrate
Perchlorate
Organic COPCs
Acetone
Anthracene
Aroclor-1242
Aroclor-1254
Benzo(a)pyrene
Bis(2-ethylhexyl)phthalate
Bromomethane
Diphenylamine
Fluorene
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]
Hexachlorodibenzodioxin[1,2,3,4,7,8-]
Hexachlorodibenzodioxin[1,2,3,6,7,8-]
Hexachlorodibenzodioxin[1,2,3,7,8,9-]
Hexachlorodibenzofuran[1,2,3,4,7,8-]
Hexachlorodibenzofuran[1,2,3,6,7,8-]
Hexachlorodibenzofuran[2,3,4,6,7,8-]
Isopropyltoluene[4-]
Methylene Chloride
Methylnaphthalene[2-]
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
Pentachlorodibenzofuran[1,2,3,7,8-]
Pentachlorodibenzofuran[2,3,4,7,8-]
Phenanthrene
Pyrene
Tetrachlorodibenzodioxin[2,3,7,8-]
Toluene
Trichlorofluoromethane
Trimethylbenzene[1,2,4-]
Trimethylbenzene[1,3,5-]
Radionuclide COPCs
Cesium-137
Plutonium-239/240
Tritium

Table 5.15-1
Summary of Samples Collected and Analyses Requested for SWMU 39-008

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	Uranium	VOCs	pH + Cyanide
0239-95-0204	39-01347	0.0–0.5	Soil	–[a]	–	–	X[b]	–	–	X	X	–	X	–	–	X	X	–	X
0239-95-0205	39-01347	0.5–0.83	Soil	–	–	–	X	–	–	X	X	–	X	–	–	X	X	–	X
0239-95-0206	39-01348	0.0–0.5	Soil	–	–	–	X	–	–	X	X	–	X	–	–	X	X	–	X
0239-95-0207	39-01348	0.5–0.83	Soil	–	–	–	X	–	–	X	X	–	X	–	–	X	X	–	X
0239-95-0208	39-01349	0.0–0.5	Soil	–	–	–	X	–	X	X	X	–	X	–	–	X	–	–	X
0239-95-0210	39-01349	0.5–0.83	Soil	–	–	–	X	–	X	X	X	–	X	–	–	X	X	–	X
0239-95-0211	39-01350	0.0–0.5	Soil	–	–	–	X	–	–	X	X	–	X	–	–	X	X	–	X
0239-95-0212	39-01350	0.5–0.83	Soil	–	–	–	X	–	–	X	X	–	X	–	–	X	X	–	X
0239-95-0213	39-01351	0.0–0.5	Soil	–	–	–	X	–	–	X	X	–	X	–	–	X	X	–	X
0239-95-0214	39-01351	0.5–0.83	Soil	–	–	–	X	–	–	X	X	–	X	–	–	X	X	–	X
0239-95-0215	39-01352	0.0–0.5	Soil	–	–	–	X	–	–	X	X	–	X	–	–	X	–	–	X
0239-95-0216	39-01352	0.5–0.83	Soil	–	–	–	X	–	–	X	X	–	X	–	–	X	–	–	X
0239-95-0219	39-01355	0.0–0.5	Soil	–	–	–	X	–	–	X	X	–	X	–	–	X	–	–	X
0239-95-0221	39-01355	5.5–6.0	Soil	–	–	–	X	–	–	X	X	–	X	–	–	X	–	–	X
0239-95-0222	39-01356	0.0–0.5	Soil	–	–	–	X	–	X	X	X	–	X	–	–	X	–	–	X
0239-95-0223	39-01356	6.5–7.0	Soil	–	–	–	X	–	X	X	X	–	X	–	–	X	–	–	X
0239-95-0225	39-01357	0.0–0.5	Soil	–	–	–	X	–	–	X	X	–	X	–	–	X	–	–	X
0239-95-0227	39-01357	3.0–3.5	Soil	–	–	–	X	–	–	X	X	–	X	–	–	X	–	–	X
0239-95-0228	39-01358	0.0–0.5	Soil	–	–	–	X	–	–	X	X	–	X	–	–	X	–	–	X
0239-95-0230	39-01358	4.5–5.0	Soil	–	–	–	X	–	–	X	X	–	X	–	–	X	–	–	X
0239-95-0231	39-01359	0.0–0.17	Soil	–	–	–	X	–	–	X	X	–	X	–	–	X	–	–	X
RE39-09-4196	39-604705	0.0–1.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	–	X
RE39-09-4197	39-604705	1.0–2.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	X	X

Table 5.15-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	Uranium	VOCs	pH + Cyanide
RE39-09-4198	39-604706	0.0–1.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	–	X
RE39-09-4199	39-604706	1.0–2.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	X	X
RE39-09-4200	39-604707	0.0–1.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	–	X
RE39-09-4201	39-604707	1.0–2.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	X	X
RE39-09-4202	39-604708	0.0–1.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	–	X
RE39-09-4203	39-604708	1.0–2.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	X	X
RE39-09-4204	39-604709	0.0–1.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	–	X
RE39-09-4205	39-604709	1.0–2.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	X	X
RE39-09-4206	39-604710	0.0–1.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	–	X
RE39-09-4207	39-604710	1.0–2.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	X	X
RE39-09-4208	39-604711	0.0–1.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	–	X
RE39-09-4209	39-604711	1.0–2.0	Qbo	X	X	X	X	X	X	X	–	X	X	X	X	X	–	X	X
RE39-09-4210	39-604712	0.0–1.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	–	X
RE39-09-4211	39-604712	1.0–2.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	X	X
RE39-09-4212	39-604713	0.0–1.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	–	X
RE39-09-4213	39-604713	1.0–2.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	X	X
RE39-09-4214	39-604714	0.0–1.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	–	X
RE39-09-4215	39-604714	1.0–2.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	X	X
RE39-09-4216	39-604715	0.0–1.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	–	X
RE39-09-4217	39-604715	1.0–2.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	X	X
RE39-09-4218	39-604716	0.0–1.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	–	X
RE39-09-4219	39-604716	1.0–2.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	X	X
RE39-09-4220	39-604717	0.0–1.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	–	X
RE39-09-4221	39-604717	1.0–2.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	X	X

Table 5.15-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	Uranium	VOCs	pH + Cyanide
RE39-09-4222	39-604718	0.0–1.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	–	X
RE39-09-4223	39-604718	1.0–2.0	Qbo	X	X	X	X	X	X	X	–	X	X	X	X	X	–	X	X
RE39-09-4224	39-604719	0.0–1.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	–	X
RE39-09-4225	39-604719	1.0–2.0	Soil	X	X	X	X	X	X	X	–	X	X	X	X	X	–	X	X

[a] – = Analysis not requested.

[b] X = Analysis was performed.

Table 5.15-2
Summary of Inorganic Chemicals above BVs at SWMU 39-008

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Selenium	Silver	Thallium	Uranium	Zinc
Qbo Background Value				**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**8.89**	**3.96**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**[a]	**0.3**	**1**	**1.22**	**0.72**	**40**
Soil Background Value				**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**1.52**	**1**	**0.73**	**1.82**	**48.8**
0239-95-0204	39-01347	0.0–0.5	Soil	–[b]	–	–	–	–	–	–	–	–	–	–	32.5	–	–	–	NA[c]	–	–	–	21	–
0239-95-0205	39-01347	0.5–0.83	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	NA	–	–	–	19.1	–
0239-95-0206	39-01348	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	NA	–	–	–	23.9	–
0239-95-0207	39-01348	0.5–0.83	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	NA	–	–	–	24.7	–
0239-95-0208	39-01349	0.0–0.5	Soil	3.2 (U)	–	–	3.7	0.84 (J)	–	111	18	–	–	–	138	–	–	–	NA	9.3	100	14.2 (U)	23330	–
0239-95-0210	39-01349	0.5–0.83	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	NA	–	2.2 (U)	–	12200	–
0239-95-0211	39-01350	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	NA	–	–	–	164	–
0239-95-0212	39-01350	0.5–0.83	Soil	–	–	–	–	–	–	–	–	–	–	–	26.7	–	–	–	NA	–	14.5	2.3 (U)	59.9	–
0239-95-0213	39-01351	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	31.6	–	–	–	NA	–	–	–	18.7	–
0239-95-0214	39-01351	0.5–0.83	Soil	–	–	–	–	–	–	–	–	–	–	–	425	–	–	–	NA	–	–	–	15.6	–
0239-95-0215	39-01352	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	584 (U)	–	–	–	0.12 (U)	–	NA	–	4.1 (J-)	1.4 (U)	1350	–
0239-95-0216	39-01352	0.5–0.83	Soil	–	–	–	–	–	–	–	–	–	0.588 (U)	–	1880	–	0.11 (U)	–	NA	–	–	1.4 (U)	385	–
0239-95-0219	39-01355	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	0.542 (U)	–	–	–	0.11 (U)	–	NA	–	–	1.3 (U)	6.1	–
0239-95-0221	39-01355	5.5–6.0	Soil	–	–	–	–	–	–	–	–	–	0.532 (U)	–	–	–	0.11 (U)	–	NA	–	–	1.3 (U)	5.6	–
0239-95-0222	39-01356	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	0.536 (U)	–	–	–	–	–	NA	–	–	1.3 (U)	6.1	–
0239-95-0223	39-01356	6.5–7.0	Soil	–	–	–	–	–	–	–	–	–	0.59	–	–	–	0.11 (U)	–	NA	–	–	1.3 (U)	6.5	–
0239-95-0225	39-01357	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	0.535 (U)	–	–	–	0.11 (U)	–	NA	–	–	1.3 (U)	6	–
0239-95-0227	39-01357	3.0–3.5	Soil	–	–	–	–	–	–	–	–	–	0.532 (U)	–	–	–	0.11 (U)	–	NA	–	–	1.3 (U)	7.6	–
0239-95-0228	39-01358	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	0.532 (U)	–	–	–	0.11 (U)	–	NA	–	–	1.3 (U)	11.1	–
0239-95-0230	39-01358	4.5–5.0	Soil	–	–	–	–	–	–	–	–	–	0.534 (U)	–	–	–	0.11 (U)	–	NA	–	–	1.3 (U)	7.1	–
0239-95-0231	39-01359	0.0–0.17	Soil	–	–	–	–	–	–	–	–	–	0.536 (U)	–	–	–	0.11 (U)	–	NA	–	–	1.2 (U)	30.5	–
RE39-09-4196	39-604705	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3.9	–	–	–	NA	–
RE39-09-4197	39-604705	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–	–	–	NA	–
RE39-09-4198	39-604706	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3.8	–	–	–	NA	–
RE39-09-4199	39-604706	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	0.57 (U)	–	–	–	–	–	1.2	–	–	–	NA	–
RE39-09-4200	39-604707	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.5	–	–	–	NA	–
RE39-09-4201	39-604707	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	0.56 (U)	–	–	–	–	–	0.71	–	–	–	NA	–
RE39-09-4202	39-604708	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	0.59 (UJ)	–	–	–	–	–	3.4	–	–	–	NA	–
RE39-09-4203	39-604708	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	0.54 (UJ)	–	–	–	–	–	1.2	–	–	–	NA	–
RE39-09-4204	39-604709	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4.7	–	–	–	NA	–
RE39-09-4205	39-604709	1.0–2.0	Soil	–	–	–	–	–	–	–	–	67.4	–	–	565	–	–	–	1.8	–	–	–	NA	–

Table 5.15-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Selenium	Silver	Thallium	Uranium	Zinc
Qbo Background Value				**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**8.89**	**3.96**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**[a]	**0.3**	**1**	**1.22**	**0.72**	**40**
Soil Background Value				**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**1.52**	**1**	**0.73**	**1.82**	**48.8**
RE39-09-4206	39-604710	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2.3	–	–	–	NA	–
RE39-09-4207	39-604710	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.64	–	–	–	NA	–
RE39-09-4208	39-604711	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3.6	–	–	–	NA	–
RE39-09-4209	39-604711	1.0–2.0	Qbo	–	0.58 (U)	37.2	–	–	–	–	–	–	–	5260	–	347	–	2.5	1.5	–	–	–	NA	48.5 (J)
RE39-09-4210	39-604712	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	7 (UJ)	–	–	–	–	–	0.33	–	–	–	NA	–
RE39-09-4211	39-604712	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.54	–	–	–	NA	–
RE39-09-4212	39-604713	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4.4	–	–	–	NA	–
RE39-09-4213	39-604713	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.8	–	–	–	NA	–
RE39-09-4214	39-604714	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.4	–	–	–	NA	–
RE39-09-4215	39-604714	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	0.56 (UJ)	–	–	–	–	–	0.64	–	–	–	NA	–
RE39-09-4216	39-604715	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.1	–	–	–	NA	–
RE39-09-4217	39-604715	1.0–2.0	Soil	–	–	–	–	–	–	–	–	22.2	–	–	–	–	–	–	0.83	–	–	–	NA	–
RE39-09-4218	39-604716	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	0.58 (UJ)	–	–	–	–	–	2.4	–	–	–	NA	–
RE39-09-4219	39-604716	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	0.58 (UJ)	–	–	–	–	–	2.3	–	–	–	NA	–
RE39-09-4220	39-604717	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3.8	–	–	–	NA	–
RE39-09-4221	39-604717	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.8	–	–	–	NA	–
RE39-09-4222	39-604718	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3.4	–	–	–	NA	–
RE39-09-4223	39-604718	1.0–2.0	Qbo	–	–	–	–	–	2580	4	–	–	–	–	–	–	–	2.1	2.9	0.55 (U)	–	–	NA	–
RE39-09-4224	39-604719	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5.1	–	–	–	NA	–
RE39-09-4225	39-604719	1.0–2.0	Soil	1.3 (J-)	–	–	–	–	–	–	–	–	0.56 (UJ)	–	–	–	–	–	1.9	–	–	–	NA	60.5 (J+)

Source: BVs from LANL (1998, 059730).

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] na = Not available.

[b] – = If analyzed, sample result is less than the BV.

[c] NA = Not analyzed.

Table 5.15-3
Summary of Organic Chemicals Detected at SWMU 39-008

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzyl Alcohol	Bis(2-ethylhexyl)phthalate	Chrysene	Di-n-butylphthalate	Dichloroethane[1,2-]	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	**Hexachlorodibenzodioxin[1,2,3,6,7,8-]**
0239-95-0205	39-01347	0.5–0.83	Soil	NA[a]	NA	–[b]	–	–	–	–	–	–	2.6	NA	–	NA	NA	NA	NA	NA
0239-95-0206	39-01348	0.0–0.5	Soil	NA	NA	–	–	–	–	–	0.13 (J)	–	–	NA	–	NA	NA	NA	NA	NA
0239-95-0207	39-01348	0.5–0.83	Soil	NA	NA	–	–	–	–	–	0.072 (J)	–	–	NA	–	NA	NA	NA	NA	NA
0239-95-0213	39-01351	0.0–0.5	Soil	NA	NA	–	–	–	–	–	0.076 (J)	–	–	NA	–	NA	NA	NA	NA	NA
0239-95-0222	39-01356	0.0–0.5	Soil	NA	NA	–	–	–	–	–	–	–	0.53	NA	–	NA	NA	NA	NA	NA
0239-95-0225	39-01357	0.0–0.5	Soil	NA	NA	–	–	–	–	–	0.045 (J)	–	–	NA	–	NA	NA	NA	NA	NA
0239-95-0227	39-01357	3.0–3.5	Soil	NA	NA	–	–	–	–	–	0.058 (J)	–	–	NA	–	NA	NA	NA	NA	NA
0239-95-0228	39-01358	0.0–0.5	Soil	NA	NA	–	–	–	–	–	0.038 (J)	–	–	NA	–	NA	NA	NA	NA	NA
0239-95-0231	39-01359	0.0–0.17	Soil	NA	NA	–	–	–	–	–	0.054 (J)	–	–	NA	–	NA	NA	NA	NA	NA
RE39-09-4196	39-604705	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	NA	–	0.000412	8.31E-05	7.28E-06	0.00000207 (J)	1.05E-05
RE39-09-4197	39-604705	1.0–2.0	Soil	–	–	–	–	–	–	0.039 (J)	–	–	–	–	–	7.59E-07	3.12E-06	–	–	0.000000466 (J)
RE39-09-4198	39-604706	0.0–1.0	Soil	0.62 (J)	–	–	–	–	–	–	–	–	–	NA	–	0.00000103 (J)	0.000000297 (J)	–	–	–
RE39-09-4199	39-604706	1.0–2.0	Soil	0.03 (J)	–	–	–	–	–	–	–	–	–	0.0023 (J)	–	7.59E-07	0.000000319 (J)	–	–	–
RE39-09-4200	39-604707	0.0–1.0	Soil	0.22 (J)	–	–	–	–	–	–	–	–	–	NA	–	0.00000119 (J)	2.43E-07	–	–	–
RE39-09-4201	39-604707	1.0–2.0	Soil	0.02 (J)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-4202	39-604708	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	NA	–	–	–	–	–	–
RE39-09-4203	39-604708	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-4204	39-604709	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	NA	–	–	0.000000274 (J)	–	–	–
RE39-09-4205	39-604709	1.0–2.0	Soil	–	–	–	–	–	–	–	0.31 (J)	–	–	–	–	–	–	–	–	–
RE39-09-4206	39-604710	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	NA	–	–	–	–	–	–
RE39-09-4207	39-604710	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-4208	39-604711	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	NA	–	–	–	–	–	–
RE39-09-4209	39-604711	1.0–2.0	Qbo	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-4210	39-604712	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	NA	–	3.72E-06	–	–	–	–
RE39-09-4211	39-604712	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	2.5E-06	–	–	–	–
RE39-09-4212	39-604713	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	NA	–	0.00000102 (J)	0.000000169 (J)	7.06E-08	–	–
RE39-09-4213	39-604713	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	0.000000555 (J)	–	–	–	–
RE39-09-4214	39-604714	0.0–1.0	Soil	–	–	–	–	–	–	–	0.39	–	–	NA	–	2.91E-06	0.000000677 (J)	–	–	–

Table 5.15-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzyl Alcohol	Bis(2-ethylhexyl)phthalate	Chrysene	Di-n-butylphthalate	Dichloroethane[1,2-]	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	**Hexachlorodibenzodioxin[1,2,3,6,7,8-]**
RE39-09-4215	39-604714	1.0–2.0	Soil	–	0.033 (J)	–	–	–	–	–	0.49	–	0.27 (J)	–	–	0.000000871 (J)	0.000000202 (J)	–	–	–
RE39-09-4216	39-604715	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	NA	–	5.47E-06	0.000000871 (J)	0.0000000839 (J)	–	0.000000184 (J)
RE39-09-4217	39-604715	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	4.11E-06	0.000000594 (J)	–	–	0.000000135 (J)
RE39-09-4218	39-604716	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	NA	–	9.49E-06	–	–	–	–
RE39-09-4219	39-604716	1.0–2.0	Soil	–	–	–	–	–	–	–	0.11 (J)	–	–	–	–	8.08E-06	–	–	–	–
RE39-09-4220	39-604717	0.0–1.0	Soil	–	–	0.042 (J)	0.2 (J)	0.044 (J)	0.11 (J)	–	–	0.35 (J)	–	NA	0.69	0.000232	0.000033	2.97E-06	3.46E-06	0.000007
RE39-09-4221	39-604717	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	1.81E-05	0.0000027 (J)	0.000000275 (J)	–	–
RE39-09-4222	39-604718	0.0–1.0	Soil	–	–	–	–	–	–	–	0.2 (J)	–	–	NA	–	0.000000854 (J)	–	–	–	–
RE39-09-4223	39-604718	1.0–2.0	Qbo	–	–	–	–	–	–	–	0.053 (J)	–	–	–	–	0.000000561 (J)	–	–	–	–
RE39-09-4224	39-604719	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	NA	–	9.25E-05	0.00000869 (J)	0.00000115 (J)	0.000000986 (J)	0.00000225 (J)
RE39-09-4225	39-604719	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	0.000329	3.12E-05	3.79E-06	3.13E-06	8.22E-06

Table 5.15-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	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-]	Isopropyltoluene[4-]	Methylene Chloride	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin[1,2,3,7,8-]
0239-95-0205	39-01347	0.5–0.83	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0239-95-0206	39-01348	0.0–0.5	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0239-95-0207	39-01348	0.5–0.83	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0239-95-0213	39-01351	0.0–0.5	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0239-95-0222	39-01356	0.0–0.5	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0239-95-0225	39-01357	0.0–0.5	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0239-95-0227	39-01357	3.0–3.5	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0239-95-0228	39-01358	0.0–0.5	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0239-95-0231	39-01359	0.0–0.17	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE39-09-4196	39-604705	0.0–1.0	Soil	3.76E-06	0.00000227 (J)	0.00000117 (J)	–	2.6E-06	NA	NA	0.00358	0.000435	0.000000541 (J)
RE39-09-4197	39-604705	1.0–2.0	Soil	–	–	–	–	–	–	0.031	0.000122	1.24E-05	–
RE39-09-4198	39-604706	0.0–1.0	Soil	–	–	–	–	–	NA	NA	7.87E-06	0.000000673 (J)	–
RE39-09-4199	39-604706	1.0–2.0	Soil	–	–	–	–	–	0.0003 (J)	0.029	5.71E-06	0.000000692 (J)	–
RE39-09-4200	39-604707	0.0–1.0	Soil	–	0.000000228 (J)	–	–	–	NA	NA	6.93E-06	0.000000768 (J)	–
RE39-09-4201	39-604707	1.0–2.0	Soil	–	–	–	–	–	0.00023 (J)	–	0.0000012 (J)	–	–
RE39-09-4202	39-604708	0.0–1.0	Soil	–	–	–	–	–	NA	NA	0.00000308 (J)	–	–
RE39-09-4203	39-604708	1.0–2.0	Soil	–	–	–	–	–	–	–	0.000000928 (J)	–	–
RE39-09-4204	39-604709	0.0–1.0	Soil	–	–	–	–	–	NA	NA	0.000015	–	–
RE39-09-4205	39-604709	1.0–2.0	Soil	–	–	–	–	–	–	–	1.06E-05	0.00000058 (J)	–
RE39-09-4206	39-604710	0.0–1.0	Soil	–	–	–	–	–	NA	NA	0.000003 (J)	–	–
RE39-09-4207	39-604710	1.0–2.0	Soil	–	–	–	–	–	–	–	0.00000181 (J)	–	–
RE39-09-4208	39-604711	0.0–1.0	Soil	–	–	–	–	–	NA	NA	0.00000477 (J+)	–	–
RE39-09-4209	39-604711	1.0–2.0	Qbo	–	–	–	–	–	–	–	0.000000944 (J)	–	–
RE39-09-4210	39-604712	0.0–1.0	Soil	–	–	–	–	–	NA	NA	4.41E-05	0.00000231 (J)	–
RE39-09-4211	39-604712	1.0–2.0	Soil	–	–	–	–	–	–	–	2.25E-05	0.00000116 (J)	–
RE39-09-4212	39-604713	0.0–1.0	Soil	–	–	–	–	–	NA	NA	6.51E-06	–	–
RE39-09-4213	39-604713	1.0–2.0	Soil	–	–	–	–	–	–	–	0.00000223 (J)	–	–
RE39-09-4214	39-604714	0.0–1.0	Soil	–	–	0.0000000808 (J)	–	0.0000000625 (J)	NA	NA	0.00002	0.00000113 (J)	–
RE39-09-4215	39-604714	1.0–2.0	Soil	–	–	–	–	–	–	–	5.2E-06	–	–
RE39-09-4216	39-604715	0.0–1.0	Soil	–	–	–	–	–	NA	NA	4.79E-05	0.00000404 (J)	–

Table 5.15-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	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-]	Isopropyltoluene[4-]	Methylene Chloride	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin[1,2,3,7,8-]
RE39-09-4217	39-604715	1.0–2.0	Soil	–	–	–	–	–	–	–	3.28E-05	0.00000173 (J)	–
RE39-09-4218	39-604716	0.0–1.0	Soil	–	–	–	–	–	NA	NA	0.0000749 (J)	5.3E-06	–
RE39-09-4219	39-604716	1.0–2.0	Soil	–	–	–	–	0.00000012 (J)	–	–	0.0000583 (J)	0.00000462 (J)	–
RE39-09-4220	39-604717	0.0–1.0	Soil	6.34E-06	0.00000119 (J)	0.00000133 (J)	–	0.00000232 (J)	NA	NA	0.00196 (J)	0.000121	0.00000155 (J)
RE39-09-4221	39-604717	1.0–2.0	Soil	0.000000537 (J)	0.000000114 (J)	0.000000175 (J)	–	0.000000197 (J)	–	–	0.000144 (J)	9.96E-06	–
RE39-09-4222	39-604718	0.0–1.0	Soil	–	–	–	–	–	NA	NA	0.00000493 (J)	0.000000393 (J)	–
RE39-09-4223	39-604718	1.0–2.0	Qbo	–	–	0.000000142 (J)	–	–	–	–	0.00000379 (J)	–	–
RE39-09-4224	39-604719	0.0–1.0	Soil	0.00000153 (J)	0.000000497 (J)	0.000000284 (J)	–	0.000000574 (J)	NA	NA	0.000793 (J)	3.88E-05	0.000000245 (J)
RE39-09-4225	39-604719	1.0–2.0	Soil	5.38E-06	0.00000166 (J)	0.00000105 (J)	0.00000027 (J)	0.00000183 (J)	–	–	0.00294 (J)	0.000136	0.000000763 (J)

Table 5.15-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Trichlorofluoromethane	Trimethylbenzene[1,3,5-]	Tris (o-cresyl) phosphate
0239-95-0205	39-01347	0.5–0.83	Soil	NA	NA	–	–	NA	NA	NA	NA
0239-95-0206	39-01348	0.0–0.5	Soil	NA	NA	–	–	NA	NA	NA	NA
0239-95-0207	39-01348	0.5–0.83	Soil	NA	NA	–	–	NA	NA	NA	NA
0239-95-0213	39-01351	0.0–0.5	Soil	NA	NA	–	–	NA	NA	NA	NA
0239-95-0222	39-01356	0.0–0.5	Soil	NA	NA	–	–	NA	NA	NA	NA
0239-95-0225	39-01357	0.0–0.5	Soil	NA	NA	–	–	NA	NA	NA	NA
0239-95-0227	39-01357	3.0–3.5	Soil	NA	NA	–	–	NA	NA	NA	NA
0239-95-0228	39-01358	0.0–0.5	Soil	NA	NA	–	–	NA	NA	NA	NA
0239-95-0231	39-01359	0.0–0.17	Soil	NA	NA	–	–	NA	NA	NA	NA
RE39-09-4196	39-604705	0.0–1.0	Soil	–	–	–	–	–	NA	NA	–
RE39-09-4197	39-604705	1.0–2.0	Soil	–	–	–	–	–	–	–	–
RE39-09-4198	39-604706	0.0–1.0	Soil	–	–	–	–	–	NA	NA	–
RE39-09-4199	39-604706	1.0–2.0	Soil	–	–	–	–	–	–	0.0025 (J)	–
RE39-09-4200	39-604707	0.0–1.0	Soil	–	–	–	–	–	NA	NA	–
RE39-09-4201	39-604707	1.0–2.0	Soil	–	–	–	–	–	–	0.0021 (J)	–
RE39-09-4202	39-604708	0.0–1.0	Soil	–	–	–	–	–	NA	NA	–
RE39-09-4203	39-604708	1.0–2.0	Soil	–	–	–	–	–	0.0019 (J)	–	–
RE39-09-4204	39-604709	0.0–1.0	Soil	–	–	–	–	–	NA	NA	–
RE39-09-4205	39-604709	1.0–2.0	Soil	–	–	–	–	–	–	–	–
RE39-09-4206	39-604710	0.0–1.0	Soil	–	–	–	–	–	NA	NA	–
RE39-09-4207	39-604710	1.0–2.0	Soil	–	–	–	–	–	0.00075 (J)	–	–
RE39-09-4208	39-604711	0.0–1.0	Soil	–	–	–	–	–	NA	NA	–
RE39-09-4209	39-604711	1.0–2.0	Qbo	–	–	–	–	–	–	–	–
RE39-09-4210	39-604712	0.0–1.0	Soil	–	–	–	–	–	NA	NA	–
RE39-09-4211	39-604712	1.0–2.0	Soil	–	–	–	–	–	–	–	–
RE39-09-4212	39-604713	0.0–1.0	Soil	–	–	–	–	–	NA	NA	–
RE39-09-4213	39-604713	1.0–2.0	Soil	–	–	–	–	–	0.00097 (J)	–	–
RE39-09-4214	39-604714	0.0–1.0	Soil	–	–	–	–	–	NA	NA	0.017 (J)
RE39-09-4215	39-604714	1.0–2.0	Soil	–	–	–	–	–	0.00093 (J)	–	–
RE39-09-4216	39-604715	0.0–1.0	Soil	–	–	–	–	–	NA	NA	0.014 (J)
RE39-09-4217	39-604715	1.0–2.0	Soil	–	–	–	–	0.0000000502 (J)	0.0016 (J)	–	–

Table 5.15-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Trichlorofluoromethane	Trimethylbenzene[1,3,5-]	Tris (o-cresyl) phosphate
RE39-09-4218	39-604716	0.0–1.0	Soil	–	–	–	–	–	NA	NA	0.03 (J)
RE39-09-4219	39-604716	1.0–2.0	Soil	–	–	–	–	–	–	–	–
RE39-09-4220	39-604717	0.0–1.0	Soil	0.000000186 (J)	0.000000403 (J)	0.077 (J)	0.29 (J)	–	NA	NA	–
RE39-09-4221	39-604717	1.0–2.0	Soil	–	–	–	–	–	–	–	–
RE39-09-4222	39-604718	0.0–1.0	Soil	–	–	–	–	–	NA	NA	–
RE39-09-4223	39-604718	1.0–2.0	Qbo	–	–	–	–	–	–	–	–
RE39-09-4224	39-604719	0.0–1.0	Soil	–	–	–	–	–	NA	NA	–
RE39-09-4225	39-604719	1.0–2.0	Soil	0.000000137 (J)	0.00000029 (J)	–	–	–	–	–	–

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] NA = Not analyzed.

[b] – = If analyzed, sample result is not detected.

Table 5.15-4
Summary of Radionuclides Detected or Detected above BVs/FVs at SWMU 39-008

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-239/240	Thorium-228	Thorium-230	Thorium-232	Tritium	Uranium-235	Uranium-235/236	Uranium-238
Soil Background Value[a]				**0.013**	**1.65**	**0.054**	**2.28**	**2.29**	**2.33**	**na**[b]	**0.2**	**0.2**	**2.29**
0239-95-0207	39-01348	0.5–0.83	Soil	–[c]	–	0.00901	–	–	–	NA[d]	–	NA	NA
0239-95-0208	39-01349	0.0–0.5	Soil	–	–	–	–	–	–	NA	105	NA	NA
0239-95-0210	39-01349	0.5–0.83	Soil	–	–	0.0473	–	–	–	NA	44.8	NA	NA
0239-95-0212	39-01350	0.5–0.83	Soil	–	–	–	–	–	–	NA	–	NA	NA
0239-95-0213	39-01351	0.0–0.5	Soil	–	–	–	–	2.31	–	NA	–	NA	NA
0239-95-0214	39-01351	0.5–0.83	Soil	–	–	–	2.31	2.42	–	NA	–	NA	NA
0239-95-0215	39-01352	0.0–0.5	Soil	–	–	–	–	–	–	NA	9.87	NA	NA
0239-95-0216	39-01352	0.5–0.83	Soil	–	–	–	–	–	–	NA	2.46	NA	NA
0239-95-0221	39-01355	5.5–6.0	Soil	–	–	–	–	–	–	NA	0.37	NA	NA
0239-95-0227	39-01357	3.0–3.5	Soil	–	–	–	2.51	2.56	2.58	NA	0.38	NA	NA
0239-95-0230	39-01358	4.5–5.0	Soil	–	–	0.005	2.39	2.35	2.42	NA	0.45	NA	NA
0239-95-0231	39-01359	0.0–0.17	Soil	–	–	–	–	–	–	NA	0.35	NA	NA
RE39-09-4196	39-604705	0.0–1.0	Soil	0.25	–	–	NA	NA	NA	–	NA	–	2.96
RE39-09-4198	39-604706	0.0–1.0	Soil	–	–	–	NA	NA	NA	–	NA	0.227	3.3
RE39-09-4199	39-604706	1.0–2.0	Soil	–	0.144	–	NA	NA	NA	–	NA	–	–
RE39-09-4200	39-604707	0.0–1.0	Soil	–	–	–	NA	NA	NA	–	NA	0.263	2.51
RE39-09-4202	39-604708	0.0–1.0	Soil	–	–	–	NA	NA	NA	1.18	NA	–	–
RE39-09-4210	39-604712	0.0–1.0	Soil	–	–	–	NA	NA	NA	–	NA	–	2.57
RE39-09-4212	39-604713	0.0–1.0	Soil	–	–	–	NA	NA	NA	–	NA	–	3.18
RE39-09-4213	39-604713	1.0–2.0	Soil	–	–	–	NA	NA	NA	–	NA	–	6.6
RE39-09-4216	39-604715	0.0–1.0	Soil	–	–	–	NA	NA	NA	–	NA	–	2.34
RE39-09-4218	39-604716	0.0–1.0	Soil	–	–	–	NA	NA	NA	–	NA	–	2.92

Table 5.15-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-239/240	Thorium-228	Thorium-230	Thorium-232	Tritium	Uranium-235	Uranium-235/236	Uranium-238
Soil Background Value[a]				**0.013**	**1.65**	**0.054**	**2.28**	**2.29**	**2.33**	**na**[b]	**0.2**	**0.2**	**2.29**
RE39-09-4219	39-604716	1.0–2.0	Soil	–	0.152	–	NA	NA	NA	–	NA	–	–
RE39-09-4220	39-604717	0.0–1.0	Soil	–	–	–	NA	NA	NA	–	NA	–	4.2
RE39-09-4222	39-604718	0.0–1.0	Soil	–	–	–	NA	NA	NA	–	NA	–	2.56

Source: BVs/FVs from LANL (1998, 059730).

Notes: Units are pCi/g. Data qualifiers are defined in Appendix A.

[a] Applies only to samples from 0 to 1 ft bgs.

[b] na = Not available.

[c] – = If analyzed, sample result is less than BV/FV. If no BV/FV is available, analyte was not detected.

[d] NA = Not analyzed.

Table 5.15-5
Summary of COPCs for SWMU 39-008

Soil	Qbo
Inorganic COPCs	
Antimony	Barium
Cadmium	Chromium
Chromium	Iron
Cobalt	Manganese
Copper	Nitrate
Cyanide	Selenium
Lead	Zinc
Mercury	
Nitrate	
Selenium	
Silver	
Thallium	
Uranium	
Organic COPCs	
Aroclor-1254	Bis(2-ethylhexyl)phthalate
Aroclor-1260	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]
Benzo(a)anthracene	Heptachlorodibenzodioxins (Total)
Benzo(b)fluoranthene	Hexachlorodibenzofuran[1,2,3,6,7,8-]
Benzo(g,h,i)perylene	Hexachlorodibenzofurans (Total)
Benzo(k)fluoranthene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
Benzyl Alcohol	
Bis(2-ethylhexyl)phthalate	
Chrysene	
Di-n-butylphthalate	
Dichloroethane[1,2-]	
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)	
Hexachlorodibenzofuran[1,2,3,4,7,8-]	

Table 5.15-5 (continued)

Soil	Qbo
Hexachlorodibenzofuran[1,2,3,6,7,8-]	
Hexachlorodibenzofuran[1,2,3,7,8,9-]	
Hexachlorodibenzofuran[2,3,4,6,7,8-]	
Hexachlorodibenzofurans (Total)	
Isopropyltoluene[4-]	
Methylene Chloride	
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-]	
Pentachlorodibenzofuran[2,3,4,7,8-]	
Pentachlorodibenzofurans (Totals)	
Phenanthrene	
Pyrene	
Tetrachlorodibenzodioxin[2,3,7,8-]	
Tetrachlorodibenzodioxins (Total)	
Tetrachlorodibenzofurans (Totals)	
Trichlorofluoromethane	
Trimethylbenzene[1,3,5-]	
Tris (o-cresyl) phosphate	
Radionuclide COPCs	
Americium-241	None
Cesium-137	
Plutonium-239/240	
Thorium-228	
Thorium-230	
Thorium-232	
Tritium	
Uranium-235	
Uranium-235/236	
Uranium-238	

Table 5.16-1
Summary of Samples Collected and Analyses Requested for SWMU 39-010

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-2112	39-604425	0.0–1.0	Soil	X[a]	X	–[b]	X	X	X	X	X	X	X	X	X	–	X
RE39-09-2113	39-604425	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2114	39-604425	2.0–3.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2115	39-604426	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-2116	39-604426	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2117	39-604426	2.0–3.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2118	39-604427	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-2119	39-604427	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2120	39-604427	2.0–3.0	Qbo	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2121	39-604428	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-2122	39-604428	1.0–2.0	Qbo	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2123	39-604428	2.0–3.0	Qbo	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2124	39-604429	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-2125	39-604429	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2126	39-604429	2.0–3.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2127	39-604430	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-2128	39-604430	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2129	39-604430	2.0–3.0	Qbo	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2130	39-604431	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-2131	39-604431	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2132	39-604431	2.0–3.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X

Table 5.16-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-2133	39-604432	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-2134	39-604432	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2135	39-604432	2.0–3.0	Qbo	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2136	39-604433	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-2137	39-604433	1.0–2.0	Qbo	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2138	39-604433	2.0–3.0	Qbo	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2139	39-604434	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-2140	39-604434	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2141	39-604434	2.0–3.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2142	39-604435	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-2143	39-604435	1.0–2.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2144	39-604435	2.0–3.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2145	39-604436	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-2146	39-604436	1.0–2.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2147	39-604436	2.0–3.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2148	39-604437	0.0–1.0	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2149	39-604437	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2150	39-604437	2.0–3.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2151	39-604438	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2152	39-604438	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2153	39-604438	2.0–3.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2154	39-604439	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2155	39-604439	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2156	39-604439	2.0–3.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X

Table 5.16-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-2157	39-604440	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2158	39-604440	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2159	39-604440	2.0–3.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2160	39-604441	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2161	39-604441	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2162	39-604441	2.0–3.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2163	39-604442	0.0–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2164	39-604442	1.0–2.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2165	39-604442	2.0–3.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X

[a] X = Analysis was performed.

[b] – = Analysis not requested.

Table 5.16-2
Summary of Inorganic Chemicals above BVs at SWMU 39-010

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Cyanide (Total)	Chromium	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Sed Background Value				**15400**	**0.83**	**0.56**	**127**	**1.31**	**0.4**	**0.82**	**10.5**	**11.2**	**13800**	**19.7**	**2370**	**543**	**0.1**	**9.38**	**na[a]**	**na**	**0.3**	**19.7**	**60.2**
Soil Background Value				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**0.5**	**19.3**	**14.7**	**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Qbo Background Value				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**0.5**	**2.6**	**3.96**	**3700**	**13.5**	**739**	**189**	**0.1**	**na**	**na**	**na**	**0.3**	**4.59**	**40**
RE39-09-2112	39-604425	0.0–1.0	Soil	–[b]	–	–	–	–	–	–		55.6		–	–	–	0.308 (J)	–	3.8	–	–	–	–
RE39-09-2113	39-604425	1.0–2.0	Soil	–	–	–	–	–	–	0.58 (U)		14.8		–	–	–	0.157 (U)	–	0.35	–	–	–	–
RE39-09-2114	39-604425	2.0–3.0	Soil	–	–	–	–	–	–	–		–	–	–	–	–	0.137 (U)	–	0.29	–	–	–	–
RE39-09-2115	39-604426	0.0–1.0	Soil	–	–	–	–	–	–	–		–	–	–	–	–	0.587 (J)	–	10.1	–	–	–	–
RE39-09-2116	39-604426	1.0–2.0	Soil	–	–	–	–	–	–	–		–	–	–	–	–	1.95	–	3.7	–	–	–	–
RE39-09-2117	39-604426	2.0–3.0	Soil	–	–	–	–	3.9	–	–		58.7	–	35.7	–	–	2.47	–	2.7	–	–	–	89
RE39-09-2118	39-604427	0.0–1.0	Soil	–	–	–	–	–	–	–		–	–	–	–	–	–	–	3.7	–	–	–	–
RE39-09-2119	39-604427	1.0–2.0	Soil	–	–	–	–	–	–	0.55 (U)		–	–	–	–	–	–	–	1.3	–	–	–	–
RE39-09-2120	39-604427	2.0–3.0	Qbo	3600	–	1.4	65.8		–		3.6	4	7370	–	929	303	–	4.7	0.49	–	–	9	–
RE39-09-2121	39-604428	0.0–1.0	Soil	–	–	–	–	–	–	–		241	–	33.6	–	–	–	–	2.8	–	–	–	138
RE39-09-2122	39-604428	1.0–2.0	Qbo	–	–	–	39.1		–		4.7	15.8	3750	25.5	–	196	–	2.9	0.18 (J)	–	–	–	55.3
RE39-09-2123	39-604428	2.0–3.0	Qbo	–	–	0.65 (J)	44.1		–		38.8	4.6	4140	–	–	195	–	18.7	2.4	–	–	–	–
RE39-09-2124	39-604429	0.0–1.0	Soil	–	1.16 (U)	–	–	–	0.582 (U)	NA[c]		–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-2125	39-604429	1.0–2.0	Soil	–	1.17 (U)	–	–	–	0.587 (U)	NA		–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-2126	39-604429	2.0–3.0	Soil	–	1.06 (U)	–	–	–	0.531 (U)	NA		–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-2127	39-604430	0.0–1.0	Soil	–	1.13 (U)	–	–	–	0.566 (U)	NA		–	–	–	–	–	–	–	3.22 (J-)	0.000738 (J)	–	–	–
RE39-09-2128	39-604430	1.0–2.0	Soil	–	1.13 (U)	–	–	–	0.566 (U)	–		–	–	–	–	–	–	–	7.78 (J-)	–	–	–	–
RE39-09-2129	39-604430	2.0–3.0	Qbo	–	1.14 (U)	1.1 (U)	–		0.569 (U)		–	4.74	4200	–	–	–	–	–	3.11 (J-)	0.00102 (J)	1.1 (UJ)	–	–
RE39-09-2130	39-604431	0.0–1.0	Soil	–	1.11 (U)	–	–	–	0.557 (U)	NA		–	–	–	–	–	0.128	–	1.91 (J-)	–	–	–	–
RE39-09-2131	39-604431	1.0–2.0	Soil	–	1.15 (U)	–	–	–	0.573 (U)	–		–	–	–	–	–	–	–	1.12 (J-)	–	–	–	–
RE39-09-2132	39-604431	2.0–3.0	Soil	–	1.07 (U)	–	–	–	0.537 (U)	NA		–	–	–	–	–	–	–	1.29 (J-)	–	–	–	–
RE39-09-2133	39-604432	0.0–1.0	Soil	–	1.08 (U)	–	–	–	0.538 (U)	NA		1100	–	43.8	–	–	0.294	–	1.01 (J-)	–	–	–	–
RE39-09-2134	39-604432	1.0–2.0	Soil	–	1.12 (U)	–	–	–	0.561 (U)	NA		1060	–	53.4	–	–	0.579	–	0.733 (J-)	–	–	–	49.5 (J)
RE39-09-2135	39-604432	2.0–3.0	Qbo	–	1.14 (U)	1.29	26.7		0.569 (U)		3.7	92.2	5840	51.2	–	259	0.338	2.14	0.717 (J-)	–	1.1 (UJ)	–	45.8 (J)
RE39-09-2136	39-604433	0.0–1.0	Soil	–	1.08 (U)	–	–	–	0.538 (U)	–		–	–	–	–	–	–	–	3.41 (J-)	0.000595 (J)	–	–	–
RE39-09-2137	39-604433	1.0–2.0	Qbo	3920	1.08 (U)	1.04 (J)	61.3		0.541 (U)		4.2	7.05	7280	23.6	967 (J+)	220	–	4.01	2.54 (J-)	0.000583 (J)	1.09 (UJ)	8.47	–
RE39-09-2138	39-604433	2.0–3.0	Qbo	–	–	0.822 (J)	71.8		0.543 (U)		3.54	27.4	6920	62	–	240	–	3.07	2.28 (J-)	0.000572 (J)	1.04 (UJ)	6.12	40.4 (J)
RE39-09-2139	39-604434	0.0–1.0	Soil	–	1.19	–	–	–	0.567 (U)	NA		43.9	–	55.4	–	–	–	–	1.17 (J-)	–	–	–	54.4 (J)
RE39-09-2140	39-604434	1.0–2.0	Soil	–	1.08 (U)	–	–	–	0.538 (U)	NA		–	–	–	–	–	–	–	1.03 (J-)	–	–	–	–
RE39-09-2141	39-604434	2.0–3.0	Sed	–	1.01 (U)	–	–	–	0.506 (U)	NA		–	–	–	–	–	–	–	0.748 (J-)	–	1.06 (UJ)	–	–
RE39-09-2142	39-604435	0.0–1.0	Soil	–	1.08 (U)	–	–	–	0.541 (U)	–		–	–	–	–	–	0.12	–	4.29 (J-)	–	–	–	–
RE39-09-2143	39-604435	1.0–2.0	Sed	–	1.04 (U)	–	–	–	0.522 (U)	NA		–	–	–	–	–	–	–	1.79 (J-)	–	1.02 (UJ)	–	–

Table 5.16-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Cyanide (Total)	Chromium	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Sed Background Value				**15400**	**0.83**	**0.56**	**127**	**1.31**	**0.4**	**0.82**	**10.5**	**11.2**	**13800**	**19.7**	**2370**	**543**	**0.1**	**9.38**	**na[a]**	**na**	**0.3**	**19.7**	**60.2**
Soil Background Value				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**0.5**	**19.3**	**14.7**	**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Qbo Background Value				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**0.5**	**2.6**	**3.96**	**3700**	**13.5**	**739**	**189**	**0.1**	**na**	**na**	**na**	**0.3**	**4.59**	**40**
RE39-09-2144	39-604435	2.0–3.0	Sed	–	1.01 (U)	–	–	–	0.505 (U)	–	–	–	–	–	–	–	–	–	1.4	–	0.998 (UJ)	–	–
RE39-09-2145	39-604436	0.0–1.0	Soil	–	1.14 (U)	–	–	–	0.569 (U)	–	–	20.2 (J+)	–	–	–	–	–	–	23.1	0.00486	–	–	–
RE39-09-2146	39-604436	1.0–2.0	Sed	–	1.04 (U)	–	–	–	0.522 (U)	–	–	–	–	–	–	–	–	–	3.97	0.00169 (J)	1.05 (UJ)	–	–
RE39-09-2147	39-604436	2.0–3.0	Sed	–	1.03 (U)	–	–	–	0.514 (U)	–	–	–	–	–	–	–	–	–	1.62	0.0016 (J)	1.01 (UJ)	–	–
RE39-09-2148	39-604437	0.0–1.0	Soil	–	–	–	–	–	–	0.53 (U)	–	29.7	–	–	–	–	0.459 (J+)	–	0.93 (J+)	–	–	–	–
RE39-09-2149	39-604437	1.0–2.0	Soil	–	–	–	–	–	0.54 (J-)	0.54 (U)	–	2530	–	–	–	–	0.272 (J+)	–	0.44 (J+)	–	–	–	–
RE39-09-2150	39-604437	2.0–3.0	Soil	–	–	–	–	2.1	–	0.52 (U)	–	38.9	–	–	–	–	–	–	0.63 (J+)	–	–	–	–
RE39-09-2151	39-604438	0.0–1.0	Soil	–	–	–	–	–	–	0.54 (U)	–	–	–	–	–	–	–	–	1.2 (J+)	–	–	–	–
RE39-09-2152	39-604438	1.0–2.0	Soil	–	–	–	–	–	–	0.54 (U)	–	–	–	–	–	–	–	–	0.36 (J+)	–	–	–	–
RE39-09-2153	39-604438	2.0–3.0	Soil	–	–	–	–	–	–	0.54 (U)	–	–	–	–	–	–	–	–	5 (J+)	–	–	–	–
RE39-09-2154	39-604439	0.0–1.0	Soil	–	–	–	–	–	–	0.55 (U)	–	15.6	–	–	–	–	–	–	–	–	–	–	–
RE39-09-2155	39-604439	1.0–2.0	Soil	–	–	–	–	–	–	0.55 (U)	–	27.9	–	–	–	–	0.178 (J+)	–	–	–	–	–	–
RE39-09-2156	39-604439	2.0–3.0	Soil	–	–	–	–	–	–	0.55 (U)	–	66.7	–	–	–	–	0.111 (J+)	–	0.65 (J+)	–	–	–	–
RE39-09-2157	39-604440	0.0–1.0	Soil	–	–	–	–	–	–	0.54 (U)	–	–	–	–	–	–	0.17 (J+)	–	1.2 (J+)	–	–	–	–
RE39-09-2158	39-604440	1.0–2.0	Soil	–	–	–	–	–	–	0.55 (U)	–	–	–	–	–	–	0.521 (J+)	–	4.7 (J+)	–	–	–	–
RE39-09-2159	39-604440	2.0–3.0	Soil	–	–	–	–	–	–	0.55 (U)	–	–	–	–	–	–	–	–	1.1 (J+)	–	–	–	–
RE39-09-2160	39-604441	0.0–1.0	Soil	–	–	–	–	–	–	0.54 (U)	–	–	–	–	–	–	0.363 (J+)	–	–	–	–	–	–
RE39-09-2161	39-604441	1.0–2.0	Soil	–	–	–	–	–	–	0.56 (U)	–	31.9	–	–	–	–	0.202 (J+)	–	1 (J+)	–	–	–	–
RE39-09-2162	39-604441	2.0–3.0	Soil	–	–	–	–	–	–	0.54 (U)	–	15.2	–	–	–	–	0.201 (J+)	–	1.5 (J+)	–	–	–	–
RE39-09-2163	39-604442	0.0–1.0	Soil	–	–	–	–	3.6	–	0.54 (U)	–	58.2	–	–	–	–	1.06 (J+)	–	1.2 (J+)	–	–	–	–
RE39-09-2164	39-604442	1.0–2.0	Soil	–	–	–	–	2.3	–	0.54 (U)	–	101	–	–	–	–	0.902 (J+)	–	2.9 (J+)	–	–	–	–
RE39-09-2165	39-604442	2.0–3.0	Soil	–	–	–	–	2.3	–	0.52 (U)	–	56	–	–	–	–	0.662 (J+)	–	3 (J+)	–	–	–	–

Source: BVs from LANL (1998, 059730).

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] na = Not available.

[b] – = If analyzed, sample result is less than the BV.

[c] NA = Not analyzed.

Table 5.16-3
Summary of Organic Chemicals Detected at SWMU 39-010

Sample ID	Location ID	Depth (ft)	Media	Amino-2,6-dinitrotoluene[4-]	Amino-4,6-dinitrotoluene[2-]	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	Chloromethane	Chrysene	Di-n-butylphthalate	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]
RE39-09-2113	39-604425	1.0–2.0	Soil	–[a]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	NA[b]	NA	NA
RE39-09-2116	39-604426	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	0.11 (J)	–	–	–	–	–	NA	NA	NA
RE39-09-2117	39-604426	2.0–3.0	Soil	NA	NA	–	–	–	–	–	–	–	0.84	–	–	–	–	–	NA	NA	NA
RE39-09-2121	39-604428	0.0–1.0	Soil	NA	NA	–	–	–	–	–	–	–	–	–	NA	–	1.3	–	NA	NA	NA
RE39-09-2122	39-604428	1.0–2.0	Qbo	–	–	–	–	–	–	–	–	–	–	0.24 (J)	–	–	0.14 (J)	–	NA	NA	NA
RE39-09-2123	39-604428	2.0–3.0	Qbo	–	–	–	–	–	–	–	–	–	–	–	–	–	0.073 (J)	–	NA	NA	NA
RE39-09-2133	39-604432	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	NA	–	2.76	–	NA	NA	NA
RE39-09-2134	39-604432	1.0–2.0	Soil	–	–	0.0032 (J)	–	–	–	–	–	–	–	–	–	–	–	–	NA	NA	NA
RE39-09-2135	39-604432	2.0–3.0	Qbo	–	–	0.0147	0.0041	–	–	–	–	–	–	–	–	–	–	–	NA	NA	NA
RE39-09-2137	39-604433	1.0–2.0	Qbo	–	–	–	–	–	–	–	–	–	–	–	–	–	0.0501 (J)	–	NA	NA	NA
RE39-09-2138	39-604433	2.0–3.0	Qbo	–	–	–	–	–	–	–	–	–	–	–	–	–	0.0421 (J)		NA	NA	NA
RE39-09-2139	39-604434	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	NA	–	0.0446 (J)	–	NA	NA	NA
RE39-09-2142	39-604435	0.0–1.0	Soil	–	–	0.0015 (J)	–	–	–	–	–	–	–	–	NA	–	–	–	NA	NA	NA
RE39-09-2148	39-604437	0.0–1.0	Soil	–	–	–	0.0049 (J)	–	–	–	–	–	–	–	–	–	–	–	9.47E-05	9.72E-06	0.00000083 (J)
RE39-09-2149	39-604437	1.0–2.0	Soil	–	–	–	0.0051 (J)	–	–	–	–	–	–	–	–	–	0.085 (J)	–	NA	NA	NA
RE39-09-2150	39-604437	2.0–3.0	Soil	–	–	–	–	–	–	–	–	–	0.049 (J)	–	–	–	3.8	–	NA	NA	NA
RE39-09-2153	39-604438	2.0–3.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	0.19 (J)	–	NA	NA	NA
RE39-09-2154	39-604439	0.0–1.0	Soil	0.0064 (J)	0.0099 (J)	–	–	–	–	–	–	–	–	–	–	–	–	–	NA	NA	NA
RE39-09-2156	39-604439	2.0–3.0	Soil	0.016 (J)	–	–	–	–	–	–	–	–	0.059 (J)	–	–	–	0.89	–	NA	NA	NA
RE39-09-2157	39-604440	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	0.053 (J)	–	NA	NA	NA
RE39-09-2160	39-604441	0.0–1.0	Soil	–	–	–	–	0.094 (J)	0.12 (J)	0.097 (J)	0.072 (J)	0.1 (J)	–	–	–	0.12 (J)	–	0.19 (J)	NA	NA	NA
RE39-09-2161	39-604441	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	0.041 (J)	–	NA	NA	NA
RE39-09-2162	39-604441	2.0–3.0	Soil	–	–	–	–	0.059 (J)	0.066 (J)	0.06 (J)	–	0.056 (J)	–	–	–	0.067 (J)	–	0.12 (J)	NA	NA	NA
RE39-09-2163	39-604442	0.0–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	0.00053 (J)	–	–	–	NA	NA	NA
RE39-09-2164	39-604442	1.0–2.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	0.036 (J)	–	NA	NA	NA
RE39-09-2165	39-604442	2.0–3.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	0.09 (J)	–	NA	NA	NA

Table 5.16-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	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-]	Hexanone[2-]	HMX	Indeno(1,2,3-cd)pyrene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
RE39-09-2113	39-604425	1.0–2.0	Soil	NA	NA	NA	NA	NA	NA	NA	–	–	–	NA	NA
RE39-09-2116	39-604426	1.0–2.0	Soil	NA	NA	NA	NA	NA	NA	NA	–	0.087 (J)	–	NA	NA
RE39-09-2117	39-604426	2.0–3.0	Soil	NA	NA	NA	NA	NA	NA	NA	–	2.6 (J)	–	NA	NA
RE39-09-2121	39-604428	0.0–1.0	Soil	NA	NA	NA	NA	NA	NA	NA	NA	–	–	NA	NA
RE39-09-2122	39-604428	1.0–2.0	Qbo	NA	NA	NA	NA	NA	NA	NA	–	–	–	NA	NA
RE39-09-2123	39-604428	2.0–3.0	Qbo	NA	NA	NA	NA	NA	NA	NA	–	–	–	NA	NA
RE39-09-2133	39-604432	0.0–1.0	Soil	NA	NA	NA	NA	NA	NA	NA	NA	–	–	NA	NA
RE39-09-2134	39-604432	1.0–2.0	Soil	NA	NA	NA	NA	NA	NA	NA	–	1.47	–	NA	NA
RE39-09-2135	39-604432	2.0–3.0	Qbo	NA	NA	NA	NA	NA	NA	NA	–	0.75	–	NA	NA
RE39-09-2137	39-604433	1.0–2.0	Qbo	NA	NA	NA	NA	NA	NA	NA	–	–	–	NA	NA
RE39-09-2138	39-604433	2.0–3.0	Qbo	NA	NA	NA	NA	NA	NA	NA	–	–	–	NA	NA
RE39-09-2139	39-604434	0.0–1.0	Soil	NA	NA	NA	NA	NA	NA	NA	NA	–	–	NA	NA
RE39-09-2142	39-604435	0.0–1.0	Soil	NA	NA	NA	NA	NA	NA	NA	NA	–	–	NA	NA
RE39-09-2148	39-604437	0.0–1.0	Soil	0.000000682 (J)	0.00000219 (J)	0.0000013 (J)	0.00000112 (J)	0.000000566 (J)	0.000000558 (J)	0.000000869 (J)	–	–	–	0.000989	0.000021
RE39-09-2149	39-604437	1.0–2.0	Soil	NA	NA	NA	NA	NA	NA	NA	–	0.034 (J-)	–	NA	NA
RE39-09-2150	39-604437	2.0–3.0	Soil	NA	NA	NA	NA	NA	NA	NA	–	–	–	NA	NA
RE39-09-2153	39-604438	2.0–3.0	Soil	NA	NA	NA	NA	NA	NA	NA	–	–	–	NA	NA
RE39-09-2154	39-604439	0.0–1.0	Soil	NA	NA	NA	NA	NA	NA	NA	–	–	–	NA	NA
RE39-09-2156	39-604439	2.0–3.0	Soil	NA	NA	NA	NA	NA	NA	NA	0.0038 (J)	0.01 (J-)	–	NA	NA
RE39-09-2157	39-604440	0.0–1.0	Soil	NA	NA	NA	NA	NA	NA	NA	–	–	–	NA	NA
RE39-09-2160	39-604441	0.0–1.0	Soil	NA	NA	NA	NA	NA	NA	NA	–	0.01 (J-)	0.065 (J)	NA	NA
RE39-09-2161	39-604441	1.0–2.0	Soil	NA	NA	NA	NA	NA	NA	NA	–	–	–	NA	NA
RE39-09-2162	39-604441	2.0–3.0	Soil	NA	NA	NA	NA	NA	NA	NA	–	–	–	NA	NA
RE39-09-2163	39-604442	0.0–1.0	Soil	NA	NA	NA	NA	NA	NA	NA	–	0.036 (J-)	–	NA	NA
RE39-09-2164	39-604442	1.0–2.0	Soil	NA	NA	NA	NA	NA	NA	NA	–	0.66 (J-)	–	NA	NA
RE39-09-2165	39-604442	2.0–3.0	Soil	NA	NA	NA	NA	NA	NA	NA	–	0.14 (J-)	–	NA	NA

Table 5.16-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Phenanthrene	Pyrene	RDX	Trimethylbenzene[1,3,5-]	Trinitrotoluene[2,4,6-]
RE39-09-2113	39-604425	1.0–2.0	Soil	NA	NA	–	–	0.028 (J)	–	–
RE39-09-2116	39-604426	1.0–2.0	Soil	NA	NA	–	–	3.7	–	–
RE39-09-2117	39-604426	2.0–3.0	Soil	NA	NA	–	–	–	–	–
RE39-09-2121	39-604428	0.0–1.0	Soil	NA	NA	–	–	–	NA	–
RE39-09-2122	39-604428	1.0–2.0	Qbo	NA	NA	–	–	–	–	–
RE39-09-2123	39-604428	2.0–3.0	Qbo	NA	NA	–	–	–	–	–
RE39-09-2133	39-604432	0.0–1.0	Soil	NA	NA	–	–	–	NA	–
RE39-09-2134	39-604432	1.0–2.0	Soil	NA	NA	–	–	25.3	–	–
RE39-09-2135	39-604432	2.0–3.0	Qbo	NA	NA	–	–	8.49	–	0.293 (J)
RE39-09-2137	39-604433	1.0–2.0	Qbo	NA	NA	–	–	–	–	–
RE39-09-2138	39-604433	2.0–3.0	Qbo	NA	NA	–	–	–	–	–
RE39-09-2139	39-604434	0.0–1.0	Soil	NA	NA	–	–	–	NA	–
RE39-09-2142	39-604435	0.0–1.0	Soil	NA	NA	–	–	–	NA	–
RE39-09-2148	39-604437	0.0–1.0	Soil	0.000000257 (J)	0.000000693 (J)	–	–	–	–	–
RE39-09-2149	39-604437	1.0–2.0	Soil	NA	NA	–	–	0.16	–	–
RE39-09-2150	39-604437	2.0–3.0	Soil	NA	NA	–	–	–	–	–
RE39-09-2153	39-604438	2.0–3.0	Soil	NA	NA	–	–	–	0.0005 (J)	–
RE39-09-2154	39-604439	0.0–1.0	Soil	NA	NA	–	–	–	–	0.033 (J)
RE39-09-2156	39-604439	2.0–3.0	Soil	NA	NA	–	–	–	–	0.0066 (J)
RE39-09-2157	39-604440	0.0–1.0	Soil	NA	NA	–	–	–	–	–
RE39-09-2160	39-604441	0.0–1.0	Soil	NA	NA	0.064 (J)	0.18 (J)	–	–	–
RE39-09-2161	39-604441	1.0–2.0	Soil	NA	NA	–	–	–	–	–
RE39-09-2162	39-604441	2.0–3.0	Soil	NA	NA	0.05 (J)	0.1 (J)	–	–	–
RE39-09-2163	39-604442	0.0–1.0	Soil	NA	NA	–	–	–	–	–
RE39-09-2164	39-604442	1.0–2.0	Soil	NA	NA	–	–	–	–	–
RE39-09-2165	39-604442	2.0–3.0	Soil	NA	NA	–	–	–	0.00046 (J)	–

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] – = If analyzed, sample result is not detected.

[b] NA = Not analyzed.

Table 5.16-4
Summary of Radionuclides Detected or Detected above BVs/FVs at SWMU 39-010

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Soil Background Value[a]				**1.65**	**na**[b]	**2.59**	**0.2**	**2.29**
Qbo Background Value				**na**	**na**	**4**	**0.18**	**3.9**
RE39-09-2112	39-604425	0.0–1.0	Soil	–[c]	–	2.68	0.223	9.42
RE39-09-2113	39-604425	1.0–2.0	Soil	–	–	12.7	1.93 (J)	90
RE39-09-2114	39-604425	2.0–3.0	Soil	–	–	–	0.266	–
RE39-09-2115	39-604426	0.0–1.0	Soil	–	–	3.86	0.45	19.4
RE39-09-2116	39-604426	1.0–2.0	Soil	0.205	–	6.83	0.74	42.9
RE39-09-2117	39-604426	2.0–3.0	Soil	–	–	55	10.5	344
RE39-09-2119	39-604427	1.0–2.0	Soil	–	–	–	0.78 (J)	–
RE39-09-2121	39-604428	0.0–1.0	Soil	–	–	–	–	4.98
RE39-09-2123	39-604428	2.0–3.0	Qbo		3.91	–	–	–
RE39-09-2124	39-604429	0.0–1.0	Soil	–	–	–	–	–
RE39-09-2127	39-604430	0.0–1.0	Soil	–	–	3.75	0.207	5.64
RE39-09-2128	39-604430	1.0–2.0	Soil	0.201	–	4.37	0.302	9.37
RE39-09-2129	39-604430	2.0–3.0	Qbo		–	4.03	0.224	7.27
RE39-09-2130	39-604431	0.0–1.0	Soil	–	–	–	–	3.64
RE39-09-2131	39-604431	1.0–2.0	Soil	0.127	–	–	–	2.97
RE39-09-2133	39-604432	0.0–1.0	Soil	–	–	5.01	0.428	17.7
RE39-09-2134	39-604432	1.0–2.0	Soil	–	–	5.23	0.475	21.2
RE39-09-2135	39-604432	2.0–3.0	Qbo		–	6.46	0.592	32.6
RE39-09-2136	39-604433	0.0–1.0	Soil	–	–	–	–	3.22
RE39-09-2137	39-604433	1.0–2.0	Qbo		–	–	–	4.47
RE39-09-2138	39-604433	2.0–3.0	Qbo		–	5.24	0.282	11.1
RE39-09-2139	39-604434	0.0–1.0	Soil	–	–	5.54	0.487	16.3
RE39-09-2140	39-604434	1.0–2.0	Soil	–	–	2.6	–	5.86
RE39-09-2142	39-604435	0.0–1.0	Soil	–	–	–	–	4.35 (J-)
RE39-09-2145	39-604436	0.0–1.0	Soil	–	0.036951	–	–	2.63
RE39-09-2148	39-604437	0.0–1.0	Soil	–	–	7.3 (J)	0.9	56.2 (J)
RE39-09-2149	39-604437	1.0–2.0	Soil	–	–	–	–	11 (J)
RE39-09-2150	39-604437	2.0–3.0	Soil	–	–	3.43 (J)	0.296	12.5 (J)
RE39-09-2151	39-604438	0.0–1.0	Soil	–	–	–	–	4.44 (J)
RE39-09-2152	39-604438	1.0–2.0	Soil	–	–	–	–	2.33 (J)
RE39-09-2154	39-604439	0.0–1.0	Soil	–	–	–	–	3.48 (J)
RE39-09-2155	39-604439	1.0–2.0	Soil	–	2.35	–	–	4.62 (J)
RE39-09-2156	39-604439	2.0–3.0	Soil	–	–	3.76 (J)	0.275	9.06 (J)

Table 5.16-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Tritium	Uranium-234	Uranium-235/236	Uranium-238
RE39-09-2157	39-604440	0.0–1.0	Soil	–	–	2.81 (J)	0.283	11.4 (J)
RE39-09-2158	39-604440	1.0–2.0	Soil	–	–	–	–	3.09 (J)
RE39-09-2159	39-604440	2.0–3.0	Soil	–	–	–	–	3.4 (J)
RE39-09-2160	39-604441	0.0–1.0	Soil	–	–	–	–	6.6 (J)
RE39-09-2161	39-604441	1.0–2.0	Soil	–	–	3.28 (J)	0.264	9.24 (J)
RE39-09-2162	39-604441	2.0–3.0	Soil	–	–	3.09 (J)	–	9.14 (J)
RE39-09-2163	39-604442	0.0–1.0	Soil	–	–	4.86 (J)	0.627	26.7 (J)
RE39-09-2164	39-604442	1.0–2.0	Soil	–	–	10.2 (J)	1.12	58.6 (J)
RE39-09-2165	39-604442	2.0–3.0	Soil	–	–	7.08 (J)	1.08	48 (J)

Source: BVs/FVs from LANL (1998, 059730).

Notes: Units are pCi/g. Data qualifiers are defined in Appendix A.

[a] Applies only to samples from 0 to 1 ft bgs.

[b] na = Not available.

[c] – = If analyzed, sample result is less than BV/FV. If no BV/FV is available, analyte was not detected.

Table 5.16-5
Summary of COPCs by Media for SWMU 39-010

Soil	Sediment	Qbo
Inorganic COPCs		
Antimony	Nitrate	Aluminum
Beryllium	Perchlorate	Arsenic
Cadmium		Barium
Copper		Chromium
Lead		Copper
Mercury		Iron
Nitrate		Lead
Perchlorate		Magnesium
Zinc		Manganese
		Mercury
		Nickel
		Nitrate
		Perchlorate
		Vanadium
		Zinc
Organic COPCs		
Amino-2,6-dinitrotoluene[4-]	None	Aroclor-1254
Amino-4,6-dinitrotoluene[2-]		Aroclor-1260
Aroclor-1254		Butylbenzylphthalate
Aroclor-1260		Di-n-butylphthalate
Benzo(a)anthracene		HMX
Benzo(a)pyrene		RDX
Benzo(b)fluoranthene		Trinitrotoluene[2,4,6-]
Benzo(g,h,i)perylene		
Benzo(k)fluoranthene		
Bis(2-ethylhexyl)phthalate		
Chloromethane		
Chrysene		
Di-n-butylphthalate		
Fluoranthene		
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]		
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]		
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]		
Hexachlorodibenzodioxin[1,2,3,4,7,8-]		
Hexachlorodibenzodioxin[1,2,3,6,7,8-]		
Hexachlorodibenzodioxin[1,2,3,7,8,9-]		
Hexachlorodibenzofuran[1,2,3,4,7,8-]		

Table 5.16-5 (continued)

Soil	Sediment	Qbo
Hexachlorodibenzofuran[1,2,3,6,7,8-]		
Hexachlorodibenzofuran[1,2,3,7,8,9-]		
Hexachlorodibenzofuran[2,3,4,6,7,8-]		
Hexanone[2-]		
HMX		
Indeno(1,2,3-cd)pyrene		
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]		
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]		
Pentachlorodibenzofuran[1,2,3,7,8-]		
Pentachlorodibenzofuran[2,3,4,7,8-]		
Phenanthrene		
Pyrene		
RDX		
Trimethylbenzene[1,3,5-]		
Trinitrotoluene[2,4,6-]		
Radionuclide COPCs		
Cesium-137	None	Tritium
Tritium		Uranium-234
Uranium-234		Uranium-235/236
Uranium-235/236		Uranium-238
Uranium-238		

Table 5.17-1
Summary of Samples Collected and Analyses Requested for the Extended Drainages

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-3662	39-604533	0.0–0.5	Soil	X[a]	X	–[b]	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3665	39-604533	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3663	39-604534	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3664	39-604534	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3667	39-604536	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3670	39-604536	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3671	39-604538	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3672	39-604538	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3673	39-604539	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3674	39-604539	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3676	39-604540	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3688	39-604540	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3677	39-604541	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3678	39-604541	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3679	39-604542	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3680	39-604542	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3681	39-604543	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3682	39-604543	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3683	39-604544	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3684	39-604544	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3685	39-604545	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3686	39-604545	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3689	39-604547	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X

Table 5.17-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-3690	39-604547	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3691	39-604548	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3692	39-604548	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3693	39-604549	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3694	39-604549	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3695	39-604550	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3696	39-604550	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3697	39-604551	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3698	39-604551	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3701	39-604553	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3702	39-604553	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3703	39-604554	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3704	39-604554	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3707	39-604555	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3706	39-604555	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3710	39-604557	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3713	39-604557	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3711	39-604558	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3712	39-604558	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3715	39-604560	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3723	39-604560	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3717	39-604561	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3718	39-604561	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3719	39-604562	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3720	39-604562	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X

Table 5.17-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-3721	39-604563	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3722	39-604563	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3726	39-604565	0.0–0.5	Soil	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3728	39-604565	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3729	39-604567	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3730	39-604567	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3731	39-604568	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3732	39-604568	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3733	39-604569	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3734	39-604569	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3735	39-604570	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3736	39-604570	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3738	39-604571	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3739	39-604571	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3741	39-604573	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3742	39-604573	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3743	39-604574	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3744	39-604574	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3746	39-604575	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3763	39-604575	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3747	39-604576	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3748	39-604576	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3751	39-604578	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3752	39-604578	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3753	39-604579	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X

Table 5.17-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-3754	39-604579	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3755	39-604580	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3756	39-604580	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3757	39-604581	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3758	39-604581	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3759	39-604582	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3760	39-604582	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3765	39-604585	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3766	39-604585	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3767	39-604586	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3768	39-604586	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3769	39-604587	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3770	39-604587	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3772	39-604588	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3781	39-604588	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3773	39-604589	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3774	39-604589	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3775	39-604590	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3776	39-604590	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3777	39-604591	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3778	39-604591	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3779	39-604592	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3780	39-604592	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3783	39-604594	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3784	39-604594	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X

Table 5.17-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-3785	39-604595	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3786	39-604595	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3789	39-604597	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3790	39-604597	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3791	39-604598	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3792	39-604598	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3793	39-604599	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3817	39-604599	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3795	39-604600	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3796	39-604600	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3797	39-604601	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3798	39-604601	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3799	39-604602	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3800	39-604602	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3801	39-604603	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3802	39-604603	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3803	39-604604	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3804	39-604604	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3805	39-604605	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3806	39-604605	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3807	39-604606	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3808	39-604606	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3809	39-604607	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3810	39-604607	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3811	39-604608	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X

Table 5.17-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-3812	39-604608	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3813	39-604609	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3814	39-604609	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3815	39-604610	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3816	39-604610	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3826	39-604615	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3846	39-604615	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3827	39-604616	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3828	39-604616	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3829	39-604617	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3830	39-604617	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3831	39-604618	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3832	39-604618	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3833	39-604619	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3834	39-604619	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3835	39-604620	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3836	39-604620	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3837	39-604621	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3838	39-604621	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3839	39-604622	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3840	39-604622	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3841	39-604623	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3842	39-604623	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3843	39-604624	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3844	39-604624	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X

Table 5.17-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-3847	39-604626	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3848	39-604626	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3901	39-604653	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3902	39-604653	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3903	39-604654	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3904	39-604654	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3905	39-604655	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3906	39-604655	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3907	39-604656	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3908	39-604656	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3909	39-604657	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3910	39-604657	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3911	39-604658	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3912	39-604658	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3913	39-604659	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3914	39-604659	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3915	39-604660	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3916	39-604660	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3925	39-604665	0.0–0.5	Qbo	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3926	39-604665	0.5–1.0	Qbo	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3927	39-604666	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3928	39-604666	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3929	39-604667	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3930	39-604667	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3931	39-604668	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X

Table 5.17-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-3932	39-604668	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3937	39-604671	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	–	X
RE39-09-3938	39-604671	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3939	39-604672	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3940	39-604672	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3941	39-604673	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3942	39-604673	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3943	39-604674	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3944	39-604674	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3947	39-604676	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3948	39-604676	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3951	39-604678	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3952	39-604678	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3953	39-604679	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3954	39-604679	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3955	39-604680	0.0–0.5	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3956	39-604680	0.5–1.0	Sed	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3959	39-604682	0.0–0.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-3960	39-604682	0.5–1.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X

[a] X = Analysis was performed.

[b] – = Analysis not requested.

Table 5.17-2
Summary of Inorganic Chemicals above BVs in the Extended Drainages

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Sed Background Value				**0.83**	**0.56**	**1.31**	**0.4**	**10.5**	**4.73**	**11.2**	**0.82**	**13800**	**19.7**	**0.1**	**9.38**	**na**[a]	**na**	**0.3**	**19.7**	**60.2**
Soil Background Value				**0.83**	**8.17**	**1.83**	**0.4**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Qbo Background Value				**0.5**	**0.56**	**1.44**	**0.4**	**2.6**	**8.89**	**3.96**	**0.5**	**3700**	**13.5**	**0.1**	**2**	**na**	**na**	**0.3**	**4.59**	**40**
RE39-09-3662	39-604533	0.0–0.5	Soil	–[b]	1 (U)	–	–	–	–	–	–	–	–	0.163	–	0.24	–	–	–	–
RE39-09-3665	39-604533	0.5–1.0	Soil	–		–	–	–	–	–	0.52 (U)	–	–	–	–	0.3	–	–	–	–
RE39-09-3663	39-604534	0.0–0.5	Sed	1.09 (U)		–	0.547 (U)	–	–	–	–	–	–	–	–	2.16	0.00166 (J)	1.11 (U)	–	–
RE39-09-3664	39-604534	0.5–1.0	Sed	1.12 (U)		–	0.558 (U)	–	–	–	–	–	–	–	–	2.13	0.000999 (J)	1.1 (U)	–	–
RE39-09-3667	39-604536	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	–	–	2.5	–	0.51 (U)	–	–
RE39-09-3670	39-604536	0.5–1.0	Sed	–		–	–	–	–	–	–	–	–	–	–	0.87	0.0027 (J)	0.52 (U)	–	–
RE39-09-3671	39-604538	0.0–0.5	Sed	1.17 (UJ)		–	0.587 (U)	–	–	–	–	–	–	–	–	5.98	0.00237 (J)	1.13 (U)	–	–
RE39-09-3672	39-604538	0.5–1.0	Sed	1.13 (UJ)		–	–	–	–	–	–	–	–	–	–	3.59	0.00115 (J)	1.11 (U)	–	–
RE39-09-3673	39-604539	0.0–0.5	Sed	1.1 (UJ)		–	0.551 (U)	–	–	–	–	–	–	–	–	1.61	–	1.1 (U)	–	–
RE39-09-3674	39-604539	0.5–1.0	Sed	1.07 (UJ)		–	0.534 (U)	–	–	–	–	–	–	–	–	1.46	–	1.08 (U)	–	–
RE39-09-3676	39-604540	0.0–0.5	Soil	–		–	–	–	–	–	–	–	–	–	–	0.16 (J)	–	–	–	–
RE39-09-3688	39-604540	0.5–1.0	Soil	–		–	–	–	–	–	–	–	–	–	–	0.21	–	–	–	–
RE39-09-3677	39-604541	0.0–0.5	Sed	1.11 (UJ)		–	0.555 (U)	–	–	–	–	–	–	–	–	0.938 (J)	0.000621 (J)	1.11 (U)	–	–
RE39-09-3678	39-604541	0.5–1.0	Sed	1.08 (UJ)		–	0.542 (U)	–	–	–	–	–	–	–	–	1.07 (J)	–	1.06 (U)	–	–
RE39-09-3679	39-604542	0.0–0.5	Sed	1.04 (UJ)		–	0.522 (U)	–	–	–	–	–	–	–	–	1.79	–	1.04 (U)	–	–
RE39-09-3680	39-604542	0.5–1.0	Sed	1.04 (UJ)		–	0.518 (U)	–	–	–	–	–	–	–	–	1.65	–	1.04 (U)	–	–
RE39-09-3681	39-604543	0.0–0.5	Sed	1.02 (UJ)		–	0.51 (U)	–	–	–	–	–	–	–	–	1.24	–	1.01 (U)	–	–
RE39-09-3682	39-604543	0.5–1.0	Sed	1.04 (UJ)		–	0.519 (U)	–	–	–	–	–	–	–	–	1.58	–	1.09 (U)	–	–
RE39-09-3683	39-604544	0.0–0.5	Sed	1.03 (U)		–	0.516 (U)	–	–	–	–	–	–	–	–	0.869 (J)	–	1.05 (U)	–	–
RE39-09-3684	39-604544	0.5–1.0	Sed	1.11 (U)		–	0.556 (U)	–	–	–	–	–	–	–	–	0.949 (J)	0.00077 (J)	1.1 (U)	–	–
RE39-09-3685	39-604545	0.0–0.5	Sed	1.04 (U)		–	0.522 (U)	–	–	–	–	–	–	–	–	1.18	–	0.999 (U)	–	–
RE39-09-3686	39-604545	0.5–1.0	Sed	1.01 (U)		–	0.506 (U)	–	–	–	–	–	–	–	–	1.13	–	0.999 (U)	–	–
RE39-09-3689	39-604547	0.0–0.5	Sed	1.06 (U)		–	0.532 (U)	–	–	–	–	–	–	–	–	2.14	0.002 (J)	1.09 (U)	–	–
RE39-09-3690	39-604547	0.5–1.0	Sed	1.05 (U)		–	0.527 (U)	–	–	–	–	–	–	–	–	1.28	0.002 (J)	1.06 (U)	–	–
RE39-09-3691	39-604548	0.0–0.5	Sed	1.02 (U)		–	0.512 (U)	–	–	–	–	–	–	–	–	1.38	–	1.04 (U)	–	–
RE39-09-3692	39-604548	0.5–1.0	Sed	1.02 (U)		–	0.508 (U)	–	–	–	–	–	–	–	–	0.742 (J)	–	1.02 (U)	–	–
RE39-09-3693	39-604549	0.0–0.5	Sed	1.02 (U)		–	0.512 (U)	–	–	–	–	–	–	–	–	0.702 (J)	–	1.03 (U)	–	–
RE39-09-3694	39-604549	0.5–1.0	Sed	1.03 (U)		–	0.514 (U)	–	–	–	–	–	–	–	–	0.834 (J)	–	1.04 (U)	–	–
RE39-09-3695	39-604550	0.0–0.5	Sed	1.16 (U)		–	0.58 (U)	–	–	13.8	–	–	–	0.259	–	1.58	–	1.18 (U)	–	–
RE39-09-3696	39-604550	0.5–1.0	Sed	1.11 (U)		–	0.553 (U)	–	–	–	–	–	–	0.172	–	1.24	0.000583 (J)	1.15 (U)	–	–
RE39-09-3697	39-604551	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	0.252 (J-)	–	0.73	–	0.55 (U)	–	–
RE39-09-3698	39-604551	0.5–1.0	Sed	–		–	–	–	–	–	–	–	–	0.177 (J-)	–	0.49	–	–	–	–

Table 5.17-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
RE39-09-3701	39-604553	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	–	–	1.4	0.0051 (J)	0.52 (U)	–	–
RE39-09-3702	39-604553	0.5–1.0	Sed	–		–	–	–	–	–	–	–	–	–	–	0.98	–	0.53 (U)	–	–
RE39-09-3703	39-604554	0.0–0.5	Sed	–		–	–	–	–	12	–	–	–	0.442 (J-)	–	2.9	–	–	–	–
RE39-09-3704	39-604554	0.5–1.0	Sed	–		–	–	–	–	11.9	–	–	–	0.501 (J-)	–	2.6	0.02	–	–	–
RE39-09-3707	39-604555	0.0–0.5	Soil	–		–	–	–	–	–	–	–	–	–	–	0.3	–	–	–	–
RE39-09-3706	39-604555	0.5–1.0	Soil	–		–	–	–	–	–	–	–	–	–	–	0.62	–	–	–	58.5
RE39-09-3710	39-604557	0.0–0.5	Soil	–		–	–	–	–	–	–	–	–	–	–	1.5	0.0044 (J)	–	–	–
RE39-09-3713	39-604557	0.5–1.0	Soil	–		–	–	–	–	–	–	–	–	–	–	1.2	–	–	–	–
RE39-09-3711	39-604558	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	–	–	0.81	–	0.52 (U)	–	–
RE39-09-3712	39-604558	0.5–1.0	Sed	–		–	–	–	–	–	–	–	–	–	–	0.6	–	0.53 (U)	–	–
RE39-09-3715	39-604560	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	–	–	0.63	–	0.5 (U)	–	–
RE39-09-3723	39-604560	0.5–1.0	Sed	–		–	–	–	–	–	–	–	–	–	–	0.98	–	0.51 (U)	–	–
RE39-09-3717	39-604561	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	–	–	0.4	–	0.52 (U)	–	–
RE39-09-3718	39-604561	0.5–1.0	Sed	–		–	–	–	–	–	–	–	–	–	–	0.39	–	–	–	–
RE39-09-3719	39-604562	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	–	–	1.1	–	–	–	–
RE39-09-3720	39-604562	0.5–1.0	Sed	–		–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
RE39-09-3721	39-604563	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	–	–	0.67	–	0.52 (U)	–	–
RE39-09-3722	39-604563	0.5–1.0	Sed	–		–	–	–	–	–	–	–	–	–	–	0.73	–	0.53 (U)	–	–
RE39-09-3726	39-604565	0.0–0.5	Soil	–		–	–	–	–	–	–	–	–	–	–	0.11 (J)	0.0035 (J)	–	–	–
RE39-09-3728	39-604565	0.5–1.0	Soil	–		–	–	–	–	986	0.51 (U)	–	–	–	–	0.36	–	–	–	–
RE39-09-3729	39-604567	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	–	–	1.1	–	0.52 (U)	–	–
RE39-09-3730	39-604567	0.5–1.0	Sed	–		–	–	–	–	–	–	–	–	–	–	0.85	–	0.53 (U)	–	–
RE39-09-3731	39-604568	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	–	–	0.59	–	0.54 (U)	–	–
RE39-09-3732	39-604568	0.5–1.0	Sed	–		–	–	–	–	–	–	–	–	–	–	2.7	–	0.58 (U)	–	–
RE39-09-3733	39-604569	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	–	–	0.98	–	0.52 (U)	–	–
RE39-09-3734	39-604569	0.5–1.0	Sed	–		–	–	–	–	–	–	–	–	–	–	0.98	–	0.55 (U)	–	–
RE39-09-3735	39-604570	0.0–0.5	Sed	0.977 (U)		–	0.489 (U)	–	–	–	–	–	–	–	–	0.834 (J)	–	0.968 (U)	–	–
RE39-09-3736	39-604570	0.5–1.0	Sed	1.03 (U)		–	0.517 (U)	–	–	–	–	–	–	–	–	0.885 (J)	–	1.02 (U)	–	–
RE39-09-3738	39-604571	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	–	–	0.11 (J)	–	0.5 (U)	–	–
RE39-09-3739	39-604571	0.5–1.0	Sed	–		–	–	–	–	–	–	17900	–	–	–	0.078 (J)	–	0.5 (U)	25.1	75.7
RE39-09-3741	39-604573	0.0–0.5	Sed	1.11 (U)		–	0.555 (U)	–	–	–	–	–	–	–	–	3.9	0.000587 (J)	1.09 (U)	–	–
RE39-09-3742	39-604573	0.5–1.0	Sed	1.1 (U)		–	0.548 (U)	–	–	–	–	–	–	–	–	3.45	–	1.11 (U)	–	–
RE39-09-3743	39-604574	0.0–0.5	Sed	1.05 (U)		–	0.525 (U)	–	–	–	–	–	–	–	–	1.3	–	1.05 (U)	–	–
RE39-09-3744	39-604574	0.5–1.0	Sed	1.09 (U)		–	0.547 (U)	–	–	–	–	–	–	–	–	2.12	–	1.08 (U)	–	–
RE39-09-3746	39-604575	0.0–0.5	Soil	–		–	–	–	–	–	–	–	–	–	–	0.38	–	–	–	–
RE39-09-3763	39-604575	0.5–1.0	Soil	–		–	–	–	–	–	–	–	–	–	–	0.42	–	–	–	–

Table 5.17-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
RE39-09-3747	39-604576	0.0–0.5	Sed	1.03 (U)		–	0.513 (U)	–	–	–	–	–	–	–	–	0.802 (J)	–	1.03 (U)	–	–
RE39-09-3748	39-604576	0.5–1.0	Sed	1.04 (U)		–	0.521 (U)	–	–	–	–	–	–	–	–	0.81 (J)	–	1.02 (U)	–	–
RE39-09-3751	39-604578	0.0–0.5	Sed	1.14 (U)		–	0.569 (U)	–	–	–	–	–	–	–	–	10.6	0.00109 (J)	1.15 (U)	–	–
RE39-09-3752	39-604578	0.5–1.0	Sed	1.15 (U)		–	0.574 (U)	–	–	–	–	–	–	–	–	6.01	–	1.14 (U)	–	–
RE39-09-3753	39-604579	0.0–0.5	Soil	1.18 (U)		–	–	–	–	–	–	–	–	–	–	2.78	–	–	–	–
RE39-09-3754	39-604579	0.5–1.0	Soil	1.16 (U)		–	0.58 (U)	–	–	–	–	–	–	–	–	2.64	–	–	–	–
RE39-09-3755	39-604580	0.0–0.5	Sed	1.09 (U)		–	0.544 (U)	–	–	–	–	–	–	–	–	0.968 (J)	–	1.05 (U)	–	–
RE39-09-3756	39-604580	0.5–1.0	Sed	1.02 (U)		–	0.509 (U)	–	–	–	–	–	–	–	–	1.18	–	1.05 (U)	–	–
RE39-09-3757	39-604581	0.0–0.5	Sed	1.08 (U)		–	0.538 (U)	–	–	–	–	–	–	–	–	1.79	–	1.05 (U)	–	–
RE39-09-3758	39-604581	0.5–1.0	Sed	1.14 (U)		–	0.568 (U)	–	–	–	–	–	–	–	–	1.56	–	1.15 (U)	–	–
RE39-09-3759	39-604582	0.0–0.5	Soil	1.15 (U)		–	0.576 (U)	–	–	–	–	–	–	–	–	1.84	–	–	–	–
RE39-09-3760	39-604582	0.5–1.0	Soil	1.1 (U)		–	0.551 (U)	–	–	–	–	–	–	–	–	1.42	0.000673 (J)	–	–	–
RE39-09-3765	39-604585	0.0–0.5	Sed	0.986 (U)		–	0.493 (U)	–	–	–	–	–	–	–	–	0.813 (J)	–	1.01 (U)	–	–
RE39-09-3766	39-604585	0.5–1.0	Sed	1.03 (U)		–	0.513 (U)	–	–	–	–	–	–	–	–	0.802 (J)	–	1.03 (U)	–	–
RE39-09-3767	39-604586	0.0–0.5	Soil	1.07 (U)		–	0.536 (U)	–	–	–	–	–	–	0.117	–	4.16	0.00126 (J)	–	–	–
RE39-09-3768	39-604586	0.5–1.0	Soil	1.11 (U)		–	0.555 (U)	–	–	–	–	–	–	–	–	3.71	0.00185 (J)	–	–	–
RE39-09-3769	39-604587	0.0–0.5	Sed	1.08 (U)		–	0.538 (U)	–	–	–	–	–	–	–	–	1.71	–	1.05 (U)	–	–
RE39-09-3770	39-604587	0.5–1.0	Sed	1.09 (U)		–	0.544 (U)	–	–	–	–	–	–	–	–	1.79	–	1.11 (U)	–	–
RE39-09-3772	39-604588	0.0–0.5	Soil	–		–	–	–	–	–	–	–	29.3	0.126	–	1.5	–	–	–	53.6
RE39-09-3781	39-604588	0.5–1.0	Soil	–		–	–	–	–	–	–	–	–	–	–	2.2 (J)	–	–	–	56.9 (J+)
RE39-09-3773	39-604589	0.0–0.5	Sed	1 (U)		–	0.501 (U)	–	–	–	–	–	–	–	–	0.917 (J)	–	1.04 (U)	–	–
RE39-09-3774	39-604589	0.5–1.0	Sed	1.06 (U)		–	0.531 (U)	–	–	–	–	–	–	–	–	0.903 (J)	–	1.04 (U)	–	–
RE39-09-3775	39-604590	0.0–0.5	Soil	1.06 (U)		–	0.53 (U)	–	–	–	–	–	–	–	–	2.38	0.000998 (J)	–	–	–
RE39-09-3776	39-604590	0.5–1.0	Soil	1.06 (U)		–	0.531 (U)	–	–	–	–	–	–	–	–	2.37	0.0007 (J)	–	–	–
RE39-09-3777	39-604591	0.0–0.5	Soil	1.26 (UJ)		–	–	–	–	–	–	–	–	–	–	2.38 (J-)	0.00148 (J)	NA[c]	–	–
RE39-09-3778	39-604591	0.5–1.0	Soil	1.05 (UJ)		–	0.526 (U)	–	–	–	–	–	–	–	–	1.1 (J-)	–	NA	–	–
RE39-09-3779	39-604592	0.0–0.5	Sed	5.37 (UJ)		–	–	–	–	–	–	24100	–	–	–	0.636 (J-)	–	NA	28.1	95.4
RE39-09-3780	39-604592	0.5–1.0	Sed	1.03 (UJ)		–	0.513 (U)	–	–	–	–	–	–	–	–	–	–	NA	–	–
RE39-09-3783	39-604594	0.0–0.5	Soil	1.16 (UJ)		–	–	–	–	–	–	–	–	–	–	1.46 (J-)	–	NA	–	–
RE39-09-3784	39-604594	0.5–1.0	Soil	1.17 (UJ)		–	0.583 (U)	–	–	–	–	–	–	–	–	1.05 (J-)	–	NA	–	–
RE39-09-3785	39-604595	0.0–0.5	Soil	1.17 (UJ)		–	0.584 (U)	–	–	–	–	–	–	–	–	1.08 (J-)	–	NA	–	–
RE39-09-3786	39-604595	0.5–1.0	Soil	1.2 (UJ)		–	0.598 (U)	–	–	–	–	–	–	–	–	0.879 (J-)	–	NA	–	–
RE39-09-3789	39-604597	0.0–0.5	Sed	0.996 (UJ)		–	0.498 (U)	–	–	199 (J+)	–	–	–	–	–	0.818 (J)	–	1.02 (U)	–	–
RE39-09-3790	39-604597	0.5–1.0	Sed	0.993 (UJ)		–	0.496 (U)	–	–	–	–	–	–	–	–	0.684 (J-)	–	NA	–	–
RE39-09-3791	39-604598	0.0–0.5	Soil	1.23 (UJ)		–	–	–	–	21.8	–	–	–	–	–	2.33 (J-)	–	NA	–	55.7
RE39-09-3792	39-604598	0.5–1.0	Soil	1.05 (UJ)		–	–	–	–	–	–	–	–	–	–	0.865 (J-)	–	NA	–	52.7

Table 5.17-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
RE39-09-3793	39-604599	0.0–0.5	Soil	–		–	–	–	–	–	–	–	–	–	–	7.3 (J)	–	–	–	–
RE39-09-3817	39-604599	0.5–1.0	Soil	–		–	–	–	–	–	0.54 (U)	–	–	–	–	13.1 (J)	–	–	–	–
RE39-09-3795	39-604600	0.0–0.5	Soil	1.15 (UJ)		–	–	–	–	24.3 (J+)	–	–	–	–	–	3.33	0.001 (J)	–	–	–
RE39-09-3796	39-604600	0.5–1.0	Soil	1.14 (UJ)		–	–	–	–	40.8 (J+)	–	–	–	–	–	2.34	0.00071 (J)	–	–	54.5
RE39-09-3797	39-604601	0.0–0.5	Sed	0.987 (UJ)		–	0.494 (U)	–	–	–	–	–	–	–	–	0.893 (J-)	–	NA	–	–
RE39-09-3798	39-604601	0.5–1.0	Sed	1.01 (UJ)		–	0.504 (U)	–	–	–	–	–	–	–	–	1.2	–	1.04 (U)	–	–
RE39-09-3799	39-604602	0.0–0.5	Soil	1.07 (UJ)		–	0.534 (U)	–	–	–	–	–	–	–	–	4.38 (J-)	0.00365 (J)	NA	–	–
RE39-09-3800	39-604602	0.5–1.0	Soil	1.06 (UJ)		–	–	–	–	–	–	–	–	–	–	2.5 (J-)	0.00407 (J)	NA	–	–
RE39-09-3801	39-604603	0.0–0.5	Soil	1.15 (UJ)		–	0.576 (U)	–	–	35.2 (J+)	–	–	–	0.247	–	2.3	–	–	–	–
RE39-09-3802	39-604603	0.5–1.0	Soil	1.18 (UJ)		–	–	–	–	58.6	–	–	–	0.343	–	1.7 (J-)	0.000715 (J)	NA	–	–
RE39-09-3803	39-604604	0.0–0.5	Sed	1.06 (UJ)		–	0.531 (U)	–	–	–	–	–	–	0.132	–	0.822 (J-)	–	NA	–	–
RE39-09-3804	39-604604	0.5–1.0	Sed	1.03 (UJ)		–	0.517 (U)	–	–	–	–	–	–	–	–	0.968 (J)	–	1.02 (U)	–	–
RE39-09-3805	39-604605	0.0–0.5	Soil	1.14 (UJ)		–	0.569 (U)	–	–	–	–	–	–	0.194	–	2.31 (J-)	0.000781 (J)	NA	–	–
RE39-09-3806	39-604605	0.5–1.0	Soil	1.12 (UJ)		–	0.562 (U)	–	–	–	–	–	–	0.191	–	3.04	–	–	–	–
RE39-09-3807	39-604606	0.0–0.5	Soil	5.68 (UJ)		–	0.568 (U)	652	–	157	–	–	23.2	28.2	–	0.671 (J-)	–	NA	–	76.6
RE39-09-3808	39-604606	0.5–1.0	Soil	1.14 (UJ)		–	0.571 (U)	–	–	75.4 (J+)	–	–	–	19.9	–	0.815 (J)	0.000652 (J)	–	–	66.5
RE39-09-3809	39-604607	0.0–0.5	Sed	1.05 (UJ)		–	0.526 (U)	–	–	–	–	–	–	0.127	–	0.664 (J-)	–	NA	–	–
RE39-09-3810	39-604607	0.5–1.0	Sed	1.09 (UJ)		–	0.544 (U)	–	–	–	–	–	–	0.403	–	2.58	–	1.13 (U)	–	–
RE39-09-3811	39-604608	0.0–0.5	Soil	1.05 (UJ)		–	–	30.6	–	76.4 (J+)	–	–	–	2.33	–	1.96	–	–	–	86.8
RE39-09-3812	39-604608	0.5–1.0	Soil	1.05 (UJ)		–	0.523 (U)	–	–	63.1	–	–	–	3.38	–	2.51 (J-)	–	NA	–	79.6
RE39-09-3813	39-604609	0.0–0.5	Sed	1.05 (U)		–	0.525 (U)	–	–	–	–	–	–	0.139	–	1.45	–	1.04 (U)	–	–
RE39-09-3814	39-604609	0.5–1.0	Sed	1.05 (U)		–	0.526 (U)	–	–	–	–	–	–	0.103	–	1.24	0.000724 (J)	1.03 (U)	–	–
RE39-09-3815	39-604610	0.0–0.5	Sed	1.02 (U)		–	0.512 (U)	–	–	–	–	–	–	–	–	1.41	–	1 (U)	–	–
RE39-09-3816	39-604610	0.5–1.0	Sed	1.03 (U)		–	0.517 (U)	–	–	–	–	–	–	–	–	1.1	–	1.02 (U)	–	–
RE39-09-3826	39-604615	0.0–0.5	Soil	–		–	–	–	–	–	–	–	–	–	–	0.8 (J)	–	–	–	–
RE39-09-3846	39-604615	0.5–1.0	Soil	–		–	–	–	–	–	0.53 (U)	–	–	–	–	2.5 (J)	–	–	–	–
RE39-09-3827	39-604616	0.0–0.5	Soil	–		–	–	–	25.6	27.4	–	–	–	0.386	17.8 (J)	3.5	–	–	–	–
RE39-09-3828	39-604616	0.5–1.0	Soil	–		–	–	–	–	20.3	–	–	–	0.493	–	1.5	–	–	–	–
RE39-09-3829	39-604617	0.0–0.5	Soil	–		–	–	–	–	27.1	0.52 (U)	–	–	0.602	–	2	–	–	–	–
RE39-09-3830	39-604617	0.5–1.0	Soil	–		–	–	–	–	24.5	–	–	–	0.697	–	1.2	–	–	–	–
RE39-09-3831	39-604618	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	–	–	0.62	–	0.5 (U)	–	–
RE39-09-3832	39-604618	0.5–1.0	Sed	–		–	–	–	–	163	–	–	–	–	–	1.2	–	0.52 (U)	–	–
RE39-09-3833	39-604619	0.0–0.5	Soil	–		–	–	–	–	26.9	0.51 (U)	–	–	0.687	–	1	–	–	–	–
RE39-09-3834	39-604619	0.5–1.0	Soil	–		–	–	–	–	32.7	0.53 (U)	–	–	0.556	–	0.74	–	–	–	–
RE39-09-3835	39-604620	0.0–0.5	Sed	–		–	–	–	–	1650	–	–	–	–	–	0.14 (J)	–	–	–	–
RE39-09-3836	39-604620	0.5–1.0	Sed	–		–	–	–	–	33.4	–	–	–	–	–	0.6	–	0.53 (U)	–	–

Table 5.17-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
RE39-09-3837	39-604621	0.0–0.5	Soil	–		–	–	–	–	26.6	–	–	–	1.36	–	1.4	–	–	–	–
RE39-09-3838	39-604621	0.5–1.0	Soil	–		–	–	–	–	31.5	–	–	–	1.51	–	1.9	–	–	–	–
RE39-09-3839	39-604622	0.0–0.5	Soil	–		–	–	–	–	–	0.51 (U)	–	–	–	–	0.33	–	–	–	–
RE39-09-3840	39-604622	0.5–1.0	Soil	–		–	–	–	–	–	0.54 (U)	–	–	0.114	–	1.4	–	–	–	–
RE39-09-3841	39-604623	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	–	–	1.1	–	0.5 (U)	–	–
RE39-09-3842	39-604623	0.5–1.0	Sed	–		–	–	–	–	–	–	–	–	–	–	1.8	–	0.51 (U)	–	–
RE39-09-3843	39-604624	0.0–0.5	Soil	–		–	–	–	–	–	–	–	–	–	–	0.3	–	–	–	–
RE39-09-3844	39-604624	0.5–1.0	Soil	–		–	–	–	–	–	–	–	–	–	–	0.96	–	–	–	–
RE39-09-3847	39-604626	0.0–0.5	Soil	–		–	–	–	–	–	–	–	–	–	–	13.2	–	–	–	–
RE39-09-3848	39-604626	0.5–1.0	Soil	–		–	0.72	–	–	–	0.55 (U)	–	–	0.285	–	5.7	–	–	–	–
RE39-09-3901	39-604653	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	–	–	2.9	–	–	–	–
RE39-09-3902	39-604653	0.5–1.0	Sed	–		–	–	–	–	–	–	–	–	–	–	1.7	–	–	–	–
RE39-09-3903	39-604654	0.0–0.5	Soil	–		–	0.92	–	–	–	–	–	–	0.696	–	4.2	–	–	–	–
RE39-09-3904	39-604654	0.5–1.0	Soil	–		–	0.44	–	–	–	–	–	33.8	0.481 (J)	–	3.3	–	–	–	–
RE39-09-3905	39-604655	0.0–0.5	Soil	–		59.6 (J)	–	–	–	68.2	–	–	112	1.69	–	2.3	0.0035 (J)	–	–	80
RE39-09-3906	39-604655	0.5–1.0	Soil	–		5.7	–	–	–	369	–	–	75.4	1.46	–	2.8	0.0022 (J)	–	–	77.5
RE39-09-3907	39-604656	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	–	–	0.52	–	0.5 (U)	–	–
RE39-09-3908	39-604656	0.5–1.0	Sed	–		–	–	–	–	–	–	–	–	–	–	0.71	–	0.51 (U)	–	–
RE39-09-3909	39-604657	0.0–0.5	Soil	–		–	–	–	–	–	–	–	–	0.185 (J)	–	0.86	–	–	–	–
RE39-09-3910	39-604657	0.5–1.0	Soil	–		–	–	–	–	21.7	0.53 (U)	–	23.6	0.487 (J)	–	0.55	–	–	–	–
RE39-09-3911	39-604658	0.0–0.5	Soil	–		–	–	–	–	–	–	–	–	–	–	1.6	–	–	–	–
RE39-09-3912	39-604658	0.5–1.0	Soil	–		–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
RE39-09-3913	39-604659	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	–	–	0.31	–	0.5 (U)	–	–
RE39-09-3914	39-604659	0.5–1.0	Sed	–		–	–	–	–	–	–	–	–	–	–	0.68	–	0.51 (U)	–	–
RE39-09-3915	39-604660	0.0–0.5	Soil	–		–	–	–	–	–	–	–	–	–	–	7.1	–	–	–	–
RE39-09-3916	39-604660	0.5–1.0	Soil	–		–	–	–	–	–	–	–	–	–	–	3.4	–	–	–	–
RE39-09-3925	39-604665	0.0–0.5	Qbo	0.51 (U)	1 (U)					4	0.51 (UJ)					0.59				
RE39-09-3926	39-604665	0.5–1.0	Qbo	0.52 (U)	1 (U)					5.1	0.52 (UJ)					2.4				
RE39-09-3927	39-604666	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	–	–	1.3	–	0.51 (U)	–	–
RE39-09-3928	39-604666	0.5–1.0	Sed	–		–	–	–	–	–	–	–	–	–	–	2.1	–	–	–	–
RE39-09-3929	39-604667	0.0–0.5	Soil	–		–	–	–	–	93.3	0.52 (UJ)	–	29.5	0.27 (J)	–	0.6	–	–	–	150
RE39-09-3930	39-604667	0.5–1.0	Soil	–		–	–	–	–	38.6	0.53 (UJ)	–	–	–	–	0.19 (J)	–	–	–	112
RE39-09-3931	39-604668	0.0–0.5	Soil	–		–	–	–	–	–	0.52 (UJ)	–	–	–	–	2.7	–	–	–	–
RE39-09-3932	39-604668	0.5–1.0	Soil	–		–	–	–	–	–	0.54 (UJ)	–	–	–	–	2.2	–	–	–	–
RE39-09-3937	39-604671	0.0–0.5	Soil	1.24 (U)		–	0.62 (U)	–	–	–	–	–	–	–	–	1.85	–	–	–	–
RE39-09-3938	39-604671	0.5–1.0	Soil	1.08 (U)		–	0.538 (U)	–	–	–	–	–	–	–	–	1.45	–	–	–	–

Table 5.17-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
RE39-09-3939	39-604672	0.0–0.5	Soil	–		–	–	–	–	–	–	–	–	0.277	–	–	–	–	–	–
RE39-09-3940	39-604672	0.5–1.0	Soil	–		–	–	–	–	–	0.52 (U)	–	–	0.462	–	–	–	–	–	–
RE39-09-3941	39-604673	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	–	–	2.4	–	0.52 (U)	–	–
RE39-09-3942	39-604673	0.5–1.0	Sed	–		–	–	–	–	23.6	–	–	–	–	–	1	–	–	–	–
RE39-09-3943	39-604674	0.0–0.5	Soil	–		–	–	–	–	20.4	–	–	–	–	–	1.9	–	–	–	–
RE39-09-3944	39-604674	0.5–1.0	Soil	–		–	–	–	–	24.4	–	–	–	–	–	2.4	–	–	–	–
RE39-09-3947	39-604676	0.0–0.5	Soil	–		–	–	–	–	–	–	–	–	–	–	0.56	–	–	–	–
RE39-09-3948	39-604676	0.5–1.0	Soil	–		–	–	–	–	–	–	–	–	–	–	0.21	–	–	–	–
RE39-09-3951	39-604678	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	–	–	0.41	–	0.5 (U)	–	–
RE39-09-3952	39-604678	0.5–1.0	Sed	–		–	–	–	–	–	–	–	–	–	–	0.2	–	0.51 (U)	–	–
RE39-09-3953	39-604679	0.0–0.5	Soil	–		–	–	–	–	–	–	–	–	–	–	0.28	–	–	–	–
RE39-09-3954	39-604679	0.5–1.0	Soil	–		–	–	–	–	–	–	–	–	–	–	0.49	–	–	–	–
RE39-09-3955	39-604680	0.0–0.5	Sed	–		–	–	–	–	–	–	–	–	–	–	–	–	0.5 (U)	–	67.1 (J+)
RE39-09-3956	39-604680	0.5–1.0	Sed	–		–	–	–	–	–	–	–	–	–	–	–	–	0.51 (U)	–	–
RE39-09-3959	39-604682	0.0–0.5	Soil	–		–	–	–	–	–	0.51 (U)	–	–	–	–	0.63 (J)	–	–	–	–
RE39-09-3960	39-604682	0.5–1.0	Soil	–		–	–	–	–	–	0.52 (U)	–	–	–	–	0.71 (J)	–	–	–	–

Source: BVs from LANL (1998, 059730).
Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.
[a] na = Not available.
[b] – = If analyzed, sample result is less than the BV.
[c] NA = Not analyzed.

Table 5.17-3
Summary of Organic Chemicals Detected in the Extended Drainages

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1242	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	Chloromethane	Chrysene
RE39-09-3662	39-604533	0.0–0.5	Soil	–[a]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3665	39-604533	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.00064 (J)	–
RE39-09-3663	39-604534	0.0–0.5	Sed	–	NA[b]	–	–	0.0055	–	–	–	–	–	–	–	NA	–	NA	–
RE39-09-3664	39-604534	0.5–1.0	Sed	–	–	–	0.007	0.0064	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3667	39-604536	0.0–0.5	Sed	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3670	39-604536	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.00032 (J)	–
RE39-09-3671	39-604538	0.0–0.5	Sed	–	NA	–	–	–	–	–	0.0146 (J)	–	0.0149 (J)	–	–	NA	–	NA	–
RE39-09-3678	39-604541	0.5–1.0	Sed	–	–	–	–	–	–	–	–	0.0122 (J)	–	–	–	–	–	–	–
RE39-09-3686	39-604545	0.5–1.0	Sed	–	–	–	–	0.0041	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3701	39-604553	0.0–0.5	Sed	–	NA	–	–	–	–	–	–	–	–	–	0.1 (J)	NA	–	NA	–
RE39-09-3702	39-604553	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–	–	0.24 (J)	–	–	–	–
RE39-09-3703	39-604554	0.0–0.5	Sed	–	NA	–	–	–	–	–	–	–	–	–	0.067 (J)	NA	–	NA	–
RE39-09-3710	39-604557	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3711	39-604558	0.0–0.5	Sed	–	NA	–	–	–	–	–	–	–	–	–	0.067 (J)	NA	–	NA	–
RE39-09-3712	39-604558	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3717	39-604561	0.0–0.5	Sed	–	NA	–	–	–	–	–	–	–	–	–	0.063 (J)	NA	0.077 (J)	NA	–
RE39-09-3718	39-604561	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–	–	–	0.00045 (J)	–	–	–
RE39-09-3720	39-604562	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3721	39-604563	0.0–0.5	Sed	–	NA	–	–	–	–	–	–	–	–	–	0.15 (J)	NA	–	NA	–
RE39-09-3722	39-604563	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–	–	0.56	–	0.12 (J)	–	–
RE39-09-3726	39-604565	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3732	39-604568	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–	–	0.13 (J)	–	–	–	–
RE39-09-3734	39-604569	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–	–	0.38	–	–	–	–
RE39-09-3736	39-604570	0.5–1.0	Sed	–	–	–	0.0017 (J)	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3738	39-604571	0.0–0.5	Sed	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3739	39-604571	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3743	39-604574	0.0–0.5	Sed	–	NA	–	–	0.0015 (J)	–	–	–	–	–	–	–	NA	–	NA	–

Table 5.17-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1242	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	Chloromethane	Chrysene
RE39-09-3744	39-604574	0.5–1.0	Sed	–	0.021 (J)	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3756	39-604580	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3757	39-604581	0.0–0.5	Sed	–	NA	–	0.0096	0.0077	–	–	–	–	–	–	–	NA	–	NA	–
RE39-09-3758	39-604581	0.5–1.0	Sed	–	–	–	0.0082	0.0066	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3765	39-604585	0.0–0.5	Sed	–	NA	–	–	–	–	–	–	–	–	–	–	NA	–	NA	–
RE39-09-3772	39-604588	0.0–0.5	Soil	–	–	–	–	–	–	0.13 (J)	0.15 (J+)	0.12 (J)	0.093 (J)	0.12 (J)	–	–	–	–	0.16 (J)
RE39-09-3781	39-604588	0.5–1.0	Soil	0.037 (J-)	–	0.052 (J-)	–	–	–	0.16 (J-)	0.18 (J-)	0.13 (J-)	0.094 (J-)	0.18 (J-)	0.078 (J-)	–	–	–	0.2 (J-)
RE39-09-3783	39-604594	0.0–0.5	Soil	–	NA	–	0.0048	0.0022 (J)	–	–	–	–	–	–	–	NA	–	NA	–
RE39-09-3790	39-604597	0.5–1.0	Sed	–	–	–	–	0.0019 (J)	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3791	39-604598	0.0–0.5	Soil	–	NA	–	–	0.0051	0.003 (J)	–	–	–	–	–	–	NA	–	NA	–
RE39-09-3792	39-604598	0.5–1.0	Soil	–	–	–	–	0.0044	0.0029 (J)	–	–	–	–	–	–	–	–	–	–
RE39-09-3793	39-604599	0.0–0.5	Soil	–	0.042 (J)	–	–	–	–	–	–	–	–	–	0.15 (J-)	–	–	–	–
RE39-09-3817	39-604599	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3795	39-604600	0.0–0.5	Soil	–	NA	–	–	0.012	0.0065	–	–	–	–	–	0.126 (J)	NA	–	NA	–
RE39-09-3796	39-604600	0.5–1.0	Soil	–	–	–	–	0.0398	0.0779	–	–	–	–	–	0.0835 (J)	–	–	–	–
RE39-09-3797	39-604601	0.0–0.5	Sed	–	NA	–	–	0.0018 (J)	–	–	–	–	–	–	–	NA	–	NA	–
RE39-09-3799	39-604602	0.0–0.5	Soil	–	NA	–	–	0.003 (J)	0.0019 (J)	–	–	–	–	–	–	NA	–	NA	–
RE39-09-3800	39-604602	0.5–1.0	Soil	–	–	–	–	0.003 (J)	0.0022 (J)	–	–	–	–	–	–	–	–	–	–
RE39-09-3801	39-604603	0.0–0.5	Soil	–	NA	–	–	–	–	–	–	–	–	–	0.102 (J)	NA	–	NA	–
RE39-09-3803	39-604604	0.0–0.5	Sed	–	NA	–	–	–	–	–	–	–	–	–	–	NA	–	NA	–
RE39-09-3804	39-604604	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–	–	0.0871 (J)	–	–	–	–
RE39-09-3806	39-604605	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	0.102 (J)	–	–	–	–
RE39-09-3811	39-604608	0.0–0.5	Soil	–	NA	–	–	–	–	–	–	–	–	–	0.0765 (J)	NA	–	NA	–
RE39-09-3826	39-604615	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3827	39-604616	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	0.25 (J)	–	–	–	–
RE39-09-3829	39-604617	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3830	39-604617	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3831	39-604618	0.0–0.5	Sed	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3832	39-604618	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3833	39-604619	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3834	39-604619	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	0.15 (J)	–	–	–	–
RE39-09-3835	39-604620	0.0–0.5	Sed	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3836	39-604620	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–	–	0.29 (J)	–	–	–	–

Table 5.17-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1242	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	Chloromethane	Chrysene
RE39-09-3837	39-604621	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	0.098 (J)	–	–	–	–
RE39-09-3838	39-604621	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3839	39-604622	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3841	39-604623	0.0–0.5	Sed	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3842	39-604623	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–	–	0.16 (J)	–	–	–	–
RE39-09-3843	39-604624	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3847	39-604626	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	0.082 (J)	–	–	–	–
RE39-09-3848	39-604626	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3901	39-604653	0.0–0.5	Sed	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3902	39-604653	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–	–	0.093 (J)	–	–	–	–
RE39-09-3903	39-604654	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3904	39-604654	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	0.11 (J)	–	–	–	–
RE39-09-3905	39-604655	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3906	39-604655	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3907	39-604656	0.0–0.5	Sed	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3908	39-604656	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3910	39-604657	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3911	39-604658	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3912	39-604658	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3913	39-604659	0.0–0.5	Sed	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3915	39-604660	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3925	39-604665	0.0–0.5	Qbo		–	–	–	–	–	–	–	–	–	–	0.39	–	–	–	–
RE39-09-3926	39-604665	0.5–1.0	Qbo		–	–	–	–	–	–	–	–	–	–	0.056 (J)	–	–	–	–
RE39-09-3928	39-604666	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–	–	0.51	–	–	–	–
RE39-09-3929	39-604667	0.0–0.5	Soil	–	–	–	–	0.038 (J)	0.023 (J)	–	–	–	–	–	0.24 (J)	–	–	–	–
RE39-09-3930	39-604667	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	0.34 (J)	–	–	–	–
RE39-09-3937	39-604671	0.0–0.5	Soil	–	NA	–	–	0.002 (J)	–	–	–	–	–	–	–	NA	–	NA	–
RE39-09-3938	39-604671	0.5–1.0	Soil	–	–	–	–	0.0016 (J)	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3939	39-604672	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3940	39-604672	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3941	39-604673	0.0–0.5	Sed	–	–	–	–	–	–	–	–	–	–	–	0.72	–	–	–	–
RE39-09-3942	39-604673	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–	–	0.13 (J)	–	–	–	–
RE39-09-3943	39-604674	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Table 5.17-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1242	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	Chloromethane	Chrysene
RE39-09-3944	39-604674	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.00054 (J)	–
RE39-09-3947	39-604676	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	0.12 (J)	–	–	–	–
RE39-09-3951	39-604678	0.0–0.5	Sed	–	–	–	–	–	–	–	–	–	–	–	0.37	–	–	–	–
RE39-09-3953	39-604679	0.0–0.5	Soil	–	0.01 (J)	–	–	–	–	–	–	–	–	–	0.36	–	–	–	–
RE39-09-3954	39-604679	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	0.51	–	–	–	–
RE39-09-3955	39-604680	0.0–0.5	Sed	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3956	39-604680	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-3959	39-604682	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–	–	0.068 (J-)	–	–	–	–
RE39-09-3960	39-604682	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	–	0.14 (J-)	–	–

Table 5.17-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-butylphthalate	Dibenz(a,h)anthracene	Dichlorobenzene[1,2-]	Dichlorobenzene[1,4-]	Dinitrotoluene[2,4-]	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	HMX	Indeno(1,2,3-cd)pyrene	Iodomethane	Isopropyltoluene[4-]	Methylene Chloride	Nitrotoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
RE39-09-3662	39-604533	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	–	0.00039 (J)	–	NA	NA	NA
RE39-09-3665	39-604533	0.5–1.0	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3663	39-604534	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	NA	NA	NA	–	NA	NA
RE39-09-3664	39-604534	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3667	39-604536	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	0.00047 (J)	–	–	–	NA	NA
RE39-09-3670	39-604536	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3671	39-604538	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	NA	NA	NA	–	NA	NA
RE39-09-3678	39-604541	0.5–1.0	Sed	–	–	–	–	–	0.0163 (J)	NA	–	–	–	–	–	–	NA	NA
RE39-09-3686	39-604545	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3701	39-604553	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	NA	NA	NA	NA	NA	NA
RE39-09-3702	39-604553	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	NA	NA	NA
RE39-09-3703	39-604554	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	NA	NA	NA	NA	NA	NA
RE39-09-3710	39-604557	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	–	0.0015 (J)	0.0025 (J)	NA	NA	NA
RE39-09-3711	39-604558	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	NA	NA	NA	NA	NA	NA
RE39-09-3712	39-604558	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3717	39-604561	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	NA	NA	NA	NA	NA	NA
RE39-09-3718	39-604561	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	0.0012 (J)	NA	NA	NA
RE39-09-3720	39-604562	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	0.23 (J)	NA	NA
RE39-09-3721	39-604563	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	NA	NA	NA	NA	NA	NA
RE39-09-3722	39-604563	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3726	39-604565	0.0–0.5	Soil	–	–	–	–	–	–	2.76E-06	–	–	–	0.0016 (J)	–	NA	0.000018 (J)	0.000001 (J)
RE39-09-3732	39-604568	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	NA	NA	NA
RE39-09-3734	39-604569	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3736	39-604570	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3738	39-604571	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	–	0.0015 (J)	–	NA	NA	NA
RE39-09-3739	39-604571	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	0.00079 (J)	–	–	NA	NA
RE39-09-3743	39-604574	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	NA	NA	NA	–	NA	NA
RE39-09-3744	39-604574	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3756	39-604580	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	0.00295 (J)	–	NA	NA

Table 5.17-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-butylphthalate	Dibenz(a,h)anthracene	Dichlorobenzene[1,2-]	Dichlorobenzene[1,4-]	Dinitrotoluene[2,4-]	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	HMX	Indeno(1,2,3-cd)pyrene	Iodomethane	Isopropyltoluene[4-]	Methylene Chloride	Nitrotoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
RE39-09-3757	39-604581	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	NA	NA	NA	–	NA	NA
RE39-09-3758	39-604581	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3765	39-604585	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	NA	NA	NA	–	NA	NA
RE39-09-3772	39-604588	0.0–0.5	Soil	–	–	–	–	–	0.31 (J)	NA	–	0.081 (J)	–	–	–	NA	NA	NA
RE39-09-3781	39-604588	0.5–1.0	Soil	–	0.036 (J-)	–	–	–	0.37 (J-)	NA	–	0.083 (J-)	–	–	–	–	NA	NA
RE39-09-3783	39-604594	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	NA	NA	NA	–	NA	NA
RE39-09-3790	39-604597	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3791	39-604598	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	NA	NA	NA	–	NA	NA
RE39-09-3792	39-604598	0.5–1.0	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3793	39-604599	0.0–0.5	Soil	–	–	–	–	–	0.05 (J-)	NA	–	–	–	0.0015 (J)	–	–	NA	NA
RE39-09-3817	39-604599	0.5–1.0	Soil	–	–	–	–	–	0.057 (J-)	NA	–	–	–	–	–	–	NA	NA
RE39-09-3795	39-604600	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	NA	NA	NA	–	NA	NA
RE39-09-3796	39-604600	0.5–1.0	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3797	39-604601	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	NA	NA	NA	–	NA	NA
RE39-09-3799	39-604602	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	NA	NA	NA	–	NA	NA
RE39-09-3800	39-604602	0.5–1.0	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3801	39-604603	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	NA	NA	NA	–	NA	NA
RE39-09-3803	39-604604	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	NA	NA	NA	–	NA	NA
RE39-09-3804	39-604604	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3806	39-604605	0.5–1.0	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3811	39-604608	0.0–0.5	Soil	0.0467 (J)	–	–	–	–	–	NA	0.192 (J)	–	NA	NA	NA	–	NA	NA
RE39-09-3826	39-604615	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	–	0.0023 (J)	–	–	NA	NA
RE39-09-3827	39-604616	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3829	39-604617	0.0–0.5	Soil	–	–	–	0.00059 (J)	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3830	39-604617	0.5–1.0	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3831	39-604618	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3832	39-604618	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3833	39-604619	0.0–0.5	Soil	–	–	–	0.00072 (J)	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3834	39-604619	0.5–1.0	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA

Table 5.17-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-butylphthalate	Dibenz(a,h)anthracene	Dichlorobenzene[1,2-]	Dichlorobenzene[1,4-]	Dinitrotoluene[2,4-]	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	HMX	Indeno(1,2,3-cd)pyrene	Iodomethane	Isopropyltoluene[4-]	Methylene Chloride	Nitrotoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
RE39-09-3835	39-604620	0.0–0.5	Sed	–	–	–	–	0.0037 (J)	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3836	39-604620	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3837	39-604621	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3838	39-604621	0.5–1.0	Soil	0.04 (J)	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3839	39-604622	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3841	39-604623	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3842	39-604623	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3843	39-604624	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3847	39-604626	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3848	39-604626	0.5–1.0	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3901	39-604653	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	–	0.0091	–	–	NA	NA
RE39-09-3902	39-604653	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3903	39-604654	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3904	39-604654	0.5–1.0	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3905	39-604655	0.0–0.5	Soil	–	–	–	–	–	–	NA	0.96	–	–	–	–	–	NA	NA
RE39-09-3906	39-604655	0.5–1.0	Soil	–	–	–	–	–	–	NA	0.24 (J-)	–	–	–	–	–	NA	NA
RE39-09-3907	39-604656	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3908	39-604656	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3910	39-604657	0.5–1.0	Soil	–	–	–	–	–	–	NA	0.059 (J-)	–	–	–	–	–	NA	NA
RE39-09-3911	39-604658	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3912	39-604658	0.5–1.0	Soil	–	–	–	–	–	–	NA	–	–	–	–	0.012	–	NA	NA
RE39-09-3913	39-604659	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3915	39-604660	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	–	–	0.0056	–	NA	NA
RE39-09-3925	39-604665	0.0–0.5	Qbo	–	–	–	–	–	–	NA	–	–	–	–	–	NA	NA	NA
RE39-09-3926	39-604665	0.5–1.0	Qbo	–	–	–	–	–	–	NA	–	–	–	–	–	NA	NA	NA
RE39-09-3928	39-604666	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3929	39-604667	0.0–0.5	Soil	0.17 (J)	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3930	39-604667	0.5–1.0	Soil	0.16 (J)	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3937	39-604671	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	NA	NA	NA	–	NA	NA

Table 5.17-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-butylphthalate	Dibenz(a,h)anthracene	Dichlorobenzene[1,2-]	Dichlorobenzene[1,4-]	Dinitrotoluene[2,4-]	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	HMX	Indeno(1,2,3-cd)pyrene	Iodomethane	Isopropyltoluene[4-]	Methylene Chloride	Nitrotoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
RE39-09-3938	39-604671	0.5–1.0	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3939	39-604672	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	NA	NA	NA
RE39-09-3940	39-604672	0.5–1.0	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	NA	NA	NA
RE39-09-3941	39-604673	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3942	39-604673	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3943	39-604674	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	0.00054 (J)	–	–	–	NA	NA
RE39-09-3944	39-604674	0.5–1.0	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3947	39-604676	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3951	39-604678	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3953	39-604679	0.0–0.5	Soil	–	–	0.00065 (J)	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3954	39-604679	0.5–1.0	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	–	NA	NA
RE39-09-3955	39-604680	0.0–0.5	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	NA	NA	NA
RE39-09-3956	39-604680	0.5–1.0	Sed	–	–	–	–	–	–	NA	–	–	–	–	–	NA	NA	NA
RE39-09-3959	39-604682	0.0–0.5	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	NA	NA	NA
RE39-09-3960	39-604682	0.5–1.0	Soil	–	–	–	–	–	–	NA	–	–	–	–	–	NA	NA	NA

Table 5.17-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	PETN	Phenanthrene	Pyrene	RDX	Styrene	TATB	Toluene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trinitrotoluene[2,4,6-]
RE39-09-3662	39-604533	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–
RE39-09-3665	39-604533	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–
RE39-09-3663	39-604534	0.0–0.5	Sed	–	–	–	–	NA	–	NA	NA	NA	–
RE39-09-3664	39-604534	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–
RE39-09-3667	39-604536	0.0–0.5	Sed	–	–	–	–	–	–	–	–	–	–
RE39-09-3670	39-604536	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–
RE39-09-3671	39-604538	0.0–0.5	Sed	–	–	–	–	NA	–	NA	NA	NA	–
RE39-09-3678	39-604541	0.5–1.0	Sed	–	–	0.0164 (J)	–	–	–	–	–	–	–
RE39-09-3686	39-604545	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–
RE39-09-3701	39-604553	0.0–0.5	Sed	–	–	–	–	NA	–	NA	NA	NA	NA
RE39-09-3702	39-604553	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	NA
RE39-09-3703	39-604554	0.0–0.5	Sed	–	–	–	–	NA	–	NA	NA	NA	NA
RE39-09-3710	39-604557	0.0–0.5	Soil	–	–	–	–	–	–	0.00071 (J)	–	–	–
RE39-09-3711	39-604558	0.0–0.5	Sed	–	–	–	–	NA	–	NA	NA	NA	–
RE39-09-3712	39-604558	0.5–1.0	Sed	–	–	–	–	–	–	–	0.0014 (J)	–	–
RE39-09-3717	39-604561	0.0–0.5	Sed	–	–	–	–	NA	–	NA	NA	NA	–
RE39-09-3718	39-604561	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	NA
RE39-09-3720	39-604562	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	NA
RE39-09-3721	39-604563	0.0–0.5	Sed	–	–	–	–	NA	–	NA	NA	NA	NA
RE39-09-3722	39-604563	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–
RE39-09-3726	39-604565	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–
RE39-09-3732	39-604568	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	NA
RE39-09-3734	39-604569	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–
RE39-09-3736	39-604570	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–
RE39-09-3738	39-604571	0.0–0.5	Sed	–	–	–	–	–	–	–	–	–	–
RE39-09-3739	39-604571	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–
RE39-09-3743	39-604574	0.0–0.5	Sed	–	–	–	–	NA	–	NA	NA	NA	–
RE39-09-3744	39-604574	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–
RE39-09-3756	39-604580	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–
RE39-09-3757	39-604581	0.0–0.5	Sed	–	–	–	–	NA	–	NA	NA	NA	–
RE39-09-3758	39-604581	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–
RE39-09-3765	39-604585	0.0–0.5	Sed	–	–	–	–	NA	11.6 (J)	NA	NA	NA	–
RE39-09-3772	39-604588	0.0–0.5	Soil	–	0.14 (J)	0.28 (J)	–	–	–	–	0.00038 (J)	–	–

Table 5.17-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	PETN	Phenanthrene	Pyrene	RDX	Styrene	TATB	Toluene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trinitrotoluene[2,4,6-]
RE39-09-3781	39-604588	0.5–1.0	Soil	–	0.23 (J-)	0.36 (J-)	–	–	–	–	–	0.0006 (J)	–
RE39-09-3783	39-604594	0.0–0.5	Soil	–	–	–	–	NA	–	NA	NA	NA	–
RE39-09-3790	39-604597	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–
RE39-09-3791	39-604598	0.0–0.5	Soil	–	–	–	–	NA	–	NA	NA	NA	–
RE39-09-3792	39-604598	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–
RE39-09-3793	39-604599	0.0–0.5	Soil	–	–	0.051 (J-)	–	–	–	0.002 (J)	–	–	–
RE39-09-3817	39-604599	0.5–1.0	Soil	–	–	0.065 (J-)	–	–	–	–	–	–	–
RE39-09-3795	39-604600	0.0–0.5	Soil	–	–	–	–	NA	–	NA	NA	NA	–
RE39-09-3796	39-604600	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–
RE39-09-3797	39-604601	0.0–0.5	Sed	–	–	–	–	NA	–	NA	NA	NA	–
RE39-09-3799	39-604602	0.0–0.5	Soil	–	–	–	–	NA	–	NA	NA	NA	–
RE39-09-3800	39-604602	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–
RE39-09-3801	39-604603	0.0–0.5	Soil	–	–	–	–	NA	–	NA	NA	NA	–
RE39-09-3803	39-604604	0.0–0.5	Sed	–	–	–	–	NA	0.597 (J)	NA	NA	NA	–
RE39-09-3804	39-604604	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–
RE39-09-3806	39-604605	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–
RE39-09-3811	39-604608	0.0–0.5	Soil	–	–	–	–	NA	–	NA	NA	NA	–
RE39-09-3826	39-604615	0.0–0.5	Soil	–	–	–	–	–	–	0.0015 (J)	–	0.00057 (J)	–
RE39-09-3827	39-604616	0.0–0.5	Soil	–	–	–	–	–	–	–	–	0.00074 (J)	–
RE39-09-3829	39-604617	0.0–0.5	Soil	–	–	–	–	–	–	0.0041 (J)	–	0.00058 (J)	–
RE39-09-3830	39-604617	0.5–1.0	Soil	–	–	–	–	–	–	–	–	0.00057 (J)	–
RE39-09-3831	39-604618	0.0–0.5	Sed	–	–	–	–	–	–	–	–	0.00052 (J)	–
RE39-09-3832	39-604618	0.5–1.0	Sed	–	–	–	–	–	–	–	–	0.00043 (J)	–
RE39-09-3833	39-604619	0.0–0.5	Soil	–	–	–	–	–	–	0.00075 (J)	–	0.00058 (J)	–
RE39-09-3834	39-604619	0.5–1.0	Soil	–	–	–	–	–	–	–	–	0.00054 (J)	–
RE39-09-3835	39-604620	0.0–0.5	Sed	–	–	–	–	–	–	0.00064 (J)	–	–	0.0056 (J)
RE39-09-3836	39-604620	0.5–1.0	Sed	–	–	–	–	–	–	–	–	0.00056 (J)	–
RE39-09-3837	39-604621	0.0–0.5	Soil	–	–	–	–	–	–	0.0018 (J)	–	–	–
RE39-09-3838	39-604621	0.5–1.0	Soil	–	–	–	–	–	–	–	–	0.00064 (J)	–
RE39-09-3839	39-604622	0.0–0.5	Soil	–	–	–	–	–	–	0.0014 (J)	–	–	–
RE39-09-3841	39-604623	0.0–0.5	Sed	–	–	–	–	–	–	–	–	0.00056 (J)	–
RE39-09-3842	39-604623	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–
RE39-09-3843	39-604624	0.0–0.5	Soil	–	–	–	–	–	–	0.0025 (J)	–	0.00057 (J)	–

Table 5.17-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	PETN	Phenanthrene	Pyrene	RDX	Styrene	TATB	Toluene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trinitrotoluene[2,4,6-]
RE39-09-3847	39-604626	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–
RE39-09-3848	39-604626	0.5–1.0	Soil	–	–	–	–	–	–	–	–	0.00046 (J)	–
RE39-09-3901	39-604653	0.0–0.5	Sed	–	–	–	–	–	–	0.0032 (J)	–	0.00072 (J)	–
RE39-09-3902	39-604653	0.5–1.0	Sed	–	–	–	–	–	–	–	–	0.00053 (J)	–
RE39-09-3903	39-604654	0.0–0.5	Soil	–	–	–	–	–	–	–	–	0.00045 (J)	–
RE39-09-3904	39-604654	0.5–1.0	Soil	–	–	–	–	–	–	–	–	0.0005 (J)	–
RE39-09-3905	39-604655	0.0–0.5	Soil	–	–	–	0.32	–	1 (J)	–	–	0.00045 (J)	–
RE39-09-3906	39-604655	0.5–1.0	Soil	–	–	–	–	–	–	–	–	0.00063 (J)	–
RE39-09-3907	39-604656	0.0–0.5	Sed	–	–	–	–	–	–	0.00036 (J)	–	0.00045 (J)	–
RE39-09-3908	39-604656	0.5–1.0	Sed	–	–	–	–	–	–	–	–	0.00046 (J)	–
RE39-09-3910	39-604657	0.5–1.0	Soil	–	–	–	–	0.00037 (J)	–	–	–	–	–
RE39-09-3911	39-604658	0.0–0.5	Soil	–	–	–	–	–	–	–	–	0.00041 (J)	–
RE39-09-3912	39-604658	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–
RE39-09-3913	39-604659	0.0–0.5	Sed	–	–	–	–	–	–	0.00037 (J)	–	0.00041 (J)	–
RE39-09-3915	39-604660	0.0–0.5	Soil	–	–	–	–	–	–	–	–	0.00047 (J)	–
RE39-09-3925	39-604665	0.0–0.5	Qbo	–	–	–	–	–	–	–	–	–	–
RE39-09-3926	39-604665	0.5–1.0	Qbo	0.36 (J-)	–	–	–	–	–	–	–	–	–
RE39-09-3928	39-604666	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–
RE39-09-3929	39-604667	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–
RE39-09-3930	39-604667	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–
RE39-09-3937	39-604671	0.0–0.5	Soil	–	–	–	–	NA	–	NA	NA	NA	–
RE39-09-3938	39-604671	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–
RE39-09-3939	39-604672	0.0–0.5	Soil	–	–	–	–	–	–	0.0012 (J)	–	–	–
RE39-09-3940	39-604672	0.5–1.0	Soil	–	–	–	–	–	–	–	–	0.00048 (J)	–
RE39-09-3941	39-604673	0.0–0.5	Sed	–	–	–	–	–	–	–	–	–	–
RE39-09-3942	39-604673	0.5–1.0	Sed	–	–	–	–	–	–	–	–	–	–
RE39-09-3943	39-604674	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–
RE39-09-3944	39-604674	0.5–1.0	Soil	–	–	–	–	–	NA	–	–	–	–
RE39-09-3947	39-604676	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–
RE39-09-3951	39-604678	0.0–0.5	Sed	–	–	–	–	–	–	0.00038 (J)	–	–	–
RE39-09-3953	39-604679	0.0–0.5	Soil	–	–	–	–	–	–	0.0016 (J)	–	0.00071 (J)	–
RE39-09-3954	39-604679	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–
RE39-09-3955	39-604680	0.0–0.5	Sed	–	–	–	–	–	–	0.00049 (J)	–	–	–

Table 5.17-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	PETN	Phenanthrene	Pyrene	RDX	Styrene	TATB	Toluene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]	Trinitrotoluene[2,4,6-]
RE39-09-3956	39-604680	0.5–1.0	Sed	–	–	–	–	–	–	0.0005 (J)	–	–	–
RE39-09-3959	39-604682	0.0–0.5	Soil	–	–	–	–	–	–	–	–	–	–
RE39-09-3960	39-604682	0.5–1.0	Soil	–	–	–	–	–	–	–	–	–	–

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] – = If analyzed, sample result is not detected.

[b] NA = Not analyzed.

Table 5.17-4
Summary of Radionuclides Detected or Detected above BVs/FVs in the Extended Drainages

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Sed Background Value				**0.9**	**0.068**	**0.093**	**2.59**	**0.2**	**2.29**
Soil Background Value[a]				**1.65**	**0.054**	**na**[b]	**2.59**	**0.2**	**2.29**
RE39-09-3663	39-604534	0.0–0.5	Sed	–[c]	–	0.374424	–	–	–
RE39-09-3664	39-604534	0.5–1.0	Sed	–	–	0.200091	–	–	–
RE39-09-3671	39-604538	0.0–0.5	Sed	–	–	–	–	0.243	–
RE39-09-3688	39-604540	0.5–1.0	Soil	–	–	–	–	–	–
RE39-09-3695	39-604550	0.0–0.5	Sed	–	–	–	–	–	2.88
RE39-09-3696	39-604550	0.5–1.0	Sed	–	–	–	–	–	3.02
RE39-09-3698	39-604551	0.5–1.0	Sed	–	–	–	–	–	2.7
RE39-09-3703	39-604554	0.0–0.5	Sed	–	–	–	–	–	2.88
RE39-09-3704	39-604554	0.5–1.0	Sed	–	–	–	–	–	4.51
RE39-09-3738	39-604571	0.0–0.5	Sed	–	–	–	–	–	6.22
RE39-09-3739	39-604571	0.5–1.0	Sed	–	–	–	3.04	0.254	12.7
RE39-09-3743	39-604574	0.0–0.5	Sed	–	–	–	–	–	2.71
RE39-09-3753	39-604579	0.0–0.5	Soil	–	–	–	–	–	2.47
RE39-09-3754	39-604579	0.5–1.0	Soil	–	–	–	–	–	–
RE39-09-3768	39-604586	0.5–1.0	Soil	–	–	–	–	–	–
RE39-09-3769	39-604587	0.0–0.5	Sed	–	–	–	–	–	4.45
RE39-09-3770	39-604587	0.5–1.0	Sed	–	–	–	3.63	0.455	21.6
RE39-09-3772	39-604588	0.0–0.5	Soil	–	–	–	–	–	2.7
RE39-09-3781	39-604588	0.5–1.0	Soil	–	–	–	–	–	–
RE39-09-3774	39-604589	0.5–1.0	Sed	–	–	–	–	–	2.7 (J-)

Table 5.17-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Sed Background Value				**0.9**	**0.068**	**0.093**	**2.59**	**0.2**	**2.29**
Soil Background Value[a]				**1.65**	**0.054**	**na**[b]	**2.59**	**0.2**	**2.29**
RE39-09-3775	39-604590	0.0–0.5	Soil	–	–	–	4.5	0.408	21.1
RE39-09-3776	39-604590	0.5–1.0	Soil	–	–	–	23.6 (J+)	2.71 (J+)	137 (J+)
RE39-09-3778	39-604591	0.5–1.0	Soil	–	–	–	–	–	–
RE39-09-3779	39-604592	0.0–0.5	Sed	–	–	–	–	–	3.19
RE39-09-3783	39-604594	0.0–0.5	Soil	–	–	–	–	–	3.83
RE39-09-3790	39-604597	0.5–1.0	Sed	NA	–	–	–	–	4.69
RE39-09-3792	39-604598	0.5–1.0	Soil	–	–	–	–	–	2.88
RE39-09-3817	39-604599	0.5–1.0	Soil	–	–	–	–	–	–
RE39-09-3796	39-604600	0.5–1.0	Soil	–	0.0301	–	–	–	3.22 (J)
RE39-09-3799	39-604602	0.0–0.5	Soil	–	–	–	–	–	3.77
RE39-09-3800	39-604602	0.5–1.0	Soil	–	–	–	–	–	5.9
RE39-09-3801	39-604603	0.0–0.5	Soil	–	–	–	3.25	0.261	15.4 (J)
RE39-09-3802	39-604603	0.5–1.0	Soil	–	–	–	–	–	6.45
RE39-09-3803	39-604604	0.0–0.5	Sed	–	–	–	4.47	0.319	12.6
RE39-09-3805	39-604605	0.0–0.5	Soil	–	–	–	–	–	3.15
RE39-09-3806	39-604605	0.5–1.0	Soil	–	–	–	–	–	5.01 (J)
RE39-09-3807	39-604606	0.0–0.5	Soil	–	–	–	37.6 (J+)	3.01 (J+)	144 (J+)
RE39-09-3808	39-604606	0.5–1.0	Soil	–	–	–	21.6 (J+)	1.89 (J+)	90.9 (J+)
RE39-09-3809	39-604607	0.0–0.5	Sed	–	–	–	3.5	0.286	11.1
RE39-09-3810	39-604607	0.5–1.0	Sed	–	–	–	–	–	5 (J)
RE39-09-3811	39-604608	0.0–0.5	Soil	–	–	–	4.72	0.437	20.8 (J)

Table 5.17-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Sed Background Value				**0.9**	**0.068**	**0.093**	**2.59**	**0.2**	**2.29**
Soil Background Value[a]				**1.65**	**0.054**	**na**[b]	**2.59**	**0.2**	**2.29**
RE39-09-3812	39-604608	0.5–1.0	Soil	–	–	–	7.29	0.759	32.1
RE39-09-3813	39-604609	0.0–0.5	Sed	–	–	–	–	–	3.52 (J)
RE39-09-3814	39-604609	0.5–1.0	Sed	–	–	–	–	–	2.88 (J)
RE39-09-3827	39-604616	0.0–0.5	Soil	–	–	–	5.26 (J)	0.43 (J)	21 (J)
RE39-09-3828	39-604616	0.5–1.0	Soil	–	–	–	–	–	6.33 (J)
RE39-09-3829	39-604617	0.0–0.5	Soil	–	–	–	–	–	4.72 (J)
RE39-09-3830	39-604617	0.5–1.0	Soil	–	–	–	–	0.363 (J)	8.09 (J)
RE39-09-3831	39-604618	0.0–0.5	Sed	–	–	–	–	0.204 (J)	12.4 (J)
RE39-09-3832	39-604618	0.5–1.0	Sed	–	–	–	–	0.205 (J)	5.51 (J)
RE39-09-3833	39-604619	0.0–0.5	Soil	–	–	–	12 (J)	0.624 (J)	20.9 (J)
RE39-09-3834	39-604619	0.5–1.0	Soil	–	–	–	3.64 (J)	0.392 (J)	12.4 (J)
RE39-09-3835	39-604620	0.0–0.5	Sed	–	–	–	–	NA	4.16 (J)
RE39-09-3836	39-604620	0.5–1.0	Sed	–	–	–	3 (J)	0.205 (J)	7.01 (J)
RE39-09-3837	39-604621	0.0–0.5	Soil	–	–	–	–	–	7.23 (J)
RE39-09-3838	39-604621	0.5–1.0	Soil	–	–	–	3.46 (J)	0.319 (J)	9.69 (J)
RE39-09-3839	39-604622	0.0–0.5	Soil	–	–	–	–	NA	2.99 (J)
RE39-09-3840	39-604622	0.5–1.0	Soil	–	–	–	–	–	2.72 (J)
RE39-09-3842	39-604623	0.5–1.0	Sed	–	–	–	–	–	9.48 (J)
RE39-09-3848	39-604626	0.5–1.0	Soil	–	–	–	–	–	2.82 (J)
RE39-09-3902	39-604653	0.5–1.0	Sed	–	–	–	–	–	2.99
RE39-09-3904	39-604654	0.5–1.0	Soil	–	–	–	–	–	6.36

Table 5.17-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Sed Background Value				**0.9**	**0.068**	**0.093**	**2.59**	**0.2**	**2.29**
Soil Background Value[a]				**1.65**	**0.054**	**na**[b]	**2.59**	**0.2**	**2.29**
RE39-09-3905	39-604655	0.0–0.5	Soil	–	–	–	9.05	0.91	55.2
RE39-09-3906	39-604655	0.5–1.0	Soil	–	–	0.65 (J+)	3.43	0.451	22.4
RE39-09-3909	39-604657	0.0–0.5	Soil	–	–	–	–	–	3.45
RE39-09-3910	39-604657	0.5–1.0	Soil	–	–	–	2.96	0.424	21.1
RE39-09-3929	39-604667	0.0–0.5	Soil	–	–	–	4.95	0.398	14.9
RE39-09-3930	39-604667	0.5–1.0	Soil	–	–	–	3.18	0.325	8.36
RE39-09-3938	39-604671	0.5–1.0	Soil	–	–	–	–	–	–
RE39-09-3940	39-604672	0.5–1.0	Soil	–	–	–	–	–	2.45
RE39-09-3941	39-604673	0.0–0.5	Sed	–	–	–	–	–	7.13
RE39-09-3943	39-604674	0.0–0.5	Soil	–	–	–	–	–	4.53
RE39-09-3944	39-604674	0.5–1.0	Soil	–	–	–	–	–	–
RE39-09-3948	39-604676	0.5–1.0	Soil	–	–	–	–	–	–
RE39-09-3960	39-604682	0.5–1.0	Soil	–	–	–	–	–	–

Source: BVs/FVs from LANL (1998, 059730).

Notes: Units are pCi/g. Data qualifiers are defined in Appendix A.

[a] Applies only to samples from 0 to 1 ft bgs.

[b] na = Not available.

[c] – = If analyzed, sample result is less than BV/FV. If no BV/FV is available, analyte was not detected.

Table 5.17-5
Summary of COPCs for the Extended Drainages

Soil	Qbo	Sediment
Inorganic COPCs		
Antimony	Antimony	Antimony
Beryllium	Arsenic	Cadmium
Cadmium	Copper	Copper
Chromium	Cyanide	Iron
Cobalt	Nitrate	Mercury
Copper		Nitrate
Cyanide		Perchlorate
Lead		Selenium
Mercury		Vanadium
Nickel		Zinc
Nitrate		
Perchlorate		
Zinc		
Organic COPCs		
Acenaphthene	Bis(2-ethylhexyl)phthalate	Acetone
Acetone	PETN	Aroclor-1242
Anthracene		Aroclor-1254
Aroclor-1242		Benzo(a)pyrene
Aroclor-1254		Benzo(b)fluoranthene
Aroclor-1260		Benzo(g,h,i)perylene
Benzo(a)anthracene		Bis(2-ethylhexyl)phthalate
Benzo(a)pyrene		Bromomethane
Benzo(b)fluoranthene		Butylbenzylphthalate
Benzo(g,h,i)perylene		Chloromethane
Benzo(k)fluoranthene		2,4-dinitrotoluene
Bis(2-ethylhexyl)phthalate		Fluoranthene
Butylbenzylphthalate		Iodomethane
Chloromethane		Isopropyltoluene[4-]
Chrysene		Methylene chloride
Di-n-butylphthalate		Nitrotoluene[4-]
Dibenz(a,h)anthracene		Pyrene
Dichlorobenzene[1,2-]		TATB
Dichlorobenzene[1,4-]		Toluene
Fluoranthene		Trichlorofluoromethane
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]		Trimethylbenzene[1,2,4-]
HMX		Trinitrotoluene[2,4,6-]
Indeno(1,2,3-cd)pyrene		

Table 5.17-5 (continued)

Soil	Qbo	Sediment
Iodomethane		
Isopropyltoluene[4-]		
Methylene chloride		
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]		
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]		
Phenanthrene		
Pyrene		
RDX		
Styrene		
TATB		
Toluene		
Trichlorofluoromethane		
Trimethylbenzene[1,2,4-]		
Radionuclide COPCs		
Cesium-137	None	Uranium-234
Plutonium-239/240		Uranium-235/236
Tritium		Uranium-238
Uranium-234		Tritium
Uranium-235/236		
Uranium-238		

Table 5.18-1
Summary of Samples Collected and Analyses Requested for SWMU 39-001(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	Pesticides/PCBs	SVOCs	VOCs	pH + Cyanide
0239-96-0403	39-01384	14.0–15.0	Fill	–[a]	–	–	X[b]	–	X	X	X	–	X	–	–	X	X	X	X
0239-96-0406	39-01385	11.0–12.0	Fill	–	–	–	X	–	X	–	X	X	X	–	–	X	X	X	X
0239-96-0409	39-01386	5.0–6.0	Fill	–	–	–	X	–	X	–	X	–	X	–	–	X	X	X	X
0239-96-0411	39-01386	12.0–13.0	Fill	–	–	–	X	–	X	–	X	–	X	–	–	X	X	X	X
0239-96-0414	39-01387	12.0–13.0	Fill	–	–	–	X	–	X	–	X	–	X	–	–	X	X	X	X
0239-96-0418	39-01388	11.0–12.0	Fill	–	–	–	X	–	X	–	X	–	X	–	–	X	X	X	X
0239-96-0421	39-01389	11.0–12.0	Fill	–	–	–	X	–	X	–	X	–	X	–	–	X	X	X	X
0239-96-0426	39-01390	11.0–12.0	Fill	–	–	–	X	–	X	–	X	X	X	–	–	X	X	X	X
RE39-09-1907	39-604345	5.0–5.5	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1908	39-604345	5.5–6.0	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1909	39-604346	9.0–9.5	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1910	39-604346	9.5–10.0	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1911	39-604347	6.4–6.9	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1912	39-604347	6.9–7.4	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1913	39-604348	5.2–5.7	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1914	39-604348	5.7–6.2	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1915	39-604349	7.9–8.4	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1916	39-604349	8.4–8.9	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1917	39-604350	5.5–5.9	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1918	39-604350	5.9–6.5	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1919	39-604351	3.0–5.0	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1921	39-604352	5.0–5.5	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1923	39-604353	5.0–5.5	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X

Table 5.18-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	Tritium	High Explosives	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Metals	PCBs	Perchlorate	Pesticides/PCBs	SVOCs	VOCs	pH + Cyanide
RE39-09-1925	39-604354	5.4–6.4	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1927	39-604355	4.85–6.8	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1928	39-604355	9.7–10.7	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1929	39-604356	2.35–3.5	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1945	39-604356	2.35–3.5	Soil	–	–	X	–	–	–	–	–	–	–	–	–	–	–	–	–
RE39-09-1930	39-604356	5.7–7.5	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1931	39-604357	1.0–3.0	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1933	39-604358	4.6–6.0	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1935	39-604359	7.0–7.5	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1936	39-604359	7.5–8.5	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1937	39-604360	7.0–7.5	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1938	39-604360	7.5–8.0	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1939	39-604361	5.3–7.0	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1941	39-604362	1.6–3.5	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1943	39-604363	3.4–4.8	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X
RE39-09-1944	39-604363	6.8–9.0	Soil	X	X	–	X	X	X	X	–	X	X	X	X	–	X	X	X

[a] – = Analysis not requested.

[b] X = Analysis was performed.

Table 5.18-2
Summary of Inorganic Chemicals above BVs at SWMU 39-001(a)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Cyanide (Total)	Mercury	Nitrate	Perchlorate	Silver	Uranium
Soil and Fill Background Value				**0.83**	**0.4**	**0.5**	**0.1**	**na**[a]	**na**	**1**	**1.82**
0239-96-0403	39-01384	14.0–15.0	Fill	6.1 (U)	1.7	0.53 (U)	–[b]	NA[c]	NA	–	2.25
0239-96-0406	39-01385	11.0–12.0	Fill	6.1 (U)	0.71 (U)	0.55 (U)	–	NA	NA	–	NA
0239-96-0409	39-01386	5.0–6.0	Fill	6.2 (U)	0.71 (U)	0.54 (U)	–	NA	NA	–	1.91
0239-96-0411	39-01386	12.0–13.0	Fill	6 (U)	0.7 (U)	0.54 (U)	–	NA	NA	–	–
0239-96-0414	39-01387	12.0–13.0	Fill	6.2 (U)	0.71 (U)	0.56 (U)	1.3	NA	NA	–	3.76
0239-96-0418	39-01388	11.0–12.0	Fill	9.4 (U)	0.59 (U)	0.54 (U)	–	NA	NA	1.9 (U)	–
0239-96-0421	39-01389	11.0–12.0	Fill	8.7 (U)	0.54 (U)	0.52 (U)	–	NA	NA	1.7 (U)	–
0239-96-0426	39-01390	11.0–12.0	Fill	10 (U)	0.62 (U)	0.58 (U)	–	NA	NA	2 (U)	NA
RE39-09-1907	39-604345	5.0–5.5	Soil	–	–	0.52 (UJ)	–	1.2	0.0026 (J)	–	NA
RE39-09-1908	39-604345	5.5–6.0	Soil	–	–	–	–	0.49	0.003 (J)	–	NA
RE39-09-1909	39-604346	9.0–9.5	Soil	–	–	0.52 (UJ)	–	0.76	0.0037 (J)	–	NA
RE39-09-1910	39-604346	9.5–10.0	Soil	–	–	0.52 (UJ)	–	0.62	0.0023 (J)	–	NA
RE39-09-1911	39-604347	6.4–6.9	Soil	–	–	0.52 (UJ)	–	1.8	0.0039 (J)	–	NA
RE39-09-1912	39-604347	6.9–7.4	Soil	–	–	0.53 (UJ)	–	1.7	–	–	NA
RE39-09-1913	39-604348	5.2–5.7	Soil	–	–	0.56 (UJ)	–	0.71	0.0045 (J)	–	NA
RE39-09-1914	39-604348	5.7–6.2	Soil	–	–	0.53 (U)	–	1.5	–	–	NA
RE39-09-1915	39-604349	7.9–8.4	Soil	–	–	0.52 (UJ)	–	14.1	–	–	NA
RE39-09-1916	39-604349	8.4–8.9	Soil	–	–	0.52 (UJ)	–	13	–	–	NA
RE39-09-1917	39-604350	5.5–5.9	Soil	–	–	0.53 (UJ)	–	0.55	–	–	NA
RE39-09-1918	39-604350	5.9–6.5	Soil	–	–	0.53 (UJ)	–	0.5	–	–	NA
RE39-09-1919	39-604351	3.0–5.0	Soil	–	–	0.55 (UJ)	–	0.18 (J)	–	–	NA

Table 5.18-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Cyanide (Total)	Mercury	Nitrate	Perchlorate	Silver	Uranium
Soil Background Value				**0.83**	**0.4**	**0.5**	**0.1**	**na**[a]	**na**	**1**	**1.82**
RE39-09-1921	39-604352	5.0–5.5	Soil	–	–	0.54 (UJ)	–	0.34	–	–	NA
RE39-09-1923	39-604353	5.0–5.5	Soil	–	–	0.53 (UJ)	–	0.86	–	–	NA
RE39-09-1925	39-604354	5.4–6.4	Soil	–	–	0.53 (UJ)	–	0.33	–	–	NA
RE39-09-1927	39-604355	4.85–6.8	Soil	–	–	–	–	1.6	–	–	NA
RE39-09-1928	39-604355	9.7–10.7	Soil	–	–	0.53 (UJ)	–	6.8	–	–	NA
RE39-09-1929	39-604356	2.35–3.5	Soil	–	–	–	–	0.58	–	–	NA
RE39-09-1930	39-604356	5.7–7.5	Soil	–	–	0.53 (UJ)	–	1.4	–	–	NA
RE39-09-1931	39-604357	1.0–3.0	Soil	–	–	–	–	0.7	–	–	NA
RE39-09-1933	39-604358	4.6–6.0	Soil	–	–	0.52 (U)	–	1.6	–	–	NA
RE39-09-1935	39-604359	7.0–7.5	Soil	–	–	0.54 (UJ)	–	2.7	–	–	NA
RE39-09-1936	39-604359	7.5–8.5	Soil	–	–	0.53 (UJ)	–	1.9	0.0049 (J)	–	NA
RE39-09-1937	39-604360	7.0–7.5	Soil	–	–	0.54 (UJ)	–	0.39	–	–	NA
RE39-09-1938	39-604360	7.5–8.0	Soil	–	–	–	–	0.57	–	–	NA
RE39-09-1939	39-604361	5.3–7.0	Soil	–	–	0.54 (UJ)	–	0.2 (J)	–	–	NA
RE39-09-1941	39-604362	1.6–3.5	Soil	–	–	0.62 (UJ)	0.377	0.38	–	–	NA
RE39-09-1943	39-604363	3.4–4.8	Soil	–	–	0.57 (UJ)	–	0.3	–	–	NA
RE39-09-1944	39-604363	6.8–9.0	Soil	–	–	0.55 (UJ)	–	0.28	–	–	NA

Source: BVs from LANL (1998, 059730).

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] na = Not available.

[b] –= If analyzed, sample result is less than the BV.

[c] NA = Not analyzed.

Table 5.18-3
Summary of Organic Chemicals Detected at SWMU 39-001(a)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1242	Aroclor-1254	Aroclor-1260	Benzo(g,h,i)perylene	Bis(2-ethylhexyl)phthalate	DDE[4,4'-]	DDT[4,4'-]	Di-n-butylphthalate	Di-n-octylphthalate	Dibenz(a,h)anthracene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
0239-96-0403	39-01384	14.0–15.0	Fill	–[a]	–	–	–	–	–	0.0053 (J-)	0.039 (J)	–	–	NA[b]	NA	NA
0239-96-0406	39-01385	11.0–12.0	Fill	–	–	–	–	–	–	–	0.063 (J)	–	–	NA	NA	NA
0239-96-0414	39-01387	12.0–13.0	Fill	–	0.79	–	–	–	0.312	–	–	–	–	NA	NA	NA
RE39-09-1908	39-604345	5.5–6.0	Soil	–	0.064 (J)	–	–	–	NA	NA	–	–	–	NA	NA	NA
RE39-09-1909	39-604346	9.0–9.5	Soil	–	0.0061 (J)	–	–	–	NA	NA	–	0.077 (J)	–	NA	NA	NA
RE39-09-1910	39-604346	9.5–10.0	Soil	–	0.014 (J)	–	–	–	NA	NA	–	–	–	NA	NA	NA
RE39-09-1911	39-604347	6.4–6.9	Soil	0.0089 (J)	–	–	–	–	NA	NA	–	–	–	NA	NA	NA
RE39-09-1912	39-604347	6.9–7.4	Soil	–	–	–	–	–	NA	NA	–	–	–	NA	NA	NA
RE39-09-1914	39-604348	5.7–6.2	Soil	–	0.026 (J)	–	–	–	NA	NA	–	–	–	NA	NA	NA
RE39-09-1915	39-604349	7.9–8.4	Soil	0.25 (J)	–	0.009 (J)	–	–	NA	NA	–	–	–	NA	NA	NA
RE39-09-1916	39-604349	8.4–8.9	Soil	0.52 (J)	–	0.016 (J)	0.041 (J)	–	NA	NA	–	0.35	0.037 (J)	NA	NA	NA
RE39-09-1917	39-604350	5.5–5.9	Soil	–	–	–	–	–	NA	NA	–	–	–	NA	NA	NA
RE39-09-1918	39-604350	5.9–6.5	Soil	0.014 (J)	–	–	–	–	NA	NA	–	–	–	NA	NA	NA
RE39-09-1919	39-604351	3.0–5.0	Soil	–	0.0092 (J)	–	–	–	NA	NA	–	–	–	NA	NA	NA
RE39-09-1921	39-604352	5.0–5.5	Soil	–	–	–	–	–	NA	NA	–	–	–	NA	NA	NA
RE39-09-1923	39-604353	5.0–5.5	Soil	–	–	–	–	–	NA	NA	–	–	–	NA	NA	NA
RE39-09-1925	39-604354	5.4–6.4	Soil	–	0.0089 (J)	–	–	–	NA	NA	–	–	–	NA	NA	NA
RE39-09-1927	39-604355	4.85–6.8	Soil	0.16 (J)	–	0.0063 (J)	–	–	NA	NA	–	–	–	NA	NA	NA
RE39-09-1928	39-604355	9.7–10.7	Soil	39 (J)	–	0.8 (J)	–	–	NA	NA	–	–	–	NA	NA	NA
RE39-09-1929	39-604356	2.35–3.5	Soil	0.027 (J)	–	–	–	–	NA	NA	–	–	–	NA	NA	NA
RE39-09-1945	39-604356	2.35–3.5	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00000089 (J)	1.54E-06	0.00000015 (J)
RE39-09-1930	39-604356	5.7–7.5	Soil	0.0051 (J)	–	–	–	–	NA	NA	–	–	–	NA	NA	NA
RE39-09-1936	39-604359	7.5–8.5	Soil	–	–	–	–	0.25 (J)	NA	NA	–	–	–	NA	NA	NA
RE39-09-1938	39-604360	7.5–8.0	Soil	–	–	–	–	–	NA	NA	–	–	–	NA	NA	NA
RE39-09-1939	39-604361	5.3–7.0	Soil	0.0048 (J)	–	–	–	–	NA	NA	–	–	–	NA	NA	NA
RE39-09-1941	39-604362	1.6–3.5	Soil	–	0.0077 (J)	–	–	0.076 (J)	NA	NA	–	–	–	NA	NA	NA
RE39-09-1943	39-604363	3.4–4.8	Soil	–	–	–	–	0.052 (J)	NA	NA	–	–	–	NA	NA	NA
RE39-09-1944	39-604363	6.8–9.0	Soil	–	–	–	–	0.068 (J)	NA	NA	–	–	–	NA	NA	NA

Table 5.18-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Heptachlorodibenzofurans (Total)	HMX	Indeno(1,2,3-cd)pyrene	Iodomethane	Methoxychlor[4,4'-]	Methylene Chloride	Nitroglycerin	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	RDX
0239-96-0403	39-01384	14.0–15.0	Fill	NA	–	–	–	0.023 (J-)	–	NA	NA	–
0239-96-0406	39-01385	11.0–12.0	Fill	NA	–	–	–	–	–	NA	NA	–
0239-96-0414	39-01387	12.0–13.0	Fill	NA	–	–	–	–	–	NA	NA	–
RE39-09-1908	39-604345	5.5–6.0	Soil	NA	–	–	–	NA	–	–	NA	–
RE39-09-1909	39-604346	9.0–9.5	Soil	NA	–	–	–	NA	0.012	–	NA	–
RE39-09-1910	39-604346	9.5–10.0	Soil	NA	–	–	–	NA	0.0093	–	NA	–
RE39-09-1911	39-604347	6.4–6.9	Soil	NA	–	–	–	NA	0.013	–	NA	–
RE39-09-1912	39-604347	6.9–7.4	Soil	NA	–	–	–	NA	0.011	–	NA	–
RE39-09-1914	39-604348	5.7–6.2	Soil	NA	–	–	0.0027 (J)	NA	–	–	NA	0.032 (J+)
RE39-09-1915	39-604349	7.9–8.4	Soil	NA	–	–	–	NA	–	–	NA	–
RE39-09-1916	39-604349	8.4–8.9	Soil	NA	–	0.037 (J)	–	NA	0.014	–	NA	–
RE39-09-1917	39-604350	5.5–5.9	Soil	NA	–	–	–	NA	0.014	–	NA	–
RE39-09-1918	39-604350	5.9–6.5	Soil	NA	–	–	–	NA	–	–	NA	–
RE39-09-1919	39-604351	3.0–5.0	Soil	NA	–	–	–	NA	0.014	–	NA	–
RE39-09-1921	39-604352	5.0–5.5	Soil	NA	–	–	–	NA	0.012	–	NA	–
RE39-09-1923	39-604353	5.0–5.5	Soil	NA	–	–	–	NA	0.013	–	NA	–
RE39-09-1925	39-604354	5.4–6.4	Soil	NA	–	–	–	NA	–	–	NA	–
RE39-09-1927	39-604355	4.85–6.8	Soil	NA	–	–	–	NA	–	–	NA	–
RE39-09-1928	39-604355	9.7–10.7	Soil	NA	–	–	–	NA	–	–	NA	–
RE39-09-1929	39-604356	2.35–3.5	Soil	NA	–	–	–	NA	–	–	NA	–
RE39-09-1945	39-604356	2.35–3.5	Soil	1.5E-07	NA	NA	NA	NA	NA	NA	0.00000636 (J)	NA
RE39-09-1930	39-604356	5.7–7.5	Soil	NA	0.044 (J)	–	–	NA	–	–	NA	–
RE39-09-1936	39-604359	7.5–8.5	Soil	NA	–	–	–	NA	–	–	NA	–
RE39-09-1938	39-604360	7.5–8.0	Soil	NA	–	–	–	NA	–	0.093 (J)	NA	–
RE39-09-1939	39-604361	5.3–7.0	Soil	NA	0.02 (J)	–	–	NA	–	–	NA	–
RE39-09-1941	39-604362	1.6–3.5	Soil	NA	–	–	–	NA	–	–	NA	–
RE39-09-1943	39-604363	3.4–4.8	Soil	NA	–	–	–	NA	–	–	NA	–
RE39-09-1944	39-604363	6.8–9.0	Soil	NA	–	–	–	NA	–	–	NA	–

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] – = If analyzed, sample result is not detected.

[b] NA = Not analyzed.

Table 5.18-4
Summary of Radionuclides Detected or Detected above BVs/FVs at SWMU 39-001(a)

Sample ID	Location ID	Depth (ft)	Media	Cesium-134	Europium-152	Tritium	Uranium-238
Soil and Fill Background Value[a]				**na**[b]	**na**	**na**	**2.29**
0239-96-0403	39-01384	14.0–15.0	Fill	NA[c]	0.395	NA	NA
RE39-09-1927	39-604355	4.8500–6.8	Soil	–[d]	–	1.15 (J+)	–
RE39-09-1938	39-604360	7.5–8.0	Soil	0.047	–	–	–
RE39-09-1941	39-604362	1.6–3.5	Soil	–	–	–	4.67

Source: BVs/FVs from LANL (1998, 059730).

Notes: Units are pCi/g. Data qualifiers are defined in Appendix A.

[a] Applies only to samples from 0 to 1 ft bgs.

[b] na = Not available.

[c] NA = Not analyzed.

[d] – = If analyzed, sample result is less than BV/FV. If no BV/FV is available, analyte was not detected.

Table 5.18-5
Summary of COPCs for SWMU 39-001(a)

Soil and Fill
Inorganic COPCs
Cadmium
Mercury
Uranium
Nitrate
Perchlorate
Organic COPCs
Aroclor-1242
Aroclor-1254
Aroclor-1260
Benzo(g,h,i)perylene
Bis(2-ethylhexyl)phthalate
DDE[4,4'-]
DDT[4,4'-]
Di-n-butylphthalate
Di-n-octylphthalate
Dibenz(a,h)anthracene
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
HMX
Indeno(1,2,3-cd)pyrene
Iodomethane
Methoxychlor[4,4'-]
Methylene Chloride
Nitroglycerin
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
RDX
Radionuclide COPCs
Cesium-134
Europium-152
Tritium
Uranium-238

Table 5.19-1
Summary of Samples Collected and Analyses Requested for SWMU 39-001(b)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-1980	39-604374	21.5–22.0	Soil	X[a]	X	–[b]	X	X	X	X	X	X	X	X	X	X	X
RE39-09-1981	39-604374	22.0–22.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-1982	39-604375	21.0–21.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-1983	39-604375	21.5–22.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-1984	39-604376	9.0–9.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-1985	39-604376	9.5–10.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-1986	39-604377	7.0–7.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-1987	39-604377	7.5–8.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-1988	39-604378	5.0–5.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-1989	39-604378	5.5–6.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-1990	39-604379	16.0–16.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-1991	39-604379	16.5–17.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-1992	39-604380	17.0–17.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-1993	39-604380	17.5–18.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-1994	39-604381	7.0–7.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-1995	39-604381	7.5–8.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-1996	39-604382	15.5–16.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-1997	39-604382	16.0–16.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-1998	39-604383	16.0–16.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X

Table 5.19-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-1999	39-604383	16.5–17.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2000	39-604384	16.0–16.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2001	39-604384	16.5–17.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2002	39-604385	16.0–16.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2003	39-604385	16.5–17.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2004	39-604386	16.0–16.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2005	39-604386	16.5–17.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2007	39-604387	5.0–7.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2006	39-604387	16.5–16.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2009	39-604388	5.0–7.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2008	39-604388	10.0–12.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2011	39-604389	5.0–7.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2010	39-604389	7.0–8.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2013	39-604390	5.0–7.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2012	39-604390	10.0–15.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2014	39-604391	11.0–12.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2017	39-604392	5.0–7.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2016	39-604392	10.0–15.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2018	39-604393	5.0–7.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2019	39-604393	10.0–12.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2020	39-604394	5.0–7.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2021	39-604394	10.0–12.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2022	39-604395	12.5–13.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2023	39-604395	13.0–14.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X

Table 5.19-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	Metals	PCBs	Perchlorate	SVOCs	VOCs	pH + Cyanide
RE39-09-2024	39-604396	16.0–16.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2025	39-604396	16.5–17.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2026	39-604397	16.0–16.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2027	39-604397	16.5–17.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2028	39-604398	16.0–16.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-9769	39-604398	16.0–16.5	Soil	–	–	X	–	–	–	–	–	–	–	–	–	–	
RE39-09-2029	39-604398	16.5–17.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2030	39-604399	16.0–16.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2031	39-604399	16.5–17.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2032	39-604400	5.0–7.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2034	39-604401	5.0–7.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2035	39-604401	10.0–15.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2036	39-604402	5.0–7.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2038	39-604403	5.0–7.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2039	39-604403	16.0–16.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2041	39-604404	16.0–16.5	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2040	39-604404	16.5–17.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2043	39-604405	5.0–7.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2042	39-604405	16.5–17.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X
RE39-09-2044	39-604406	10.0–15.0	Soil	X	X	–	X	X	X	X	X	X	X	X	X	X	X

[a] X = Analysis was performed.

[b] – = Analysis not requested.

Table 5.19-2
Summary of Inorganic Chemicals Detected above BVs at SWMU 39-001(b)

Sample ID	Location ID	Depth (ft)	Media	Cyanide (Total)	Lead	Mercury	Nitrate	Perchlorate	Vanadium	Zinc
Soil Background Value				**0.5**	**22.3**	**0.1**	**na**[a]	**na**	**39.6**	**48.8**
RE39-09-1980	39-604374	21.5–22.0	Soil	0.58 (UJ)	–[b]	–	1.7	–	–	–
RE39-09-1981	39-604374	22.0–22.5	Soil	–	–	–	2.1	–	–	–
RE39-09-1982	39-604375	21.0–21.5	Soil	–	–	–	0.52	–	–	–
RE39-09-1983	39-604375	21.5–22.0	Soil	0.53 (UJ)	–	–	0.19 (J)	–	–	–
RE39-09-1984	39-604376	9.0–9.5	Soil	–	–	–	0.52	–	–	–
RE39-09-1985	39-604376	9.5–10.0	Soil	0.56 (U)	–	–	0.47	–	–	–
RE39-09-1986	39-604377	7.0–7.5	Soil	0.55 (U)	–	–	0.46	–	–	–
RE39-09-1987	39-604377	7.5–8.0	Soil	0.53 (U)	–	–	0.4	–	–	–
RE39-09-1988	39-604378	5.0–5.5	Soil	–	–	3.94 (J-)	4.6	–	48	–
RE39-09-1989	39-604378	5.5–6.0	Soil	–	–	0.22 (J-)	6.3	–	–	–
RE39-09-1990	39-604379	16.0–16.5	Soil	0.54 (U)	–	–	2.5	–	–	–
RE39-09-1991	39-604379	16.5–17.0	Soil	0.56 (U)	–	–	0.79	–	–	–
RE39-09-1992	39-604380	17.0–17.5	Soil	0.55 (U)	–	–	2.4	–	–	–
RE39-09-1993	39-604380	17.5–18.0	Soil	0.58 (U)	–	–	3.3	–	–	–
RE39-09-1994	39-604381	7.0–7.5	Soil	0.55 (U)	–	–	0.68	–	–	–
RE39-09-1995	39-604381	7.5–8.0	Soil	0.54 (U)	23.7	–	1.2	–	–	–
RE39-09-1996	39-604382	15.5–16.0	Soil	0.6 (U)	–	–	3.5	–	–	76.8
RE39-09-1997	39-604382	16.0–16.5	Soil	0.56 (U)	–	–	2.1	–	–	–
RE39-09-1998	39-604383	16.0–16.5	Soil	0.54 (U)	–	–	1.6	–	–	–
RE39-09-1999	39-604383	16.5–17.0	Soil	0.56 (U)	–	–	1.9	–	–	–
RE39-09-2000	39-604384	16.0–16.5	Soil	0.54 (U)	–	–	0.73	–	–	–
RE39-09-2001	39-604384	16.5–17.0	Soil	0.53 (U)	–	–	0.61	–	–	–

Table 5.19-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cyanide (Total)	Lead	Mercury	Nitrate	Perchlorate	Vanadium	Zinc
Soil Background Value				**0.5**	**22.3**	**0.1**	**na**[a]	**na**	**39.6**	**48.8**
RE39-09-2002	39-604385	16.0–16.5	Soil	0.54 (U)	–	–	0.33	–	–	–
RE39-09-2003	39-604385	16.5–17.0	Soil	0.55 (U)	–	–	0.29	–	–	–
RE39-09-2004	39-604386	16.0–16.5	Soil	0.54 (U)	–	–	1.9	–	–	–
RE39-09-2005	39-604386	16.5–17.0	Soil	0.52 (U)	–	–	1.1	–	–	–
RE39-09-2007	39-604387	5.0–7.0	Soil	0.51 (U)	–	–	1.3	–	–	–
RE39-09-2006	39-604387	16.5–16.5	Soil	0.53 (U)	–	–	0.87	–	–	–
RE39-09-2009	39-604388	5.0–7.0	Soil	0.54 (U)	–	–	2.5	–	–	–
RE39-09-2008	39-604388	10.0–12.0	Soil	0.51 (U)	–	–	0.38	–	–	–
RE39-09-2011	39-604389	5.0–7.0	Soil	–	–	–	0.36	–	–	–
RE39-09-2010	39-604389	7.0–8.0	Soil	0.52 (U)	–	–	9	–	–	–
RE39-09-2013	39-604390	5.0–7.0	Soil	0.53 (U)	–	–	0.093 (J)	–	–	–
RE39-09-2012	39-604390	10.0–15.0	Soil	0.54 (U)	–	–	0.57	–	–	–
RE39-09-2014	39-604391	11.0–12.0	Soil	0.57 (U)	–	–	0.41	0.012	–	–
RE39-09-2017	39-604392	5.0–7.0	Soil	0.53 (UJ)	–	–	–	–	–	–
RE39-09-2016	39-604392	10.0–15.0	Soil	0.52 (UJ)	–	–	–	–	–	–
RE39-09-2018	39-604393	5.0–7.0	Soil	0.54 (UJ)	–	–	2.2	–	–	–
RE39-09-2019	39-604393	10.0–12.0	Soil	–	–	–	0.75	–	–	–
RE39-09-2020	39-604394	5.0–7.0	Soil	0.53 (UJ)	–	–	0.45	–	–	–
RE39-09-2021	39-604394	10.0–12.0	Soil	0.54 (UJ)	–	–	0.27	–	–	–
RE39-09-2022	39-604395	12.5–13.0	Soil	0.63 (UJ)	–	–	0.83	–	–	–
RE39-09-2023	39-604395	13.0–14.0	Soil	0.56 (UJ)	–	–	–	–	–	–
RE39-09-2024	39-604396	16.0–16.5	Soil	0.54 (UJ)	–	–	0.48	–	–	–
RE39-09-2025	39-604396	16.5–17.0	Soil	0.55 (UJ)	–	–	0.67	–	–	–

Table 5.19-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cyanide (Total)	Lead	Mercury	Nitrate	Perchlorate	Vanadium	Zinc
Soil Background Value				**0.5**	**22.3**	**0.1**	**na**[a]	**na**	**39.6**	**48.8**
RE39-09-2026	39-604397	16.0–16.5	Soil	0.55 (UJ)	–	–	0.79	–	–	–
RE39-09-2027	39-604397	16.5–17.0	Soil	0.54 (UJ)	–	–	0.77	–	–	–
RE39-09-2028	39-604398	16.0–16.5	Soil	0.54 (UJ)	–	–	1.5	–	–	–
RE39-09-2029	39-604398	16.5–17.0	Soil	0.54 (UJ)	–	–	11.5	–	–	–
RE39-09-2030	39-604399	16.0–16.5	Soil	0.51 (UJ)	–	–	0.62	–	–	–
RE39-09-2031	39-604399	16.5–17.0	Soil	0.52 (UJ)	–	–	1.1	–	–	–
RE39-09-2032	39-604400	5.0–7.0	Soil	0.57 (UJ)	–	–	0.16 (J)	–	–	–
RE39-09-2034	39-604401	5.0–7.0	Soil	0.58 (UJ)	–	–	2.6	–	–	–
RE39-09-2035	39-604401	10.0–15.0	Soil	0.53 (UJ)	–	–	0.58	–	–	–
RE39-09-2036	39-604402	5.0–7.0	Soil	0.51 (UJ)	–	–	–	–	–	–
RE39-09-2038	39-604403	5.0–7.0	Soil	0.51 (UJ)	–	–	0.44	–	–	–
RE39-09-2039	39-604403	16.0–16.5	Soil	0.55 (UJ)	–	–	–	–	–	–
RE39-09-2041	39-604404	16.0–16.5	Soil	0.56 (UJ)	–	–	1.3	–	–	–
RE39-09-2040	39-604404	16.5–17.0	Soil	0.55 (UJ)	–	–	0.99	–	–	–
RE39-09-2043	39-604405	5.0–7.0	Soil	0.53 (UJ)	–	–	–	–	–	–
RE39-09-2042	39-604405	16.5–17.0	Soil	0.53 (UJ)	–	–	0.63	–	–	–
RE39-09-2044	39-604406	10.0–15.0	Soil	0.59 (UJ)	–	–	2.2	–	–	–

Source: BVs from LANL (1998, 059730).

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] na = Not available.

[b] – = If analyzed, sample result is less than the BV.

Table 5.19-3
Summary of Organic Chemicals Detected at SWMU 39-001(b)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Aroclor-1254	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Chrysene	Fluoranthene	HMX	Indeno(1,2,3-cd)pyrene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Phenanthrene	Pyrene	RDX	Toluene	Trimethylbenzene[1,2,4-]
RE39-09-1980	39-604374	21.5–22.0	Soil	–[a]	–	–	–	–	–	–	–	–	–	–	–	NA[b]	–	–	0.018 (J)	–	–
RE39-09-1981	39-604374	22.0–22.5	Soil	–	–	–	–	–	–	–	–	–	–	–	–	NA	–	–	0.018 (J)	–	–
RE39-09-1982	39-604375	21.0–21.5	Soil	–	0.0062 (J)	–	–	–	–	–	–	–	–	0.024 (J)	–	NA	–	–	0.062 (J)	–	–
RE39-09-1984	39-604376	9.0–9.5	Soil	–	–	–	–	–	–	–	–	–	–	0.014 (J)	–	NA	–	–	–	–	–
RE39-09-1988	39-604378	5.0–5.5	Soil	–	0.046 (J)	0.079 (J)	0.083 (J)	0.066 (J)	–	0.067 (J)	–	0.088 (J)	0.2 (J)	–	–	NA	0.13 (J)	0.16 (J)	–	–	–
RE39-09-1989	39-604378	5.5–6.0	Soil	–	0.0089 (J)	0.072 (J)	0.075 (J)	0.053 (J)	0.06 (J)	0.06 (J)	–	0.085 (J)	0.19 (J)	–	0.052 (J)	NA	0.13 (J)	0.17 (J)	–	–	–
RE39-09-2002	39-604385	16.0–16.5	Soil	–	–	–	–	–	–	–	–	–	–	0.016 (J-)	–	NA	–	–	–	–	–
RE39-09-2007	39-604387	5.0–7.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	NA	–	–	–	0.00037 (J)	–
RE39-09-2012	39-604390	10.0–15.0	Soil	–	–	–	–	–	–	–	0.18 (J)	–	–	–	–	NA	–	–	–	–	–
RE39-09-2016	39-604392	10.0–15.0	Soil	–	–	–	–	–	–	–	0.13 (J)	–	–	–	–	NA	–	–	–	–	–
RE39-09-2018	39-604393	5.0–7.0	Soil	–	–	–	–	–	–	–	–	–	–	0.046 (J-)	–	NA	–	–	–	–	–
RE39-09-2020	39-604394	5.0–7.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	NA	–	–	0.025 (J-)	–	–
RE39-09-2022	39-604395	12.5–13.0	Soil	–	–	–	–	–	–	–	–	–	–	0.027 (J-)	–	NA	–	–	0.12 (J)	–	–
RE39-09-2023	39-604395	13.0–14.0	Soil	–	–	–	–	–	–	–	0.12 (J)	–	–	–	–	NA	–	–	0.06 (J)	–	–
RE39-09-2025	39-604396	16.5–17.0	Soil	–	–	–	–	–	–	–	0.12 (J)	–	–	–	–	NA	–	–	–	–	–
RE39-09-9769	39-604398	16.0–16.5	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.000000957 (J)	NA	NA	NA	NA	NA
RE39-09-2030	39-604399	16.0–16.5	Soil	–	–	–	–	–	–	–	0.18 (J)	–	–	–	–	NA	–	–	–	–	–
RE39-09-2031	39-604399	16.5–17.0	Soil	–	–	–	–	–	–	–	0.23 (J)	–	–	–	–	NA	–	–	–	–	–
RE39-09-2032	39-604400	5.0–7.0	Soil	–	–	–	–	–	–	–	0.079 (J)	–	–	–	–	NA	–	–	–	–	0.00052 (J)
RE39-09-2035	39-604401	10.0–15.0	Soil	–	–	–	–	–	–	–	0.069 (J)	–	–	–	–	NA	–	–	–	–	–
RE39-09-2036	39-604402	5.0–7.0	Soil	0.31 (J)	–	–	–	–	–	–	–	–	–	–	–	NA	–	–	–	–	–
RE39-09-2038	39-604403	5.0–7.0	Soil	–	–	–	–	–	–	–	–	–	–	–	–	NA	–	–	–	–	0.00048 (J)
RE39-09-2039	39-604403	16.0–16.5	Soil	–	–	–	–	–	–	–	0.13 (J)	–	–	–	–	NA	–	–	–	–	–
RE39-09-2041	39-604404	16.0–16.5	Soil	–	–	–	–	–	–	–	0.44	–	–	–	–	NA	–	–	–	–	–
RE39-09-2040	39-604404	16.5–17.0	Soil	–	–	–	–	–	–	–	0.13 (J)	–	–	–	–	NA	–	–	–	–	–
RE39-09-2043	39-604405	5.0–7.0	Soil	–	–	–	–	–	–	–	0.055 (J)	–	–	–	–	NA	–	–	–	–	–
RE39-09-2042	39-604405	16.5–17.0	Soil	–	–	–	–	–	–	–	0.055 (J)	–	–	–	–	NA	–	–	–	–	0.00071 (J)

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] – = If analyzed, sample result is not detected.

[b] NA = Not analyzed.

Table 5.19-4
Summary of Radionuclides Detected or
Detected above BVs/FVs at SWMU 39-001(b)

Sample ID	Location ID	Depth (ft)	Media	Tritium
Soil Background Value[a]				**na**[b]
RE39-09-1986	39-604377	7.0–7.5	Soil	1.84
RE39-09-1987	39-604377	7.5–8.0	Soil	0.67
RE39-09-1988	39-604378	5.0–5.5	Soil	2.18
RE39-09-2009	39-604388	5.0–7.0	Soil	0.99

Source: BVs/FVs from LANL (1998, 059730).
Notes: Units are pCi/g. Data qualifiers are defined in Appendix A.
[a] Applies only to samples from 0 to 1 ft bgs.
[b] na = Not available.

Table 5.19-5
Summary of COPCs for SWMU 39-001(b)

Soil
Inorganic COPCs
Cyanide
Lead
Mercury
Nitrate
Perchlorate
Vanadium
Zinc
Organic COPCs
Acenaphthene
Aroclor-1254
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
Bis(2-ethylhexyl)phthalate
Organic COPCs
Chrysene
Fluoranthene
HMX
Indeno(1,2,3-cd)pyrene
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
Phenanthrene
Pyrene
RDX
Toluene
Trimethylbenzene[1,2,4-]
Radionuclide COPCs
Tritium

Table 5.20-1
Summary of Samples Collected and Analyses Requested for SWMU 39-006(a) Inactive Components

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and Furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	TCLP for Metals	Metals	PCBs	Perchlorate	Pesticides/PCBs	SVOCs	VOCs	pH + Cyanide
0239-96-0485	39-01502	8.0–9.0	Fill	–[a]	–	–	X[b]	–	–	–	X	X	–	–	–	X	X	X	–
RE39-09-9770	39-604771	0.0–1.0	Soil	–	–	X	–	–	–	–	–	–	–	–	–	–	–		
RE39-09-5389	39-604868	9.5–10.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5390	39-604868	10.0–10.5	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5391	39-604869	4.5–10.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5392	39-604869	10.0–10.5	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5393	39-604870	9.5–10.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5394	39-604870	10.0–10.5	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5395	39-604871	9.5–10.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5396	39-604871	10.0–10.5	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5397	39-604872	9.5–10.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5398	39-604872	10.0–10.5	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5399	39-604873	9.5–10.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5400	39-604873	10.0–10.5	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5401	39-604874	9.5–10.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5402	39-604874	10.0–10.5	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5403	39-604875	9.5–10.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5404	39-604875	10.0–10.5	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5405	39-604876	9.5–10.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5406	39-604876	10.0–10.5	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5407	39-604877	9.5–10.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X

Table 5.20-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	TCLP for Metals	Metals	PCBs	Perchlorate	Pesticides/PCBs	SVOCs	VOCs	pH + Cyanide
RE39-09-5408	39-604877	10.0–10.5	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5409	39-604878	10.0–10.5	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5410	39-604878	10.5–11.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5411	39-604879	10.0–10.5	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5412	39-604879	10.5–11.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5413	39-604880	10.0–10.5	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5414	39-604880	10.5–11.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5415	39-604881	10.0–10.5	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5416	39-604881	10.5–11.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5417	39-604882	10.0–10.5	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5418	39-604882	10.5–11.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5419	39-604883	10.0–10.5	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5420	39-604883	10.5–11.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5421	39-604884	10.0–10.5	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5422	39-604884	10.5–11.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5423	39-604885	3.0–4.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5424	39-604885	6.0–7.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5425	39-604886	3.0–4.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5426	39-604886	6.0–7.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5427	39-604887	3.0–4.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5428	39-604887	6.0–7.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5429	39-604888	3.0–4.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5430	39-604888	6.0–9.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X

Table 5.20-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins and furans	Gamma Spectroscopy	High Explosives	Tritium	Isotopic Plutonium	Isotopic Uranium	TCLP for Metals	Metals	PCBs	Perchlorate	Pesticides/PCBs	SVOCs	VOCs	pH + Cyanide
RE39-09-5431	39-604889	3.0–4.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5432	39-604889	6.0–7.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5433	39-604890	5.0–7.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5434	39-604890	9.0–12.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5435	39-604891	3.0–5.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5436	39-604891	8.0–10.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5437	39-604892	2.0–4.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5438	39-604892	7.0–9.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5439	39-604893	1.0–3.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5440	39-604893	4.0–5.5	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5441	39-604894	1.0–2.0	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X
RE39-09-5442	39-604894	3.0–4.5	Soil	X	X	–	X	X	X	X	X	–	X	X	X	–	X	X	X

[a] – = Analysis not requested.

[b] X = Analysis was performed.

Table 5.20-2
Summary of Inorganic Chemicals above BVs at SWMU 39-006(a) Inactive Components

Sample ID	Location ID	Depth (ft)	Media	Cadmium	Chromium	Cyanide (Total)	Lead	Nitrate	Perchlorate	Silver	Zinc
Soil Background Value				**0.4**	**19.3**	**0.5**	**22.3**	**na**[a]	**na**	**1**	**48.8**
RE39-09-5389	39-604868	9.5–10.0	Soil	0.94 (J)	–[b]	7.5 (J-)	–	3	–	9.4 (J)	–
RE39-09-5390	39-604868	10.0–10.5	Soil	2.7	–	7.4 (J-)	–	8.6	–	23.4	–
RE39-09-5391	39-604869	9.5–10.0	Soil	1.8	–	–	–	2.5	–	23.1	–
RE39-09-5392	39-604869	10.0–10.5	Soil	1.7	–	1.4 (J-)	–	3.3	–	14.9	–
RE39-09-5393	39-604870	9.5–10.0	Soil	6.7	32.3 (J)	10.9 (J-)	24	10.2	–	227 (J)	66.2
RE39-09-5394	39-604870	10.0–10.5	Soil	4.2	–	8.6 (J-)	–	10.4	–	94.7 (J)	51.5
RE39-09-5395	39-604871	9.5–10.0	Soil	1.2	–	0.83 (J-)	–	5.2	–	10.4	–
RE39-09-5396	39-604871	10.0–10.5	Soil	1.3	–	1.7 (J-)	–	4.3	–	7.4	–
RE39-09-5397	39-604872	9.5–10.0	Soil	–	–	0.57 (UJ)	–	1.4	–	4.4	–
RE39-09-5398	39-604872	10.0–10.5	Soil	1.1	–	0.61 (UJ)	–	2.4	–	6.3	–
RE39-09-5399	39-604873	9.5–10.0	Soil	–	–	–	–	8.8	–	1.1	–
RE39-09-5400	39-604873	10.0–10.5	Soil	–	–	0.62 (UJ)	–	10.6	–	–	–
RE39-09-5401	39-604874	9.5–10.0	Soil	–	–	0.65 (J-)	–	8.4	–	–	–
RE39-09-5402	39-604874	10.0–10.5	Soil	–	–	0.58 (J-)	–	8.6	–	–	55.8
RE39-09-5403	39-604875	9.5–10.0	Soil	–	–	–	–	4.5	–	–	–
RE39-09-5404	39-604875	10.0–10.5	Soil	–	–	–	–	8.9	–	–	–
RE39-09-5405	39-604876	9.5–10.0	Soil	–	–	–	–	1.9	–	–	–
RE39-09-5406	39-604876	10.0–10.5	Soil	–	–	–	–	7.4	–	–	–
RE39-09-5407	39-604877	9.5–10.0	Soil	–	–	–	–	3	–	–	–
RE39-09-5408	39-604877	10.0–10.5	Soil	–	–	1.4 (J-)	–	4.6	–	–	–
RE39-09-5409	39-604878	10.0–10.5	Soil	–	–	0.83	–	16 (J)	–	–	–
RE39-09-5410	39-604878	10.5–11.0	Soil	–	–	–	–	16.2 (J)	–	–	–
RE39-09-5413	39-604880	10.0–10.5	Soil	–	–	1.38	–	5.73 (J)	–	–	–

Table 5.20-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cadmium	Chromium	Cyanide (Total)	Lead	Nitrate	Perchlorate	Silver	Zinc
Soil Background Value				**0.4**	**19.3**	**0.5**	**22.3**	**na**[a]	**na**	**1**	**48.8**
RE39-09-5414	39-604880	10.5–11.0	Soil	–	–	1	–	7.32 (J)	–	–	–
RE39-09-5415	39-604881	10.0–10.5	Soil	–	–	3.99	–	–	–	–	–
RE39-09-5420	39-604883	10.5–11.0	Soil	–	–	–	–	5.91 (J)	–	–	–
RE39-09-5423	39-604885	3.0–4.0	Soil	–	–	1.05	–	7.49 (J)	–	1.3	–
RE39-09-5424	39-604885	6.0–7.0	Soil	–	–	1.53	–	7.35 (J)	–	1.1	–
RE39-09-5425	39-604886	3.0–4.0	Soil	–	–	1.03	–	5.32 (J)	–	–	–
RE39-09-5426	39-604886	6.0–7.0	Soil	–	–	–	–	15.3 (J)	0.00124 (J)	–	–
RE39-09-5427	39-604887	3.0–4.0	Soil	–	–	–	–	–	0.000604 (J)	–	–
RE39-09-5428	39-604887	6.0–7.0	Soil	–	–	8.2 (J)	–	11.4	0.000757 (J)	10.2	–
RE39-09-5429	39-604888	3.0–4.0	Soil	–	–	1.19 (J)	–	56.4	–	–	–
RE39-09-5430	39-604888	6.0–9.0	Soil	–	–	2.82 (J)	–	10.9	–	2.1	–
RE39-09-5431	39-604889	3.0–4.0	Soil	–	–	–	–	68.2	0.00324	–	–
RE39-09-5432	39-604889	6.0–7.0	Soil	–	–	–	–	6.77	0.00106 (J)	–	–
RE39-09-5433	39-604890	5.0–7.0	Soil	–	–	–	–	8.2	0.0016 (J)	–	–
RE39-09-5435	39-604891	3.0–5.0	Soil	–	–	8.02 (J)	–	–	–	2.2	–
RE39-09-5436	39-604891	8.0–10.0	Soil	–	–	–	–	4.49	–	–	–
RE39-09-5438	39-604892	7.0–9.0	Soil	–	–	–	–	10.1	0.00095 (J)	–	–
RE39-09-5439	39-604893	1.0–3.0	Soil	–	–	0.614 (J)	–	7.97	0.000615 (J)	–	–
RE39-09-5441	39-604894	1.0–2.0	Soil	–	–	–	–	6.75	–	–	–
RE39-09-5442	39-604894	3.0–4.5	Soil	–	–	–	–	10.8	–	–	–

Source: BVs from LANL (1998, 059730).

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] na = Not available.

[b] – = If analyzed, sample result is less than the BV.

Table 5.20-3
Summary of Organic Chemicals Detected at SWMU 39-006(a) Inactive Components

Sample ID	Location ID	Depth (ft)	Media	Acetone	Aroclor-1254	Benzene	Bis(2-ethylhexyl)phthalate	Di-n-butylphthalate	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofurans (Total)
0239-96-0485	39-01502	8.0–9.0	Fill	–[a]	–	0.0088	–	–	NA[b]	NA	NA	NA	NA
RE39-09-9770	39-604771	0.0–1.0	Soil	NA	NA	NA	NA	NA	0.000009	1.62E-05	2.21E-06	1.72E-06	1.21E-06
RE39-09-5389	39-604868	9.5–10.0	Soil	–	–	–	2	–	NA	NA	NA	NA	NA
RE39-09-5391	39-604869	9.5–10.0	Soil	0.0099 (J)	–	–	–	–	NA	NA	NA	NA	NA
RE39-09-5392	39-604869	10.0–10.5	Soil	0.0092 (J)	–	–	–	–	NA	NA	NA	NA	NA
RE39-09-5393	39-604870	9.5–10.0	Soil	–	–	–	0.2 (J)	–	NA	NA	NA	NA	NA
RE39-09-5397	39-604872	9.5–10.0	Soil	–	0.028 (J)	–	–	–	NA	NA	NA	NA	NA
RE39-09-5399	39-604873	9.5–10.0	Soil	0.011 (J)	–	–	2	–	NA	NA	NA	NA	NA
RE39-09-5400	39-604873	10.0–10.5	Soil	0.013 (J)	0.0035 (J)	–	–	–	NA	NA	NA	NA	NA
RE39-09-5401	39-604874	9.5–10.0	Soil	–	–	–	–	–	NA	NA	NA	NA	NA
RE39-09-5403	39-604875	9.5–10.0	Soil	0.0088 (J)	0.014 (J)	–	–	–	NA	NA	NA	NA	NA
RE39-09-5407	39-604877	9.5–10.0	Soil	–	0.019 (J)	–	–	–	NA	NA	NA	NA	NA
RE39-09-5408	39-604877	10.0–10.5	Soil	–	0.01 (J)	–	–	–	NA	NA	NA	NA	NA
RE39-09-5409	39-604878	10.0–10.5	Soil	–	–	–	–	–	NA	NA	NA	NA	NA
RE39-09-5412	39-604879	10.5–11.0	Soil	–	–	–	–	–	NA	NA	NA	NA	NA
RE39-09-5413	39-604880	10.0–10.5	Soil	–	0.0039 (J)	–	–	–	NA	NA	NA	NA	NA
RE39-09-5414	39-604880	10.5–11.0	Soil	–	0.0035 (J)	–	–	–	NA	NA	NA	NA	NA

Table 5.20-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Aroclor-1254	Benzene	Bis(2-ethylhexyl)phthalate	Di-n-butylphthalate	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofurans (Total)
RE39-09-5415	39-604881	10.0–10.5	Soil	–	0.0096 (J)	–	–	–	NA	NA	NA	NA	NA
RE39-09-5419	39-604883	10.0–10.5	Soil	–	0.0028 (J)	–	–	–	NA	NA	NA	NA	NA
RE39-09-5423	39-604885	3.0–4.0	Soil	–	0.0042 (J)	–	–	–	NA	NA	NA	NA	NA
RE39-09-5424	39-604885	6.0–7.0	Soil	–	0.011 (J)	–	–	–	NA	NA	NA	NA	NA
RE39-09-5425	39-604886	3.0–4.0	Soil	–	0.0075 (J)	–	–	–	NA	NA	NA	NA	NA
RE39-09-5426	39-604886	6.0–7.0	Soil	–	0.0035 (J)	–	–	–	NA	NA	NA	NA	NA
RE39-09-5428	39-604887	6.0–7.0	Soil	–	0.072	–	0.12 (J)	0.039 (J)	NA	NA	NA	NA	NA
RE39-09-5429	39-604888	3.0–4.0	Soil	–	0.0066 (J)	–	0.19 (J)	–	NA	NA	NA	NA	NA
RE39-09-5430	39-604888	6.0–9.0	Soil	–	0.054	–	0.33 (J)	–	NA	NA	NA	NA	NA
RE39-09-5431	39-604889	3.0–4.0	Soil	–	–	–	0.54	–	NA	NA	NA	NA	NA
RE39-09-5432	39-604889	6.0–7.0	Soil	–	–	–	0.34 (J)	–	NA	NA	NA	NA	NA
RE39-09-5434	39-604890	9.0–12.0	Soil	–	–	–	0.19 (J)	–	NA	NA	NA	NA	NA
RE39-09-5435	39-604891	3.0–5.0	Soil	–	0.048	–	–	–	NA	NA	NA	NA	NA
RE39-09-5436	39-604891	8.0–10.0	Soil	–	–	–	0.21 (J)	–	NA	NA	NA	NA	NA
RE39-09-5437	39-604892	2.0–4.0	Soil	–	–	–	0.34 (J)	–	NA	NA	NA	NA	NA
RE39-09-5438	39-604892	7.0–9.0	Soil	–	–	–	0.19 (J)	–	NA	NA	NA	NA	NA
RE39-09-5439	39-604893	1.0–3.0	Soil	–	–	–	–	–	NA	NA	NA	NA	NA
RE39-09-5442	39-604894	3.0–4.5	Soil	–	–	–	0.39	–	NA	NA	NA	NA	NA

Table 5.20-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Iodomethane	Isopropyltoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Phenol	Tetrachlorodibenzofurans (Totals)	Toluene	Trimethylbenzene[1,2,4-]
0239-96-0485	39-01502	8.0–9.0	Fill	–	–	NA	NA	0.49	NA	–	–
RE39-09-9770	39-604771	0.0–1.0	Soil	NA	NA	0.000065 (J)	0.00000335 (J)	NA	2.02E-07	NA	NA
RE39-09-5389	39-604868	9.5–10.0	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5391	39-604869	9.5–10.0	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5392	39-604869	10.0–10.5	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5393	39-604870	9.5–10.0	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5397	39-604872	9.5–10.0	Soil	0.0009 (J)	–	NA	NA	–	NA	–	–
RE39-09-5399	39-604873	9.5–10.0	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5400	39-604873	10.0–10.5	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5401	39-604874	9.5–10.0	Soil	–	0.00059 (J)	NA	NA	–	NA	–	–
RE39-09-5403	39-604875	9.5–10.0	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5407	39-604877	9.5–10.0	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5408	39-604877	10.0–10.5	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5409	39-604878	10.0–10.5	Soil	–	–	NA	NA	–	NA	–	0.00042 (J)
RE39-09-5412	39-604879	10.5–11.0	Soil	–	–	NA	NA	–	NA	–	0.00044 (J)
RE39-09-5413	39-604880	10.0–10.5	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5414	39-604880	10.5–11.0	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5415	39-604881	10.0–10.5	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5419	39-604883	10.0–10.5	Soil	–	–	NA	NA	–	NA	–	0.00042 (J)
RE39-09-5423	39-604885	3.0–4.0	Soil	–	–	NA	NA	–	NA	–	–

Table 5.20-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Iodomethane	Isopropyltoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Phenol	Tetrachlorodibenzofurans (Totals)	Toluene	Trimethylbenzene[1,2,4-]
RE39-09-5424	39-604885	6.0–7.0	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5425	39-604886	3.0–4.0	Soil	–	–	NA	NA	–	NA	–	0.00046 (J)
RE39-09-5426	39-604886	6.0–7.0	Soil	–	–	NA	NA	–	NA	–	0.00056 (J)
RE39-09-5428	39-604887	6.0–7.0	Soil	–	–	NA	NA	–	NA	0.00048 (J)	–
RE39-09-5429	39-604888	3.0–4.0	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5430	39-604888	6.0–9.0	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5431	39-604889	3.0–4.0	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5432	39-604889	6.0–7.0	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5434	39-604890	9.0–12.0	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5435	39-604891	3.0–5.0	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5436	39-604891	8.0–10.0	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5437	39-604892	2.0–4.0	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5438	39-604892	7.0–9.0	Soil	–	–	NA	NA	–	NA	–	–
RE39-09-5439	39-604893	1.0–3.0	Soil	–	–	NA	NA	–	NA	0.00047 (J)	–
RE39-09-5442	39-604894	3.0–4.5	Soil	–	–	NA	NA	–	NA	–	–

Notes: Units are in mg/kg. Data qualifiers are defined in Appendix A.

[a] NA = Not analyzed.

[b] – = If analyzed, sample result is not detected.

Table 5.20-4
Summary of Radionuclides Detected or
Detected above BVs/FVs at SWMU 39-006(a) Inactive Components

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Tritium
Soil Background Value[a]				**1.65**	**na**[b]
RE39-09-5398	39-604872	10.0–10.5	Soil	–[c]	1.84
RE39-09-5401	39-604874	9.5–10.0	Soil	–	1.08
RE39-09-5402	39-604874	10.0–10.5	Soil	–	1.07
RE39-09-5407	39-604877	9.5–10.0	Soil	–	0.62
RE39-09-5419	39-604883	10.0–10.5	Soil	–	0.68
RE39-09-5439	39-604893	1.0–3.0	Soil	0.308	2.02

Source: BVs/FVs from LANL (1998, 059730).

Notes: Units are pCi/g. Data qualifiers are defined in Appendix A.

[a] Applies only to samples from 0 to 1 ft bgs.

[b] na = Not available.

[c] – = If analyzed, sample result is less than BV/FV. If no BV/FV is available, analyte was not detected.

Table 5.20-5
Summary of COPCs for
SWMU 39-006(a) Inactive Components

Soil and Fill
Inorganic COPCs
Cadmium
Chromium
Cyanide
Lead
Nitrate
Perchlorate
Silver
Zinc
Radionuclide COPCs
Cesium-137
Tritium
Organic COPCs
Acetone
Aroclor-1254
Benzene
Bis(2-ethylhexyl)phthalate
Di-n-butylphthalate
Iodomethane
Isopropyltoluene[4-]
Phenol
Toluene
Trimethylbenzene[1,2,4-]

Table 6.2-1
Summary of Investigation Results and Recommendations

SWMU/AOC	Brief Description	Extent Defined?	Potential Unacceptable Risk?	Recommendation
SWMU 39-002(a) Area 1	Storage area	No	Yes	Soil removal and additional sampling
SWMU 39-002 (a) Area 2	Storage area	No	n/a*	Investigation delayed until operations cease
SWMU 39-002(a) Area 3	Storage area	Yes	No	Corrective action complete recommendation delayed until completion of Areas 1 and 2
AOC 39-002(b)	Storage area	No	n/a	Sampling
AOC 39-002(c)	Storage area	Yes	No	Corrective action complete without controls
AOC 39-002(f)	Storage area	Yes	No	Corrective action complete without controls
SWMU 39-004(c)	Firing site	No	n/a	Delay further investigation until operations cease
SWMU 39-004(d)	Firing site	No	n/a	Delay further investigation until operations cease
SWMU 39-005	Former HE seepage pit	Yes	No	Corrective action complete without controls
SWMU 39-006(a) Active Components	Septic system	Yes	No	Delay further investigation until operations cease
SWMU 39-007(a)	Former storage area	Yes	Yes	Soil removal and additional sampling
AOC 39-007(d)	Storage area	Yes	No	Corrective action complete without controls
SWMU 39-008	Gas gun site	No	n/a	Delay further investigation until operations cease
SWMU 39-010	Excavated soil dump	No	No	Additional sampling to define extent
Extended drainages	Drainages below firing sites	n/a	No	None
SWMU 39-001(a)	Disposal area	No	n/a	Complete second phase of remediation
SMWU 39-001(b)	Disposal area	Yes	No	Corrective action complete with controls
SWMU 39-006(a) Inactive Components	Septic system	No	No	Additional sampling to define extent
AOC 30-002(d)	Storage area	n/a	n/a	Corrective action complete without controls
AOC 30-002(e)	Storage area	n/a	n/a	Corrective action complete without controls

*n/a = Not applicable.

Appendix A

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

A-1.0 ACRONYMS AND ABBREVIATIONS

%RSD	percent risk-specific dose
ACA	accelerated corrective action
AIRNET	air sampling network
AK	acceptable knowledge
ALARA	as low as reasonably achievable
amsl	above mean sea level
AOC	area of concern
ATSDR	Agency for Toxic Substances and Disease Registry
AUF	area use factor
BCG	Biota Concentration Guide
bgs	below ground surface
BV	background value
CCB	continuing calibration blank
CCV	continuing calibration verification
COPC	chemical of potential concern
COPEC	chemical of potential ecological concern
CSM	conceptual site model
CST	Chemical Sciences and Technology
D&D	decontamination and decommissioning
DAF	dilution attenuation factor
DDE	dichlorophenyltrichloroethylene
DDT	dichlorophenyltrichloroethylene
DER	duplicate ratio error
DL	detection limit
DNT	dinitrotoluene
DOE	Department of Energy (U.S.)
dpm	disintegrations per minute
DPSAA	Delta Prime Site Aggregate Area
DRO	diesel range organic
DU	depleted uranium
EDL	estimated quantitation limit
Eh	oxidation/reduction potential
ELISA	enzyme-linked immunosorbent assay

EP	Environmental Programs Directorate
EPA	Environmental Protection Agency (U.S.)
EPC	exposure point concentration
EQL	estimated quantitation limit
ER	Environmental Restoration (Project)
ES&H	Environmental Safety and Health (Laboratory division)
ESL	ecological screening level
FFCA	Federal Facility Compliance Act
FTB	field trip blank
FV	fallout value
GPR	ground-penetrating radar
GPS	global-positioning system
GRO	gasoline range organic
HE	high explosives
HI	hazard index
HIR	historical investigation report
HMX	octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
HpCDD	heptachlorodibenzo-p-dioxin
HpCDF	heptachlorodibenzofuran
HQ	hazard quotient
HR	home range
HSWA	Hazardous and Solid Waste Amendments
HxCDD	hexachlorodibenzo-p-dioxin
HxCDF	hexachlorodibenzofuran
ICB	initial calibration blank
ICS	interference check samples
ICV	initial calibration verification
IDL	instrument detection limit
IDW	investigation-derived waste
IS	internal standard
K_d	soil-water partition coefficient
K_{oc}	organic carbon-water partition coefficient
K_{ow}	octanol/water partition coefficient
LAL	lower acceptance limit

LANL	Los Alamos National Laboratory
LCS	laboratory control sample
LOAEL	lowest-observed-adverse-effect level
LRO	lubrication range organic
MCL	maximum contaminant level
MCPA	methyl chlorophenoxy acetic acid
MCPP	2-(2-methyl-4- chlorophenoxy) propionic
MDC	minimum detected concentration
MDL	method detection limit
MS	matrix spike
MSD	MS duplicate
MSGP	Multi-Sector General Permit
NFA	no further action
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NOAEL	no-observed-adverse-effect level
NPDES	National Pollutant Discharge Elimination System
OCDD	octachlorodibenzo-p-dioxin
OCDF	octachlorodibenzofuran
OD	open detonation
PAH	polycyclic aromatic hydrocarbon
PAUF	population area use factor
PCB	polychlorinated biphenyl
PCE	perchloroethylene (also tetrachloroethane)
PeCDD	pentachlorodibenzo-p-dioxin
PeCDF	pentachlorodibenzofuran
PETN	pentaerythritol tetranitrate
pH	potential of hydrogen
PID	photoionization detector
PPE	personal protective equipment
PRG	preliminary remediation goal
QA/QC	quality assurance/quality control
QP	quality procedure
RAGS	Risk Assessment Guidance for Superfund

RCRA	Resource Conservation and Recovery Act
RCT	radiological control technician
RDA	recommended daily allowance
RDX	hexahydro-1,3,5-trinitro-1,3,5-triazine
RER	relative error ratio
RfD	reference dose
RFI	RCRA facility investigation
RL	reporting limit
RPD	relative percent difference
RRF	relative response factor
SAA	satellite accumulation area
SAL	screening action level
SCL	sample collection log
SDI	Strategic Diagnostics, Inc.
SF	slope factor
SMO	Sample Management Office
SOP	standard operating procedure
SSL	soil screening level
SVOC	semivolatile organic compound
SWMU	solid waste management unit
SWPP	Stormwater Prevention Program
T&E	threatened and endangered
TA	technical area
TAL	target analyte list
TATB	triaminotrinitrobenzene
TCDD	tetrachlorodibenzo-p-dioxin
TEF	Toxic Equivalent Factors
TLD	thermoluminescent dosimeter
TNB	1,3,5-trinitrobenzene
TNT	2,4,6-trinitrotoluene
TPH	total petroleum hydrocarbons
TPU	total propagated uncertainty
TRV	toxicity reference value
TSCA	Toxic Substances Control Act

TSS	total suspended solids
UAL	upper acceptance limit
UCL	upper confidence limit
UMAP	Utilities and Infrastructure Map Service
USDA	U.S. Department of Agriculture
UTL	upper tolerance limit
VCA	voluntary corrective action
VCP	vitrified-clay pipe
VOC	volatile organic compound
WAC	waste acceptance criteria
WHO	World Health Organization
WCSF	waste characterization strategy form
WWTP	wastewater treatment plant
XRF	x-ray fluorescence

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

Data Review

B-1.0 OVERVIEW OF INVESTIGATIONS DATA

The data review summarizes the samples collected during implementation of the investigation work plan for North Ancho Canyon Aggregate Area (LANL 2007, 101894) at Los Alamos National Laboratory (the Laboratory). The sites investigated under this work plan consist of the following sites located at Technical Area 39 (TA-39): Solid Waste Management Units (SWMUs) 39-002(a) Area 1, 39-002(a) Area 2, 39-002(a) Area 3, 39-004(c), 39-004(d), 39-005, 39-006(a) active components, 39-006(a) inactive components, 39-007(a), 39-008, 39-010, 39-001(a), and 39-001(b); Areas of Concern (AOCs) 39-002(b), 39-002(c), 39-002(f), and 39-007(d); and the extended drainages that run through North Ancho Canyon between the SWMUs and AOCs.

This appendix provides a detailed review and assessment of the North Ancho Canyon Aggregate Area final data set. The data set is used to identify chemicals of potential concern (COPCs) and assess the nature and extent of contamination at each SWMU and AOC. The final data set and the identified COPCs are also evaluated in the human health and ecological risk screening assessments presented in Appendix H. The final data set includes analytical results from both historical sampling activities and the 2009 investigation. Only data determined to be of decision-level quality following the data-quality assessment (Appendix E) are included in the final data set. All investigation data are presented in Appendix F on DVD.

A principal objective of the data review and assessment is to evaluate the spatial distribution of COPCs and to determine if the nature and extent of COPCs are defined by the existing data. The extent of a COPC is defined if the data show decreasing concentrations or activities vertically and laterally from the source. Chemicals are frequently detected at or near the estimated quantitation limit (EQL) for organic chemicals and the estimated detection limit (DL) for inorganic chemicals. Concentrations at or near the EQL and estimated DL are considered “trace” concentrations. An organic or inorganic COPC concentration that decreases to trace levels is sufficient to demonstrate that the extent is defined.

Historical data are available for some of the sites in the North Ancho Canyon Aggregate Area. The historical data collected during the investigation are of varying quality, depending on the available documentation that accompanies the analytical results. In the Sample Management Database, all data records include a vintage code denoting how and where samples were submitted for analyses. In the early years of the Environmental Restoration Project, the samples were submitted to the Laboratory’s Chemical Science and Technology (CST) Division. They were either analyzed at a CST laboratory or shipped to one of several off-site contract laboratories. Samples analyzed at a CST laboratory are identified by the vintage code “CST On-Site.” Samples shipped by CST Division to off-site laboratories are identified by the vintage code “CST Off-Site.” From late 1995 until the present, samples have been shipped through the Sample Management Office (SMO) to off-site contract laboratories. These samples are identified by the vintage code “SMO.”

During revalidation of the entire data set, some of the historical results included in the approved North Ancho Canyon Aggregate Area investigation work plan (LANL 2007, 101894; NMED 2007, 098948) were determined to be of inadequate quality to use in determining nature and extent of contamination at these sites or for use in the risk-screening assessments. These data included all the CST on-site data as well as some of the CST off-site data. These screening level data are also not included in the data review, the evaluation of nature and extent, or the risk screening assessments. In some cases, individual analytical results were qualified as rejected (R) because of data quality issues. Rejected analytical results are not included in the data review, the evaluation of nature and extent, or the risk screening assessments. Data quality issues, including rejected analytical results, are discussed in Appendix E.

Historical data are included only for SWMUs 39-001(a), 39-002(a) Area 1, 39-004(c), 39-004(d), 39-006(a) inactive components, 39-007(a), and 39-008. The data was collected in 1995, 1996, and 2001. Analytical data representative of the SWMUs and AOCs include analytical results obtained from one or more samples collected during the following investigations/activities:

- 1994 RFI and the 1997 excavation of test pits at SWMU 39-001(a) (LANL 1997, 055633)
- 1995 sampling and 1997 VCA at SWMU 39-002(a) Area 1 (LANL 1995, 046190; LANL 1997, 056758)
- 1995 Phase I RFI at 39-004(c) and SWMU 39-004(d) (ICF Kaiser Engineers 1997, 097812; LANL 1997, 055633)
- 1993 RFI and 1996 sampling at SWMU 39-006(a) (ICF Kaiser Engineers 1995, 062968; LANL 1995, 046190)
- 1995 VCA and 2001 sampling for polychlorinated biphenyls (PCBs) at SWMU 39-007(a) (LANL 1996, 053786; LANL 2001, 071215)
- 1993 Phase I RFI at SWMU 39-008 (ICF Kaiser Engineers 1997, 097812)

B-2.0 COPC IDENTIFICATION

The COPC identification process includes comparison with media-specific background for inorganic chemical and radionuclide background values (BVs) or fallout values (FVs) provided in Laboratory guidance (LANL 1998, 059730). For inorganic chemicals, the site data are compared with a BV for the appropriate media type and identified as a COPC if at least one result or the analytical DL exceeds the BV. A FV for fallout radionuclides applies only to surface soil samples, generally from depths of 0–1 ft; the fallout radionuclides are tritium, cesium-137, americium-241, plutonium-238, plutonium-239, and strontium-90. Fallout radionuclides detected in site soil samples collected below 1 ft or detected in tuff were retained as COPCs. In some cases, background data and/or a BV or FV are unavailable; in these cases, the inorganic chemicals and radionuclides were evaluated according to detection status. Any organic chemical detected in site samples is designated as a COPC regardless of the media type.

Because the BV is an upper tolerance limit (UTL) and not an absolute upper bound on the background distribution, a small fraction of background observations are expected to exceed the BV. Therefore, the data set for inorganic chemicals exceeding BV and with greater than 50% detects in the sample data set was compared to the data set for background for the same analyte using the Gehan and quantile tests (Gehan 1965, 055611; Gilbert and Simpson 1990, 055612) provided in U.S. Environmental Protection Agency's (EPA's) ProUCL version 4.00.04 software (at http://www.epa.gov/esd/tsc/software.htm) (see Attachment B-1). Comparisons between data sets that might represent different concentration distributions, such as site-specific data and Laboratory background data, are performed using a variety of statistical methods. Background comparisons begin with a simple comparison of site-specific data with an UTL estimated from the background data (UTL [95, 95] or the 95% upper confidence bound on the 95th quantile). The UTLs are used to represent the upper end of concentration distribution and are also referred to as BVs (LANL 1998, 059730). The UTL 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 most commonly performed include the Gehan test (modification of the Wilcoxon Rank Sum test) and the quantile test (Gehan 1965, 055611; Gilbert and Simpson 1990, 055612). The Gehan test is recommended when nondetects are relatively frequent (greater than 10% and less than 50%). It handles data sets with

nondetects reported at multiple DLs in a statistically robust manner (Gehan 1965, 055611; Millard and Deverel 1988, 054953). The Gehan test is not recommended if either of the two data sets has more than 50% nondetects. If there are no nondetected concentrations in the data, the Gehan test is equivalent to the Wilcoxon Rank Sum test. The Gehan test is the preferred test because of its applicability to a majority of environmental data sets, and its recognition and recommendation in EPA-sponsored workshops and publications.

The quantile test is better suited to assessing shifts of a subset of the data. The quantile test determines whether more of the observations in the top 20% (chosen percentile) of the combined data set come from the site data set than would be expected by chance, given the relative sizes of the site and background data sets. If the relative proportion of the two populations being tested is different in the top 20% of the data than in the remainder of the data, the distributions may be partially shifted due to a subset of site data. This test is capable of detecting a statistical difference when only a small number of concentrations are elevated (Gilbert and Simpson 1992, 054952). The quantile test is the most useful distribution shift test where samples from a release represent a small fraction of the overall data collected. The quantile test is applied at a prespecified quantile or threshold, usually the 80th percentile. The test cannot be performed if more than 80% (or, in general, more than the chosen percentile) of the combined data are nondetected values. It can be used when the frequency of nondetects is approximately the same as the quantile being tested. For example, in a case with 75% nondetects in the combined background and site data set, application of a quantile test comparing 80th percentiles is appropriate. The threshold percentage can be adjusted to accommodate the detection rate of an analyte, or to look for differences further into the distribution tails. The quantile test is more powerful than the Gehan test for detecting differences when only a small percentage of the site concentrations are elevated.

If both tests indicated that concentrations of the inorganic chemical at the site were not significantly different from background, the analyte was dropped as a COPC. Figures of boxplots are provided for all the analytes that were excluded as COPCs based on statistical testing at each site. A boxplot 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, 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 are plotted as points overlying the boxplot.

Excavated samples are excluded from the COPC identification discussion because they are no longer representative of current site conditions. However, excavated sample results are provided on DVD in Appendix F.

Inorganic chemicals, organic chemicals, and radionuclides are identified as COPCs for an entire site if they are COPCs in any of the media sampled at the site. The media-specific identification of COPCs for each site is discussed in the following sections.

B-2.1 SWMU 39-002(a) Area 1

B-2.1.1 Inorganic Chemicals

Fifty-two soil samples were collected and analyzed for inorganic chemicals. Each of these samples was analyzed for target analyte list (TAL) metals. Thirty-eight samples were analyzed for anions (nitrates), cyanide, 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 detected above BVs and detected inorganic chemicals that have no BV. The sampling locations and detected concentrations are shown in Figure 5.3-2 of the investigation report.

- Cadmium, copper, lead, mercury, nickel, and zinc were reported with at least one detected result or DL above their respective BVs. Five of these inorganic chemicals (cadmium, copper, lead, mercury, and zinc) are retained as COPCs in soil because statistical tests indicated the concentrations were different from background. Results of the Gehan and quantile tests indicated that nickel concentrations at the site were not different from background; nickel is not retained as a COPC (Table B-2.1-1 and Figure B-2.1-1).
- Antimony, cyanide, silver, and thallium were reported with at least one detected result or DL above their respective BVs. The number of samples with detected results was too few for statistical analyses to be performed. Therefore, these inorganic chemicals are retained as COPCs in soil.
- Perchlorate was detected in at least one sample but has no BV. Perchlorate is retained as a COPC in soil. The number of samples with detected results was too few for statistical analyses to be performed. Therefore, perchlorate is retained as a COPC in soil.
- Nitrate was detected in some samples but has no BV. Since it was detected at concentrations expected to occur naturally, this inorganic chemical is not retained as a COPC in soil.

B-2.1.2 Organic Chemicals

Fifty-three soil samples were collected and analyzed for organic chemicals. Of these samples, 52 were analyzed for explosives compounds, polychlorinated biphenyls (PCBs) (and pesticides/PCBs), semivolatile organic compounds (SVOCs), and volatile organic compounds (VOCs). Fourteen samples were analyzed for total petroleum hydrocarbons (TPH) diesel-range organics (DRO). One sample was analyzed for dioxins and furans. Table 5.3-1 of the investigation report summarizes the samples collected and the requested analyses for each sample.

Forty-two organic chemicals were detected in at least one sample from soil. Table 5.3-3 presents the detected concentrations, and Plate 2 shows the sampling locations and detected concentrations.

- All 42 detected organic chemicals are retained as COPCs: acenaphthene; acenaphthylene; 4-amino-2,6-dinitrotoluene; 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; dibenzofuran; 1,2-dichlorobenzene; ethylbenzene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; indeno(1,2,3-cd)pyrene; iodomethane; methylene chloride; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; phenanthrene; pyrene; tetryl; toluene; TPH-DRO; trichloroethene; 1,2,4-trimethylbenzene; 2,4,6-trinitrotoluene; 1,2-xylene; and 1,3-xylene+1,4-xylene.

B-2.1.3 Radionuclides

Fifty-two soil samples were collected and analyzed for radionuclides. Each sample was analyzed for isotopic uranium. Gamma spectroscopy was performed on 38 samples, and 38 samples were analyzed for americium-241, isotopic plutonium, and tritium. Table 5.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.3-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and concentrations detected and detected above BV/FV are shown in Figure 5.3-3.

- Plutonium-239/240 was detected in at least one sample at a depth where the FV does not apply. Plutonium-239/240 is retained as a COPC in soil.
- Uranium-238 was detected above its BV in at least one sample. Uranium-238 is retained as a COPC in soil.
- Tritium was detected in at least one sample but has no soil BV. Tritium is retained as a COPC in soil.

B-2.1.4 Summary of COPCs

Table B-2.1-2 provides a summary of the COPCs at SWMU 39-002(a) Area 1 by media type.

B-2.1.5 Determination of Extent

Fifty-three soil samples from 24 sampling locations (Figure 5.3-1) were evaluated to determine the extent of contamination for Area 1. Fourteen historical samples and 39 newly collected samples were evaluated (data from 1 additional historical sample were not included because the data validation package was not available, so the data were not reportable). The new samples were collected from 13 locations. Except for location 39-604813, samples were collected from each of the new locations at three depths: 0–1, 1–2, and 23 ft below ground surface (bgs). At location 39-604813, the 2- to 3-ft-bgs sample could not be collected because of refusal. In addition, samples from two planned locations could were not collected because these locations were under a walkway. The sample analyzed for dioxins and furans was collected from location 39-604808 at 2–3 ft bgs.

B-2.1.5.1 Inorganic Chemicals

Ten inorganic COPCs were identified at SWMU 39-002(a) Area 1 (Table B-2.1-2).

- Antimony was detected above the BV and the maximum soil background concentration in one sample. The detected result (2.46 mg/kg) was at location 39-604812 at 0–1 ft bgs, and the concentration decreased with depth. Therefore, the extent of antimony is defined.
- Cadmium was detected above the BV in 15 samples at 11 locations. Ten of the locations were in the central portion of the sampling area. Cadmium was detected only at location 39-604813 in the southeastern portion of the sampling area. In each case, the detected result was below the maximum soil background concentration of 2.6 mg/kg. Where samples were obtained at multiple depths at these locations, concentrations decreased with depth. At location 39-604815, cadmium was detected at three depths, and the concentration increased slightly from 0.53 mg/kg at 0–1 ft bgs to 0.68 mg/kg at 1–2 ft bgs, then decreased to 0.62 mg/kg at 2–3 ft bgs. Therefore, the extent of cadmium is defined.

- Copper was detected above the BV and equal to or greater than the maximum soil background concentration in 23 samples at 17 locations. The concentrations ranged from 16 mg/kg to 508 mg/kg. Copper was detected in one location in the southeast portion of the sampling area; the other 16 locations were in the western and central portion. Copper was not detected in the northeastern portion of the sampling area. The samples with the highest concentrations were generally near buildings 39-2 and 39-62. Where samples were obtained at multiple depths (11 of the 17 locations), concentrations generally decreased with depth. At location 39-604815, copper was detected at three depths, and the concentration increased slightly with depth, from 41.3 mg/kg to 57.2 mg/kg. Therefore, lateral extent of copper is defined, but the vertical extent is not defined at location 39-604815.
- Cyanide was detected above the BV in four samples at two locations. At location 39-604812, cyanide was detected at 1 mg/kg at 0–1 ft bgs and was not detected above the BV at 1–2 and 2–3 ft bgs. At location 39-604814, cyanide was detected at 20.8 mg/kg at 0–1 and 1-2 ft bgs and at 4.85 mg/kg at 2–3 ft bgs. Therefore, the extent of cyanide is defined.
- Lead was detected above the BV in 24 samples and greater than the maximum soil background concentration in 17 of these 24 samples. The 24 samples were obtained from 17 locations, and the concentrations ranged from 22.6 mg/kg to 977 mg/kg. Lead was detected in 1 location in the southeast portion of the sampling area; the other 16 locations were in the western and central portion. Lead was not detected in the northeastern portion of the sampling area. The samples with the highest concentrations were generally near buildings 39-2 and 39-62. Where samples were obtained at multiple depths (10 of the 17 locations), concentrations generally decreased with depth. However, at location 39-604815, lead was detected at three depths, and the concentration increased slightly with depth, from 23.7 mg/kg to 39.8 mg/kg (about 1.1 to 1.8 times the BV). Therefore, lateral extent of lead is defined, but the vertical extent is not defined at location 39-604815.
- Mercury was detected above the BV in 25 samples. The concentrations ranged from 0.101 mg/kg to 2.5 mg/kg and occur at 17 locations throughout the sampling area. Mercury was detected in one location in the southeast portion of the sampling area; the other 16 locations were in the western and central portion. Mercury was not detected in the northeastern portion of the sampling area or at locations nearest building 39-62. The samples with the highest concentrations were generally near building 39-2 and in the central portion of the sampling area. Where samples were obtained at multiple depths (12 of the 17 locations), concentrations generally decreased with depth. At location 39-01496, the concentration at 0–0.5 ft bgs was 0.16 mg/kg and increased to 1.1 mg/kg at 1–1.5 ft bgs. At location 39-604813, the concentration increased slightly from 0.836 mg/kg to 0.846 mg/kg from 0–1 to 1–2 ft bgs. Therefore, the lateral extent of mercury is defined, but the vertical extent is not defined at locations 39-01496 and 39-604813.
- Perchlorate was detected in one sample at location 39-604814 at 1–2 ft bgs. Perchlorate was not detected at 0–1 or 2–3 ft bgs at that location. Therefore, the extent of perchlorate is defined.
- Silver was detected above the BV in one sample (location 39-01496). The detected concentration (1.1 mg/kg) was slightly above the BV of 1 mg/kg and decreased with depth. Therefore, the extent of silver is defined.
- Thallium was detected above the BV but below the maximum soil background concentration in one sample (location 39-01053). Thallium was detected above the BV and above the maximum soil background concentration in one sample (location 39-604812) at 0–1 ft bgs and not detected above the BV at that location at 1–2 and 2–3 ft bgs. Therefore, the extent of thallium is defined.

- Zinc was detected above the BV in 24 samples and greater than the maximum background concentration in 14 of these 24 samples. The concentrations in the 24 samples ranged from 49 mg/kg to 467 mg/kg at 17 locations. Zinc was detected in one location in the southeast portion of the sampling area; the other 16 locations were in the southwestern and central portion. Zinc was not detected in the northeastern or northwestern portion of the sampling area. The samples with the highest concentrations were generally near building 39-2 (with the highest concentration at location 39-604813) and in the central portion of the sampling area. Where samples were obtained at multiple depths (11 of the 17 locations), concentrations generally decreased with depth. At location 39-604813, the concentration increased from 297 mg/kg to 467 mg/kg from 0–1 to 1–2 ft bgs. Therefore, the lateral extent of zinc is defined, but the vertical extent is not defined at location 39-604813.

B-2.1.5.2 Organic Chemicals

Forty-two organic COPCs were identified at SWMU 39-002(a) Area 1 (Table 5.3-3). Concentrations at or near the EQL are considered trace concentrations. An organic COPC concentration that decreases to trace levels is sufficient to demonstrate that the extent is defined.

- Seven congeners were detected in the one sample analyzed for dioxins and furans at location 39-604808. Dioxin/furan congeners were detected at very low concentrations. The concentrations of the detected congeners are below the maximum concentrations of the same congeners detected at the Delta Prime Site Aggregate Area (DPSAA) (LANL 2008, 102760). Concentrations at DPSAA were reviewed by New Mexico Environment Department (NMED) and determined to not warrant additional sampling for dioxins/furans (Chamberlain 2006, 093679; Chamberlain 2006, 093678; Chamberlain 2006, 093677; Chamberlain 2006, 093680; Chamberlain 2006, 095870; Chamberlain 2006, 095867; LANL 2007, 099175; Roberts 2007, 097391; Roberts 2007, 098470; Roberts 2007, 099144). Therefore, the extent of dioxins and furans at the site does not need to be further defined.
- Two PCBs were identified as COPCs: Aroclor-1254 and Aroclor-1260. Aroclor-1254 was detected in 35 samples at 21 of the 24 locations throughout the sampling area, with concentrations ranging from 0.0023 mg/kg to 0.449 mg/kg. The highest concentration was at location 39-604812, near the northeast corner of building 39-2. Otherwise, the concentrations varied throughout the sampling area. The three locations at which Aroclor-1254 was not detected were at the northeast and southwest portions of the sampling area. Where samples were obtained at multiple depths (13 of the 21 locations), concentrations generally decreased with depth. At location 39-604815, Aroclor-1254 was detected at 0.15 mg/kg at 0–1 and 1–2 ft bgs, and increased slightly to 0.19 mg/kg at 2–3 ft bgs. Therefore, the lateral extent is defined for Aroclor-1254, but the vertical extent is not defined at location 39-604815. Aroclor-1260 was detected in 11 samples at five locations in the central portion of the sampling area and near building 39-2. The concentrations ranged from 0.0017 mg/kg to 0.155 mg/kg. Where samples were obtained at multiple depths, the concentration decreased with depth. Therefore, the extent of Aroclor-1260 is defined.
- Three explosives compounds were identified as COPCs: 4-amino-2,6-dinitrotoluene; tetryl; and 2,4,6-trinitrotoluene. Tetryl and 4-amino-2,6-dinitrotoluene were each detected in one sample at location 39-01053 below the EQL. Therefore, the extent of these chemicals is defined. The chemical 2,4,6-trinitrotoluene was also detected in one sample at location 39-01053 at 1.02 mg/kg at 0–0.5 ft bgs. Therefore, the extent of these three chemicals is defined.

- TPH-DRO was detected in 13 of the 14 samples for which TPH-DRO was analyzed at 12 locations in the west and central portion of the sampling area. The concentrations ranged from 9.1 mg/kg to 170 mg/kg, with the highest concentrations found near building 39-2. At the three locations where samples were obtained at multiple depths, the concentrations decreased with depth. Therefore, the extent of TPH-DRO is defined.
- Ethylbenzene, iodomethane, and 1,2,4-trimethylbenzene were each detected in only one sample at three locations. In each location, the concentration was below the EQLs. Iodomethane and 1,2,4-trimethylbenzene were not detected at depth. Therefore, the extent of these COPCs is defined.
- The COPCs 1,2-xylene and 1,3-xylene+1,4-xylene were each detected in only two samples at two locations. In each sample, the concentration was below the EQL. The concentrations decreased with depth. Therefore, the extent for 1,2-xylene and 1,3-xylene+1,4-xylene is defined.
- The COPCs 1,2-dichlorobenzene and trichloroethene were each detected in only three samples at concentrations below the EQLs. The 1,2-dichlorobenzene was not detected in the deepest sample at location 39-604805. At location 39-604809, 1,2-dichlorobenzene was detected at 0–1 ft bgs at 0.00043 mg/kg, not detected at 1–2 ft bgs, and then detected again at 2–3 ft bgs at 0.00043 mg/kg. Concentrations are well below the EQL. At the three locations in the central portion of the sampling area near buildings 39-2 and 39-62 where trichloroethene was detected, it was not detected in the deepest sample at each location. Therefore, the extent of these COPCs is defined.
- Acenaphthylene, bis(2-ethylhexyl)phthalate, dibenzofuran, and methylene chloride were each detected in several samples below the EQLs. Acenaphthylene was detected at five locations near building 39-2. Bis(2-ethylhexyl)phthalate was detected at seven locations in the central portion of the sampling area near buildings 39-2 and 39-62. Dibenzofuran was detected at eight locations generally near building 39-2 but also at location 39-604807 in the northeast portion of the sampling area and at location 39-604808 in the northwest portion. Methylene chloride was detected at five locations, three near building 39-2 and two in the central portion of the sampling area. At locations where samples were obtained at multiple depths, the concentrations generally decreased or remained the same with depth. Therefore, the extent of these COPCs is defined.
- Acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; di-n-butylphthalate; dibenz(a,h)anthracene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; and toluene were each detected in several samples in low concentrations above the EQLs at the 24 locations in the sampling area. The most prevalent chemicals were fluoranthene, phenanthrene, and pyrene (detected at all 24 locations); benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, and chrysene (detected at 23 locations); indeno(1,2,3-cd)pyrene (detected at 22 locations); and benzo(a)anthracene and benzo(k)fluoranthene (detected at 21 locations). Anthracene was detected at 18 locations in each portion of the sampling area. Acenaphthene was detected at 17 locations in each portion of the sampling area. Fluorene, naphthalene, and 2-methylnaphthalene were detected at 16, 13, and nine locations, respectively, mostly near building 39-2 and at locations 39-604807 and 39-604812 in the eastern part of the sampling area. Di-n-butylphthalate was detected at 12 locations mostly in the central portion of the sampling area near building 39-2 and at location 39-604813 in the southeast portion. Dibenz(a,h)anthracene was detected at four locations in the central portion of the sampling area near building 39-2. Toluene was detected at two locations in the central portion of the sampling area and at location 39-604813 in the southeast portion. At locations where

samples were collected at multiple depths, the concentrations decreased or remained the same with depth. Therefore, the extent of these COPCs is defined.

B-2.1.5.3 Radionuclides

Three radionuclide COPCs were identified at SWMU 39-002(a) Area 1 (Table B-2.1-2).

- Plutonium-239/240 was detected at a depth where the FV does not apply in one sample at location 39-604807. Plutonium-239/240 was not detected at 2–3 ft bgs at that location. Therefore, the extent of plutonium-239/240 is defined.
- Tritium was detected in one sample at 0–1 ft bgs at location 39-604812. Tritium was not detected at 1-2 and 2–3 ft bgs at that location. Therefore, the extent of tritium is defined.
- Uranium-238 was detected above the BV in four samples at three locations. Uranium-238 was detected at 3.88 pCi/g at 0–0.5 ft bgs at location 39-01053 and at 6.32 pCi/g at location 39-01499. Samples were not obtained at additional depths at these locations. At location 39-604812, uranium-238 was detected at 8.21 pCi/g at 0–1 ft bgs and decreased to 2.98 pCi/g at 2–3 ft bgs. Therefore, the extent of uranium-238 is defined.

B-2.1.5.4 Summary of Extent at SWMU 39-002(a) Area 1

The extent of the most of the inorganic, organic, and radionuclide COPCs is defined for SWMU 39-002(a) Area 1. However, extent is not defined for several chemicals at locations 39-01496, 39-604813, and 39-604815.

Location 39-604813 is near building 39-2, and the vertical extent is not defined for mercury and zinc. Locations 39-01496 and 39-604815 are located in the central portion of the sampling area, and the vertical extent is not defined for copper (location 39-604815), lead (location 39-604815), mercury (location 39-01496), and Aroclor-1254 (location 39-604815).

B-2.2 SWMU 39-002(a) Area 2

Because this SWMU is located inside an active office/laboratory building, investigation will be delayed until the building is renovated or demolished.

B-2.3 SWMU 39-002(a) Area 3

B-2.3.1 Inorganic Chemicals

Sixteen soil samples were collected at eight locations and analyzed for anions (nitrates), cyanide, perchlorate, and TAL metals. Table 5.5-1 summarizes samples collected and the requested analyses for each sample.

Table 5.5-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BV. The sampling locations and detected concentrations are shown in Figure 5.5-2 of the investigation report.

- Copper, lead, sodium, and zinc were reported with at least one detected result or DL above their respective BVs. Copper is retained as a COPC in soil because the statistical tests indicated that the concentrations at the site were different from background. Results of the Gehan and quantile

tests indicated that lead, sodium, and zinc concentrations at the site were not different from background; they have not been retained as COPCs in soil (Table B-2.3-1 and Figure B-2.3-1).

- Antimony and cyanide were reported with at least one detected result or DL above their respective BVs. The number of samples with detected results was too few for statistical analyses to be performed. Therefore, these inorganic chemicals are retained as COPCs in soil.
- Nitrate was detected in some samples but has no BV. Since it was detected at concentrations expected to occur naturally, this inorganic chemical is not retained as a COPC in soil.

B-2.3.2 Organic Chemicals

Seventeen soil samples were collected at eight locations and analyzed for organic chemicals. Of these samples, 16 were analyzed for explosives compounds, PCBs, SVOCs, and VOCs, and 1 sample was analyzed for dioxins and furans. Table 5.5-1 summarizes the samples collected and the requested analyses for each sample.

Twenty-nine organic chemicals were detected in at least one sample. Table 5.5-3 presents the detected concentrations and Figure 5.5-3 shows the sampling locations and detected concentrations.

- All 29 detected organic chemicals are retained as COPCs: 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; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; 2,3,4,6,7,8-hexachlorodibenzofuran; indeno(1,2,3-cd)pyrene; iodomethane; methylene chloride; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; PETN (pentaerythritol tetranitrate); phenanthrene; pyrene; and trichlorofluoromethane.

B-2.3.3 Radionuclides

Sixteen soil samples were collected at eight locations and analyzed for radionuclides. Gamma spectroscopy was performed on all of these samples. Each sample was also analyzed for americium-241, isotopic plutonium, isotopic uranium, and tritium. Table 5.5-1 summarizes the samples collected and the requested analyses for each sample. No radionuclides were detected or detected above the BVs/FVs in soil. Therefore, no radionuclides are retained as COPCs.

B-2.3.4 Summary of COPCs

Table B-2.3-2 provides a summary of the COPCs at SWMU 39-002(a) Area 3 by media type.

B-2.3.5 Determination of Extent for SWMU 39-002(a) Area 3

A total of 17 soil samples from eight sampling locations (Figure 5.5-1) were evaluated to determine whether a release has occurred at this site. Eleven samples were collected from beneath the asphalt by coring, and six samples were collected in the direction of drainage off the pad in the direction of the stream channel. Except for location 39-604737, samples were collected at two depths at each location: 0.5–1 and 1–2 ft bgs. At 39-604737, both samples were collected from 0.5–1 ft bgs. The sample analyzed for dioxins and furans was collected from location 39-604732 at 0.5–1 ft bgs.

B-2.3.5.1 Inorganic Chemicals

Three inorganic COPCs were identified at SWMU 39-002(a) Area 3 (Table 5.5-2).

- Copper had only one detected result above the BV at a single sampling location (39-604732). The concentration decreased with depth. Therefore, the extent for copper is defined.
- Antimony and cyanide were not detected above BV at the site.

B-2.3.5.2 Organic Chemicals

Twenty-nine organic COPCs were identified at SWMU 39-002(a) Area 3 (Table 5.5-3). Concentrations at or near the EQL are considered trace concentrations. An organic COPC concentration that decreases to trace levels is sufficient to demonstrate that the extent is defined.

- Nine congeners were detected in the one sample analyzed for dioxins and furans at location 39-604732. Dioxin/furan congeners were detected at very low concentrations. The concentrations of the detected congeners are below the maximum concentrations of the same congeners detected at DPSAA (LANL 2007, 099175). Concentrations at DPSAA were reviewed by NMED and determined to not warrant additional sampling for dioxins/furans (Chamberlain 2006, 093679; Chamberlain 2006, 093678; Chamberlain 2006, 093677; Chamberlain 2006, 093680; Chamberlain 2006, 095870; Chamberlain 2006, 095867; LANL 2007, 099175; Roberts 2007, 097391; Roberts 2007, 098470; Roberts 2007, 099144). Therefore, the extent of dioxins and furans at the site does not need to be further defined.
- Aroclor-1254 was detected below the EQL at 0.5–1 ft bgs at three of the five asphalt driveway locations (39-604732, 39-604733, and 39-604734). Aroclor-1254 and Aroclor-1260 were detected below the EQL at 0.5–1 ft bgs at one location away from the driveway in the direction of drainage (location 39-604738). The concentrations decreased with depth. Therefore, the extent of Aroclor-1254 and Aroclor-1260 is defined.
- The explosives compound PETN was detected below the EQL in one sample at 1–2 ft bgs at the asphalt driveway (location 39-604734) and was not detected at 0.5–1 ft bgs. Because the concentration essentially remained the same with depth, the extent of PETN is defined.
- Acetone, iodomethane, and trichlorofluoromethane were each detected below the EQL in only one sample. Acetone was detected at 1–2 ft bgs at location 39-604736 and was not detected at 0.5–1 ft bgs. Iodomethane was detected at 1-2 ft bgs at location 39-604732 and was detected at 0.5–1 ft bgs. Both of these locations are at the asphalt driveway. Trichlorofluroromethane was detected at 0–1 ft bgs at location 39-604737 and not detected at 0.5–1 ft bgs, which is away from the driveway in the direction of drainage. Concentrations essentially remained the same or decreased with depth. Therefore, the extent of these COPCs is defined.
- Anthracene, di-n-butylphthalate, and indeno(1,2,3-cd)pyrene were detected in two samples. Anthracene and indeno(1,2,3-cd)pyrene were detected below the EQL at 0.5–1 ft bgs at locations 39-604731 and 39-604735. Di-n-butylphthalate was detected below the EQL at 0.5–1 ft bgs at location 39-064733 and above the EQL at location 39-604735. All of these locations are at the asphalt driveway, and concentrations decreased with depth. Therefore, the extent of these COPCs is defined.
- Benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; methylene chloride;

phenanthrene; and pyrene were detected in six or more samples at both the asphalt driveway locations and the locations away from the driveway in the direction of drainage. The constituents were detected predominately at 0.5–1 ft bgs. Generally, the concentration for a COPC is higher or essentially the same at the driveway than away from the driveway. However, the concentration of bis(2-ethylhexyl)phthalate is higher in the samples away from the driveway in the direction of drainage. For COPCs detected at both depths at a single location, the concentration decreases with depth. However, bis(2-ethylhexyl)phthalate at location 39-604731 and methylene chloride at locations 39-604735, 39-604736, and 39-604738 were detected below the EQLs at 1–2 ft bgs but not at 0.5–1 ft bgs. Therefore, the extent of these COPCs is defined.

B-2.3.5.3 Radionuclides

No radionuclide COPCs were identified for SWMU 39-002(a) Area 3.

B-2.3.5.4 Summary of Extent at SWMU 39-002(a) Area 3

The extent of the inorganic and organic COPCs is defined for SWMU 39-002(a) Area 3.

B-2.4 AOC 39-002(b)

AOC 39-002(b) sampling locations were beneath a concrete pad, directly outside the door to building 39-006. No samples were taken at this location because sample collection with mechanical tools would disrupt operations at the adjacent active firing site. An attempt was made to punch through concrete to collect samples. The concrete pad was too substantial to allow for collect samples with hand tools.

B-2.5 AOC 39-002(c) Storage Area

B-2.5.1 Inorganic Chemicals in Soil

Ten soil samples were collected from at five locations and analyzed for anions, cyanide, nitrate, perchlorate, and TAL metals. Table 5.7-1 summarizes the samples collected and the requested analyses for each sample. Figure 5.7-1 shows the locations sampled.

Table 5.7-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 5.7-2.

- Antimony was reported in all samples with DLs above its BV and maximum background concentration. This inorganic chemical is retained as a COPC in soil.
- Cadmium and lead were reported with at least one detected result above their respective BVs. The results of the Gehan and quantile tests indicated lead concentrations at the site are not statistically different from background; lead is not retained as a COPC in soil (Table B-2.5-1 and Figure B-2.5-1). There were too few detected values for cadmium to perform statistical tests, and cadmium is retained as a COPC in soil.
- Copper was detected above its BV in one sample. The results of the Gehan and quantile tests indicated that copper concentrations at the site are statistically different from background; copper is retained as a COPC in soil.
- Cyanide and zinc were detected above their BVs in at least one sample. The results of the Gehan and quantile tests indicated that zinc concentrations at the site are statistically different from

background; cyanide could not be tested statistically. Cyanide and zinc are retained as COPCs in soil (Table B-2.5-1 and Figure B-2.5-1).

- Nitrate was detected in all samples but has no BV. Since it was detected at concentrations expected to occur naturally, this inorganic chemical is not retained as a COPC in soil.
- Mercury was detected above its BV once in a surface sample at location 39-604744. It is retained as a COPC for soil because the data set was insufficient for the quantile test.

B-2.5.2 Organic Chemicals in Soil

Ten soil samples were collected and analyzed for VOCs, SVOCs, and PCBs. Only one sample was analyzed for dioxins and furans. Table 5.7-1 summarizes the samples collected and the requested analyses for each sample.

Thirteen organic chemicals were detected in at least one sample from soil. Nine of the 13 organic chemicals were dioxins and furans. Table 5.7-3 presents the detected concentrations and Figure 5.7-3 shows the sampling locations and detected concentrations.

- Thirteen detected organic chemicals are retained as COPCs in soil: Aroclor-1254; benzo(a)anthracene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; toluene; and 1,3-xylene+1,4-xylene.

B-2.5.3 Summary of COPCs

Table B-2.5-2 provides a summary of the COPCs at AOC 39-002(c) in soil.

B-2.5.4 Determination of Extent for AOC 39-002(c)

B-2.5.4.1 Inorganic Chemicals

Six inorganic COPCs were identified at AOC 39-002(c) (Table 5.7-2). The inorganic chemicals detected or detected above BVs at SWMU 39-004(c) are shown in Figure 5.7-2. The extent of each COPC at AOC 39-002(c) is discussed below.

- Antimony was not detected above BV at this site.
- Cadmium was detected above its BV in one sample at location 39-604744 between 0.5 and 1 ft bgs. Since this metal was not detected in the deeper sample at the same location, the concentration decreased with depth. Therefore, lateral and vertical extent are defined for cadmium.
- Copper was detected above its BVs and maximum background concentration only in one sample at location 39-604744 between 0.5 and 1 ft bgs. Since this metal was not detected in the deeper sample at the same location, the concentration decreased with depth. Therefore, lateral and vertical extent are defined for copper.

- Cyanide was detected above its BV in one sample at location 39-604743 between 0.5 and 1 ft bgs. Since this metal was not detected in the deeper sample at the same location, the concentration decreased with depth. Therefore, lateral and vertical extent are defined for cyanide.
- Mercury was detected above its BV once in a surface sample at location 39-604744. It was not detected above its BV in the deeper sample at that location or at other locations. Therefore, lateral and vertical extent are defined for mercury.
- Zinc was detected above its BV in three samples from two locations. Two of the three detected samples were collected from 0.5 to 1 ft bgs and 1 to 2 ft bgs at location 39-604744. The concentrations of zinc decreased with depth. Therefore, lateral and vertical extent are defined for zinc.

B-2.5.4.2 Organic Chemicals

Thirteen organic COPCs were identified at AOC 39-002(c) (Table 5.7-3). The organic chemicals detected at AOC 39-002(c) are shown in Figure 5.7-3. The extent of each COPC at AOC 39-002(c) are discussed below.

- Only one sample was analyzed for dioxins and furans. Dioxin/furan congeners were detected at very low concentrations. The concentrations of the detected congeners are below the maximum concentrations of the same congeners detected at DPSAA (LANL 2007, 099175). Concentrations at DPSAA were reviewed by NMED and determined to not warrant additional sampling for dioxins/furans (Chamberlain 2006, 093679; Chamberlain 2006, 093678; Chamberlain 2006, 093677; Chamberlain 2006, 093680; Chamberlain 2006, 095870; Chamberlain 2006, 095867; LANL 2007, 099175; Roberts 2007, 097391; Roberts 2007, 098470; Roberts 2007, 099144). Therefore, the extent of dioxins and furans at the site does not need to be further defined.
- Benzo(a)anthracene and 1,3-xylene+1,4-xylene were detected below the respective EQLs in one sample (at location 39-604746) collected from 0.5 to 1 ft bgs. Since these organics were not detected in the deeper sample at the same location, the concentrations decreased with depth. Therefore, lateral and vertical extent of these COPCs are defined.
- Aroclor-1254 was detected in two samples below the EQL. One of the two detections was in the 0.5- to 1.0-ft-bgs depth at location 39-604743, but Aroclor-1254 was not detected in the deeper sample at the same location. The second detection was in a sample collected from 1 to 2 ft bgs at location 39-604746. While the two detected concentrations were below the EQL, the concentration at location 39-604746 was much lower than the EQL. Therefore, lateral and vertical extent are defined for Aroclor-1254.
- Toluene was detected in six soil samples. Five of the six detections were below the EQL. The concentrations were similar at different sampling locations with the same depth, while the concentrations decreased with depth at the same sampling location. Therefore, lateral and vertical extent are defined for toluene.

B-2.5.4.3 Summary of Extent at AOC 39-002(c)

The lateral and vertical extent of all inorganic and organic COPCs is defined for AOC 39-002(c).

B-2.6 AOC 39-002(f) Storage Area

B-2.6.1 Inorganic Chemicals in Soil

Ten soil samples were collected and analyzed for anions (nitrate), cyanide, perchlorate, and TAL metals. Table 5.8-1 summarizes samples collected and the requested analyses for each sample.

Table 5.8-2 lists the inorganic chemicals above the BVs and detected inorganic chemicals that have no BV. The sampling locations and detected concentrations are shown in Figure 5.8-2.

- Cadmium was not detected but had DLs above the BV. It is not retained as a COPC in soil because the DLs are less than the maximum background concentration.
- Antimony and copper were reported with one detected result for antimony and copper and the antimony DL above their respective BVs. There were too few detected values to perform statistical tests. These inorganic chemicals are retained as COPCs in soil.
- Nitrate was detected in at least one sample but has no BV. Concentrations are within the range of what is expected to occur naturally. It is not retained as a COPC in soil.
- Perchlorate was detected in at least one sample but has no BV. This inorganic chemical is retained as COPCs in soil.

B-2.6.2 Organic Chemicals in Soil

Ten soil samples were collected and analyzed for organic chemicals. Of these samples, one was analyzed for dioxin/furans. All samples were analyzed for PCBs, VOCs, and SVOCs. Table 5.8-1 summarizes the samples collected and the requested analyses.

- Twelve organic chemicals were detected in at least one sample from soil. Table 5.8-3 presents the detected concentrations, and Figure 5.8-3 shows the sampling locations and the detected concentrations.
- All 12 organic chemicals are retained as COPCs in soil: benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorobenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; phenanthrene; pyrene; and toluene.

B-2.6.3 Radionuclides in Soil

No samples from AOC 39-002(f) were analyzed for radionuclides.

B-2.6.4 Summary of COPCs at AOC 39-002(f)

Table B-2.6-1 provides a summary of the COPCs at AOC 39-002(f) by media type.

B-2.6.5 Determination of Extent at AOC 39-002(f) Storage Area

B-2.6.5.1 Inorganic Chemicals

Three inorganic COPCs were identified at AOC 39-002(f) (Table B-2.6-1).

- Antimony was detected in only one sample at the site. The antimony concentration decreased with depth. Therefore, lateral and vertical extent are defined for antimony.
- Copper was detected in only one sample and its concentration decreased with depth. Therefore, lateral and vertical extent are defined for copper.
- Perchlorate was detected across the site. Perchlorate concentrations decrease or remain essentially the same with depth. Lateral and vertical extent are defined for perchlorate.

B-2.6.5.2 Organic Chemicals

Twelve organic COPCs were detected at AOC 39-002(f) (Table B-2.6-1).

- Benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; and pyrene were detected in one sample at location 39-604514. The detections are at concentrations below the estimated quantitation limits (EQLs).
- Toluene was detected in two samples at location 39-60416. The detections are at concentrations around the EQL and decreased with depth. Therefore, lateral and vertical extent are defined for toluene.
- Three dioxin/furan congeners were detected at very low concentrations in one sample. The concentrations of the detected congeners are below the maximum concentrations of the same congeners detected at DPSAA (LANL 2007, 099175). Concentrations at DPSAA were reviewed by NMED and determined to not warrant additional sampling for dioxins/furans (Chamberlain 2006, 093679; Chamberlain 2006, 093678; Chamberlain 2006, 093677; Chamberlain 2006, 093680; Chamberlain 2006, 095870; Chamberlain 2006, 095867; LANL 2007, 099175; Roberts 2007, 097391; Roberts 2007, 098470; Roberts 2007, 099144). Therefore, the nature and extent of dioxins and furans at the site do not need to be further defined.

Therefore, lateral and vertical extent are defined for these COPCs.

B-2.6.5.3 Summary of Extent at AOC 39-002(f)

The lateral and vertical extent of the inorganic and organic COPCs are defined for AOC 39-002(f).

B-2.7 SWMU 39-004(c) Firing Site

B-2.7.1 Results of Inorganic Chemicals in Samples Collected from SWMU 39-004(c)

B-2.7.1.1 Inorganic Chemicals in Soil

During the 1995 and 2009 sampling events, 44 samples were collected from soil at 27 locations and analyzed for cyanide and TAL metals. Uranium was only analyzed in 41 samples collected in 1995. Anions and perchlorate were analyzed in three soil samples collected during the 2009 sampling event.

Table 5.9-1 summarizes the samples collected and the requested analyses for each sample. Figure 5.9-1 shows the locations sampled.

Table 5.9-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BV. The sampling locations and detected concentrations are shown in Figure 5.9-2.

- Antimony was reported in at least one sample with DLs above its BV and maximum background concentration. This inorganic chemical is retained as a COPC in soil.
- Barium, beryllium, and calcium were detected above their respective BVs in one sample but are not retained as COPCs in soil because the results of the Gehan and quantile tests indicated that they are not statistically different from background (Table B-2.7-1 and Figure B-2.7-1).
- Cadmium was detected above its BV in two samples and had DLs above its BV in most samples. Cadmium is retained as a COPC in soil because the data set was insufficient for the quantile test.
- Copper, cyanide, mercury, silver, thallium, uranium, and zinc were detected above their respective BVs in at least one sample. These inorganic chemicals are retained as COPCs in soil because the results of the Gehan and quantile tests indicated the concentrations of copper, uranium, and zinc at the site are statistically different from background (Table B-2.7-1 and Figure B-2.7-1). Cyanide, mercury, silver, and thallium were retained because they could not be statistically tested.
- Chromium, cobalt, lead, and nickel were detected above their respective BVs in at least one sample. The results of the Gehan and quantile tests indicated that the concentrations of chromium, cobalt, lead, and nickel at the site are not statistically different from background; they are not retained as COPCs in soil (Table B-2.7-1 and Figure B-2.7-1).
- Nitrate was detected in three samples but has no BV. Since it was detected at concentrations expected to occur naturally, this inorganic chemical is not retained as a COPC in soil.

B-2.7.1.2 Inorganic Chemicals in Sediment

One sample was collected from sediment during the 2009 sampling event and analyzed for anions, cyanide, nitrate, perchlorate, and TAL metals. Table 5.9-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.9-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BV. The sampling locations and detected concentrations are shown in Figure 5.9-2.

- Nitrate was detected in the sample but has no BV. Since it was detected at concentrations expected to occur naturally, this inorganic chemical is not retained as a COPC in soil.
- Selenium was reported with a DL above its BV. This inorganic chemical is retained as a COPC in sediment.

B-2.7.2 Results of Organic Chemicals in Samples Collected from SWMU 39-004(c)

B-2.7.2.1 Organic Chemicals in Soil

Forty-four soil samples were collected and analyzed for organic chemicals. Of these samples, two were analyzed for VOCs, 44 for SVOCs, 32 for explosives compounds, 3 for PCBs, and 1 for dioxins and furans. Table 5.9-1 summarizes the samples collected and the requested analyses for each sample.

Seventeen organic chemicals were detected in at least one sample. Seven of the 17 organic chemicals were dioxins and furans. Table 5.9-3 presents the detected concentrations, and Figure 5.9-3 shows the sampling locations and detected concentrations.

- Seventeen detected organic chemicals are retained as COPCs in soil: Aroclor-1248; Aroclor-1254; Aroclor-1260; benzoic acid; bis(2-chloroethyl)ether; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; di-n-butylphthalate; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; and RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine).

B-2.7.2.1 Organic Chemicals in Sediment

No organic chemicals were detected in sediment, and there are no organic COPCs in sediment.

B-2.7.3 Results of Radionuclides in Samples Collected from SWMU 39-004(c)

B-2.7.3.1 Radionuclides in Soil

Forty-four soil samples were collected and analyzed for radionuclides. Of these samples, 41 were analyzed for isotopic thorium, 30 by gamma spectroscopy, and 3 for americium-241, tritium, isotopic plutonium, and isotopic uranium. Table 5.9-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.9-4 presents the radionuclides detected above BVs/FVs. The sampling locations and concentrations are shown in Figure 5.9.4.

- Cesium-137 was detected below the FV. Cesium-137 is not retained as a COPC in soil.
- Plutonium-238 and plutonium-239/340 were detected in one sample at a depth where the FVs do not apply. These radionuclides are retained as COPCs in soil.
- Sodium-22 was detected in one sample but has no BV. Sodium-22 is retained as a COPC in soil.
- Thorium-228, thorium-230, thorium-232, uranium-234, uranium-235/236, and uranium-238 were detected in at least one sample above their respective BVs. These radionuclides are retained as COCPs in soil.

B-2.7.3.2 Radionuclides in Sediment

One sample was collected from sediment and analyzed for radionuclides by gamma spectroscopy and for americium-241, tritium, isotopic plutonium, and isotopic uranium. Table 5.9-1 summarizes the samples collected and the requested analyses for each sample. No radionuclides were detected above their respective BVs or FVs in sediment. Therefore, no radionuclides are retained as COPCs in sediment.

B-2.7.4 Summary of COPCs

Table B-2.7-2 provides a summary of the COPCs at SWMU 39-004(c) by media type.

B-2.7.5 Determination of Extent at SWMU 39-004(c)

B-2.7.5.1 Inorganic Chemicals

Nine inorganic COPCs were identified at SWMU 39-004(c) (Table 5.9-2). The inorganic chemicals detected or detected above BVs at SWMU 39-004(c) are shown in Figure 5.9-2. The distribution of each COPC at SWMU 39-004(c) is discussed below.

- Antimony was not detected above BV at the site.
- Cadmium was detected once in a surface sample at location 39-01251. It was not detected in deeper samples. The DL was elevated in many samples but only slightly above the BV.
- Cyanide had DLs above the BV in the majority of the samples and was detected in one soil sample above the BV collected from the farthest sampling location of transect 11 (location 39-1331), southeast of the site. Cyanide was not detected in deeper samples.
- Mercury had DLs above the BV in the majority of the samples and was also detected above the BV in two soil samples collected from locations northeast of the site, at transect 10 (locations 39-01329 and 39-604758). The sample from location 39-604758, which is collocated with 39-01329, was collected in 2009. The concentrations of mercury decreased with depth.
- Silver had DLs above the BV in the majority of the samples and was also detected above the BV in two soil samples collected from location 39-01250 at 0–0.5 ft bgs (55.1 mg/kg) and location 39-01251 at 0–0.5 ft bgs (4.1 mg/kg). Silver was not detected in deeper samples.
- Thallium had DLs above the BV in a number of samples and was only detected above the BV in one sample collected from location 39-01252. Thallium was not detected in deeper samples.
- Copper, uranium, and zinc were detected above their respective BVs at least one sample. The concentrations of these inorganic chemicals generally decreased with depth and decreased with distance from the firing site. The highest concentrations of copper, uranium, and zinc are located near the firing site.

B-2.7.5.2 Organic Chemicals

- Only one soil sample was analyzed for dioxins and furans. Dioxin/furan congeners were detected at very low concentrations. The concentrations of the detected congeners are below the maximum concentrations of the same congeners detected at DPSAA (LANL 2007, 099175). Concentrations at DPSAA were reviewed by NMED and determined to not warrant additional sampling for dioxins/furans (Chamberlain 2006, 093679; Chamberlain 2006, 093678; Chamberlain 2006, 093677; Chamberlain 2006, 093680; Chamberlain 2006, 095870; Chamberlain 2006, 095867; LANL 2007, 099175; Roberts 2007, 097391; Roberts 2007, 098470; Roberts 2007, 099144).
- Aroclor-1254 was detected below the EQL in one soil sample collected in 2009 (location 39-604758 at 0–1 ft bgs). PCBs were not analyzed in the historical samples.
- RDX was detected below the EQL in one soil sample collected in 2009 (39-604758 at 1–2 ft bgs). Explosives compounds were analyzed in the historical and 2009 samples.
- Benzoic acid, bis(2-chloroethyl)ether, butylbenzylphthalate, and naphthalene were each detected below the respective EQLs in one soil sample collected farther from the firing site. Benzoic acid was detected at a sampling location (39-01334; 0–0.5 ft bgs) along transect 12.

Butylbenzylphthalate was detected at a location (39-01250; 0–0.5 ft bgs) against the hill to the south of the firing site, between transects 12 and 11. Bis(2-chloroethyl)ether and naphthalene were detected at a location (39-01328) along transect 12 at 0.5–0.83 and 0–0.5 ft bgs, respectively.

- Aroclor-1248, Aroclor-1260, bis(2-ethylhexyl)phthalate, and di-n-butylphthalate were detected in two or more soil samples. The detected concentrations of Aroclor-1248 and Aroclor-1260 increased with depth at location 39-604758. The detected concentrations of bis(2-ethylhexyl)phthalate were essentially similar: one was detected against the hill south of the firing site, and three were detected near the firing site, along the adjacent stream channel. The concentrations of di-n-butylphtalate increased at one sample collected in 2009 but were relatively similar along transects 11 and 12.

B-2.7.5.3 Radionuclide Chemicals

Eight radionuclide COPCs were identified at SWMU 39-004(c) (Table 5.9-3). The radionuclides detected or detected above BVs at SWMU 39-004(c) are shown in Figure 5.9-4. The extent of each COPC at SWMU 39-004(c) is discussed below.

- Plutonium-238 and plutonium-239/240 were detected in one soil sample collected in 2009 (39-604759 at 1–2 ft bgs). Isotopic plutonium was not analyzed in the historical samples.
- Sodium-22 was only detected in one sample collected from the farthest north, along the stream channel. Sodium-22 has no BV/FV.
- Thorium-228, thorium-230, and thorium-232 were detected above the BV at one sample collected from a location (39-01324) along transect 10. The concentrations of these radionuclides increased slightly with depth. Thorium-228 was also detected from a sample collected along transect 12 (location 39-01333; 0.5–0.83 ft bgs). The concentrations of thorium-228 between the two locations are relatively similar.
- Uranium-234, uranium 235/236, and uranium-238 were each detected above the BV in two soil samples at location 39-604758 collected in 2009. The concentrations of these radionuclides increased with depth. Isotopic uranium was not analyzed in the historical samples.

B-2.7.5.4 Summary of Extent at SWMU 39-004(c)

Comparison of data identified in historical samples with those identified in the 2009 characterization samples confirmed that active firing activities are dispersing the same contaminants as those dispersed by historical firing activities. For inorganic chemicals, no COPCs were identified in the 2009 samples that had not been identified in the historical samples. For organic chemicals, RDX was not a COPC based on the historical samples but was identified as a COPC because it was detected in one sample collected in 2009; seven dioxin/furan and three PCB congeners are identified as COPCs in the samples collected in 2009, since dioxins/furans and PCBs were not analyzed in the historical samples. For radionuclides, plutonium-238, plutonium-239/240, uranium-234, uranium-235/236, and uranium-238 are identified as COPCs in the 2009 samples, but isotopic plutonium and isotopic uranium were not analyzed in the historical samples.

B-2.8 SWMU 39-004(d) Firing Site

B-2.8.1 Inorganic Chemicals

B-2.8.1.1 Inorganic Chemicals in Soil

Forty-eight soil samples were collected and analyzed for cyanide and TAL metals. Forty-six samples were analyzed for uranium. Two samples were analyzed for nitrate and perchlorate. Table 5.10-1 summarizes the samples collected and the requested analyses for each sample. Figure 5.10-1 shows the locations sampled.

Table 5.10-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BV. The sampling locations and detected concentrations are shown in Figure 5.10-2.

- Barium, beryllium, cobalt, copper, lead, mercury, nickel, uranium, and zinc were reported with at least one detected result or DL above their respective BVs. Five of these inorganic chemicals (beryllium, copper, lead, mercury, and uranium) are retained as COPCs in soil because statistical tests indicated the concentrations were different from background. Results of the Gehan and quantile tests indicated concentrations of barium, cobalt, nickel, and zinc at the site were not different from background; these inorganic chemicals are not retained as COPCs in soil (Table B-2.8-1 and Figure B-2.8-1).
- Antimony, cadmium, cyanide, silver, and thallium were reported with at least one detected result or DL above their respective BVs. The number of samples with detected results was too few for statistical analyses to be performed. Therefore, these inorganic chemicals are retained as COPCs in soil.
- Perchlorate was detected in at least one sample but has no BV. These inorganic chemicals are retained as COPCs in soil. The number of samples with detected results was too few for statistical analyses to be performed. Therefore, perchlorate is retained as a COPC in soil.
- Calcium was detected above the BV in one sample. However, it is not retained as a COPC in soil as its maximum concentration is less than the maximum background concentration and it is an essential nutrient (EPA 1989, 008021).

B-2.8.1.2 Inorganic Chemicals in Qbo

Two samples were collected from Qbo (the Otowi member and Guaje Pumice Bed of the lower Bandelier Tuff). Each sample was analyzed for cyanide, nitrate, perchlorate, and TAL metals. Table 5.10-1 summarizes samples collected and the requested analyses for each sample.

Table 5.10-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BV. The sampling locations and detected concentrations are shown in Figure 5.10-2.

- Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, iron, lead, manganese, mercury, and selenium were reported with at least one detected result or DL above their respective BVs. The number of samples with detected results was too few for statistical analyses to be performed. Therefore, these inorganic chemicals are retained as COPCs in Qbo.

B-2.8.2 Organic Chemicals

B-2.8.2.1 Organic Chemicals in Soil

Forty-eight soil samples were collected and analyzed for organic chemicals. Each sample was analyzed for SVOCs. Forty samples were analyzed for explosives compounds; two samples were analyzed for PCBs, and one sample was analyzed for VOCs. Table 5.10-1 summarizes the samples collected and the requested analyses for each sample.

- Eleven organic chemicals were detected in at least one sample. Table 5.10-3 presents the detected concentrations, and Figure 5.10-3 shows the sampling locations and detected concentrations.
- All 11 detected organic chemicals [4-amino-2,6-dinitrotoluene; 2-amino-4,6-dinitrotoluene; anthracene; Aroclor-1260; bis(2-ethylhexyl)phthalate; chrysene; di-n-butylphthalate; HMX (octahyro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine); PETN; RDX; and TATB (triaminotrinitrobenzene)] are retained as COPCs.

B-2.8.2.2 Organic Chemicals in Qbo

Two samples were collected from Qbo and analyzed for explosives compounds, PCBs, SVOCs, and VOCs. Table 5.10-1 summarizes the samples collected and the requested analyses for each sample.

- Five organic chemicals were detected in at least one sample. Table 5.10-3 presents the detected concentrations and Figure 5.10-3 shows the sampling locations and detected concentrations.
- All five detected organic chemicals (4-amino-2,6-dinitrotoluene; Aroclor-1260; HMX; RDX; and TATB) are retained as COPCs.

B-2.8.3 Radionuclides

B-2.8.3.1 Radionuclides in Soil

Forty-eight soil samples were collected and analyzed for radionuclides. Thirty-two samples were analyzed for radionuclides by gamma spectroscopy. Forty-six samples were analyzed for isotopic thorium. Two samples were analyzed for americium-241, isotopic plutonium, isotopic uranium, and tritium. Table 5.10-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.10-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations are shown in Figure 5.10-4.

- Thorium-228, thorium-230, thorium-232, uranium-234, uranium-235, uranium-235/236, and uranium-238 were detected above the BVs in at least one sample. These radionuclides are retained as COPCs in soil.
- Europium-152 and sodium-22 were detected in at least one sample but have no BV. These radionuclides are retained as COPCs in soil.

B-2.8.3.2 Radionuclides in Qbo

Two samples were collected from Qbo and analyzed for radionuclides by gamma spectroscopy as well as americium-241, isotopic plutonium, isotopic uranium, and tritium. Table 5.10-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.10-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations are shown in Figure 5.10-4.

- Uranium-234, uranium-235/236, and uranium-238 were detected above the BVs in at least one sample. These radionuclides are retained as COPCs in Qbo.

B-2.8.4 Summary of COPCs

Table B-2.8-2 provides a summary of the COPCs at SWMU 39-004(d) firing site by media type.

B-2.8.5 Determination of Extent at SWMU 39-004(d) Firing Site

During historical investigations, SWMUs 39-004(a) and 39-004(d) were sampled as one site because of the nature of activities at these sites. Twelve surface samples were collected from 12 locations at SWMUs 39-004(a) and 39-004(d) within the firing pad area (LANL 2007, 098281). Eighteen samples were collected from the adjacent stream channel from nine locations. Typically, each location was sampled at two depth intervals. The first sample was collected from the surface (0–0.5 ft) and the second from the 0.5- to 0.83-ft interval (LANL 2007, 098281).

Historical samples were also collected along three lines (transects) radiating outward from a central point between the two firing pads to determine the dispersion of contamination beyond the firing pads. The transects radiated outward from a 100-ft-diameter circle encompassing the firing pads to a distance of approximately 600 ft. For SWMU 39-004(d), transect 1 had four locations (39-01294, 39-01295, 39-01296, and 39-01297); transect 2 had four locations (39-01298, 39-01299, 39-01300, and 39-01301); and transect 3 had one location (39-01302). Figure 5.10-1 shows the sampling locations and transects.

The site is an active firing site and an active RCRA operating unit. Because the extent of contamination is affected by continuing operations, limited characterization sampling was performed. Samples were collected from two locations at two depths, 0–1 and 1–2 ft bgs.

To investigate the migration of contaminants downgradient of SWMU 39-004(d), the historical and new limited characterization samples are considered in three ways: (1) samples along each transect are compared; (2) samples at location 39-604510 and along transect 2 are compared; and (3) samples at location 39-604509 and along transect 3 are compared.

B-2.8.5.1 Inorganic Chemicals

The inorganic COPCs detected above the BVs along transect 1 were cadmium, mercury, silver, and uranium. The concentration of silver and uranium increased with distance from the firing site, and the concentration of cadmium and mercury generally remained the same with distance.

- Silver was detected above the BV in two samples, with the concentration increasing from 2.1 mg/kg (location 39-01295) to 3.1 mg/kg (location 39-01297) at 0–0.5 ft bgs with increasing distance from the firing site.

- Uranium was detected above the BV in each sample. The concentration increased considerably (from 8.9 mg/kg to 2796 mg/kg at 0–0.5 ft bgs) with increasing distance from the firing site. At the two locations at which samples were taken at two depths, the concentration increased with depth in one instance (location 39-01294) and decreased at the other (location 39-01296).
- Mercury was detected just above its BV in two samples, each at 0.11 mg/kg at locations 39-01295 and 39-01296 at 0–0.5 ft bgs. These locations are the second and third farthest locations from the firing site. Cadmium was detected above the BV in one sample (location 39-01295 at 0–0.5 ft bgs). This location is the second farthest location from the firing site.

The inorganic COPCs detected above the BVs along transect 2 were antimony, copper, mercury, and uranium. The concentrations generally decreased with distance from the firing site. The concentration of antimony first increased then decreased with distance from the firing site.

- Antimony was detected above the BV at location 39-01300 at 0–0.5 ft bgs with the concentration decreasing with depth. This location is the third farthest from the firing site of the four locations along transect 2. The concentration decreased with distance from this location.
- Copper was detected well above the BV in one sample at 0–0.5 ft bgs at the location nearest the firing site (77,600 mg/kg at location 39-01298). The concentration decreased with distance and depth. Mercury also was detected above its BV in two samples at this location, with the concentration decreasing with distance and depth.
- Uranium was detected above the BV in each sample. The concentration first increased then decreased with increasing distance from the firing site. At three of the four sampling locations, the concentration decreased with sample depth. At location 39-01299, the concentration increased with increased depth (from 39.3 mg/kg at 0–0.5 ft bgs to 137 mg/kg at 0.5–0.83 ft bgs).

The inorganic COPCs detected above the BVs at the transect 3 location (39-01302) were beryllium, copper, lead, mercury, and uranium. Samples were obtained at two depths (0–0.5 and 0.5–0.83 ft bgs). The concentrations of copper, lead, mercury, and uranium decreased with depth. The concentration of beryllium increased with depth.

- Copper, lead, and mercury were detected above the BV at 0–0.5 ft bgs and not detected above the BV at depth. Uranium was detected above the BV in each sample, with the concentration decreasing from 61.9 to 10.3 mg/kg with increasing depth.
- Beryllium was detected above the BV at 0.5–0.83 ft bgs and not detected above the BV at 0–0.5 ft bgs.

At location 39-604510, which is upgradient of the transect 2 locations:

- Copper, lead, and mercury were detected above the BV in soil and Qbo with concentrations decreasing with depth. Beryllium was detected above its BV in the soil and Qbo; the concentration was nearly the same with depth. Cadmium was detected above the BV in soil and not detected above the BV in Qbo. Barium was detected above the BV in Qbo but not in soil; the concentration increasing with depth. Of these constituents, only copper and mercury were also detected in samples along transect 2. The concentration of copper increased from 984 mg/kg at location 39-604510 at 0–1 ft bgs to 77,600 mg/kg at location 39-01298 at 0–0.5 ft bgs before decreasing again with distance from the firing site.

- Antimony was not detected above the BV in the soil or Qbo at location 39-604510. Antimony was detected above the BV at location 39-01300 along transect 2 but was not detected above the BV at the farthest point from the firing site along the transect.
- The samples at location 39-604510 were not analyzed for uranium.

At location 39-604509, which is upgradient of the transect 3 location:

- Copper and mercury were detected above the BV in the soil and Qbo and decreased with depth. For both COPCs, the concentration in soil decreased from location 39-604509 to the transect 3 location (39-01302).
- Beryllium and lead were not detected above the BV in soil and Qbo. Beryllium and lead were detected above the BV at transect 3. Therefore, the concentration increased with distance from the firing site.
- Perchlorate was detected in the soil and not in the Qbo, so the concentration decreased with depth. The transect 3 samples were not analyzed for perchlorate.
- Barium, chromium, iron, and manganese were detected above the BV in Qbo but not in the soil, so the concentration increased with depth. These COPCs were not detected above the BV at the transect 3 location, so the concentrations decreased with distance from the firing site.
- Zinc was detected above the BV in soil but not in Qbo, so the concentration decreased with depth. Zinc was not detected above the BV at the transect 3 location, so the concentration decreased with distance from the firing site.
- The samples at location 39-604509 were not analyzed for uranium.

To determine whether the active firing activities are dispersing the same contaminants as those dispersed by historical firing activities, the COPCs based on the historical samples are compared with those from the new limited characterization samples. Based on the historical investigations, 14 inorganic COPCs were identified at SWMU 39-004(d): antimony, barium, beryllium, cadmium, cobalt, copper, cyanide, lead, mercury, nickel, silver, thallium, uranium, and zinc. The 14 inorganic COPCs identified in the four new limited characterization samples were antimony, arsenic, barium, beryllium, cadmium, chromium, copper, iron, lead, manganese, mercury, perchlorate, selenium, and zinc.

Of these COPCs, chromium, iron, manganese, and perchlorate were detected or detected above its BV in the new samples but not in the historical samples. However, except for perchlorate, each of these COPCs was detected in Qbo at 1–2 ft bgs but not in the soil samples, and no historical samples were collected at 1–2 ft bgs. Perchlorate was detected in soil in the new samples, but the historical samples were not analyzed for perchlorate. Uranium was detected in soil in the historical samples, but the new samples were not analyzed for uranium. Therefore, for constituents for which samples were analyzed in both the historical and the new samples, no COPCs were identified in the new samples that were not identified in the historical samples.

B-2.8.5.2 Organic Chemicals

Comparing samples along transects 1, 2, and 3, only HMX was detected along transect 1 at location 39-01296 at 0–0.5 ft bgs. The concentration decreased with depth and with distance, since HMX was not detected beyond this location along the transect.

No organic COPCs were detected along transect 2. At location 39-604510, upgradient of the transect 2 locations, 2-amino-4,6-dinitrotoluene; bis(2-ethylhexyl)phthalate; di-n-butylphthalate; and PETN were detected only in soil below the EQL. The chemicals 4-amino-2,6-dinitrotoluene; HMX; RDX; and TATB were detected in soil and Qbo at location 39-604510. Except for RDX, the concentrations decreased with depth.

No organic COPCs were detected along transect 3. At location 39-604509, upgradient of the transect 3 location, Aroclor-1260 was detected below the EQL in the soil and in Qbo, and the concentration decreased with depth.

To determine whether the active firing activities are dispersing the same contaminants as those dispersed by historical firing activities, the COPCs based on the historical samples are compared with those from the new limited characterization samples. Based on the historical investigations, four organic COPCs were identified at SWMU 39-004(d) (anthracene, chrysene, HMX, and RDX). The nine organic COPCs identified in the four new limited characterization samples were 4-amino-2,6-dinitrotoluene; 2-amino-4,6-dinitrotoluene; Aroclor-1260; bis(2-ethylhexyl)phthalate; di-n-butylphthalate; HMX; PETN; RDX; and TATB.

Of these COPCs, 4-amino-2,6-dinitrotoluene; 2-amino-4,6-dinitrotoluene; Aroclor-1260; bis(2-ethylhexyl)phthalate; PETN; and TATB were detected in the new samples but not in the historical samples. 4-amino-2,6-dinitrotoluene; Aroclor-1260; HMX; RDX; and TATB also were detected in Qbo at 1–2 ft bgs. However, no historical samples were collected at 1–2 ft bgs, and the historical samples were not analyzed for Aroclor-1260, PETN, and TATB. Therefore, for COPCs for which samples were analyzed in both the historical and the new samples, 4-amino-2,6-dinitrotoluene; 2-amino-4,6-dinitrotoluene; bis(2-ethylhexyl)phthalate; and di-n-butylphthalate were identified in the new samples that were not identified in the historical samples.

B-2.8.5.3 Radionuclides

Comparing samples along transects 1, 2, and 3:

- Europium-152 was detected at three of four locations along transect 2 at 0.5–0.83 ft bgs at location 39-01298 and at 0–0.5 ft bgs at locations 39-01299 and 39-01300. The concentration decreased with distance from the firing site at 0–0.5 ft bgs and at depth. Europium-152 was not detected along transect 1. The transect 3 samples were not analyzed for europium-152.
- Thorium-228 was detected above the BV along transect 2 in two samples at location 39-01298. This location is closest to the firing site, and the concentration increased slightly with depth but decreased with distance. Thorium-228 was detected above the BV in two samples at the transect 3 location. The concentration decreased slightly with depth. Thorium-228 was not detected above the BV along transect 1.
- Thorium-230 was detected above the BV in two samples at the transect 3 location. The concentration decreased slightly with depth. Thorium-230 was not detected above the BV along transects 1 and 2.
- Thorium-232 was detected above the BV along transect 2 at 0.5–0.83 ft bgs at location 39-01298, which is closest to the firing site. The concentration increased with depth but decreased with distance. Thorium-232 was detected above the BV in two samples at the transect 3 location. The concentration was essentially unchanged with depth. Thorium-232 was not detected above the BV along transect 1.

- Uranium-235 was detected above the BV along transect 1 at 0–0.5 ft bgs at location 39-01297, which is the location farthest from the firing site. The concentration decreased with depth. Uranium-235 was detected above its BV at the transect 3 location at 0–0.5 ft bgs, the concentration decreasing with depth. Samples along transect 2 were not analyzed for uranium-235.

The new samples at location 39-604510 and the historical samples along transect 2, which lie downgradient of location 39-604510 and the firing site, are compared. At location 39-604510, uranium-234, uranium-235/236, and uranium-238 were detected above its BV in the soil and Qbo. However, the samples along transect 2 were not analyzed for these radionuclide COPCs.

The new samples at location 39-604509 and the historical samples along transect 3 (location 39-01302), which lie downgradient of the firing site, are compared. At location 39-604509, uranium-234, uranium-235/236, and uranium-238 were detected above the BV in the soil and Qbo, and the concentrations decreased with depth. The samples along transect 3 were not analyzed for these radionuclide COPCs. These samples were analyzed for uranium-235, which was detected above the BV at the transect 3 location at 0–0.5 ft bgs. The samples at location 39-604509 were not analyzed for uranium-235.

To determine whether the active firing activities are dispersing the same contaminants as those dispersed by historical firing activities, the COPCs based on the historical samples are compared with those from the new limited characterization samples. Based on the historical investigations, six radionuclide COPCs were identified at SWMU 39-004(d) (europium-152, sodium-22, thorium-228, thorium-230, thorium-232, and uranium-235). The three radionuclide COPCs identified in the four new limited characterization samples were uranium-234, uranium-235/236, and uranium-238. Each of these radionuclides was detected above the BVs in the soil. In Qbo, uranium-234, uranium-235/236, and uranium 238 were detected above its BV.

Of these COPCs, uranium-234, uranium-235/236, and uranium 238 were detected in the new samples. However, the historical samples were not analyzed for these constituents. In addition, no historical samples were obtained at 1–2 ft bgs. Therefore, for COPCs for which samples were analyzed in both the historical and the new samples, no COPCs were identified in the new samples that were not identified in the historical samples.

B-2.8.5.4 Summary of Extent at SWMU 39-004(d) Firing Site

Generally, COPCs identified from the new limited characterization samples were not identified at the downgradient transect locations. For inorganic COPCs, only copper and mercury were identified at the locations of the new limited characterization samples and the downgradient transect locations. Organic COPCs were identified at the locations of the new limited characterization samples; however, no organic COPCs were identified in the associated downgradient transect locations. Radionuclide COPCs were identified at the locations of the new limited characterization samples. However, samples along the transects were not analyzed for these radionuclide COPCs.

Comparison of COPCs identified in historical samples with those identified in the new limited characterization samples provided information to confirm that active firing activities are dispersing the same contaminants as those dispersed by historical firing activities. For inorganic and radionuclide COPCs for which samples were analyzed in both the historical and the new samples, no COPCs were identified in the new samples that were not identified in the historical samples. For organic COPCs for which samples were analyzed in both the historical and the new samples, four COPCs were identified in

the new samples that were not identified in the historical samples [4-amino-2,6-dinitrotoluene; 2-amino-4,6-dinitrotoluene; bis(2-ethylhexyl)phthalate; and di-n-butylphthalate].

B-2.9 SWMU 39-005 Former High Explosives Seepage Pit

B-2.9.1 Inorganic Chemicals

B-2.9.1.1 Inorganic Chemicals in Soil

Thirty-nine soil samples were collected and analyzed for pH, nitrate, cyanide, TAL metals, and perchlorate. Table 5.11-1 summarizes the samples collected and the requested analyses. Figure 5.11-1 shows the locations sampled.

Table 5.11-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals without BVs. Sampling locations and detected concentrations are shown in Figure 5.11-2.

- Calcium, mercury, and zinc were reported with detected results above the BV. Cyanide was reported with DLs slightly above the BV but has no maximum background concentration. Mercury and cyanide have been retained as COPCs in soil. Calcium and zinc are not retained as COPCs because the results of the Gehan and quantile tests indicated the concentrations of these chemicals at the site were not different from background (Table B-2.9-1 and Figure B-2.9-1).
- Nitrate was detected in eight samples with concentrations within the range of what is expected to occur naturally. It is not retained as a COPC in soil.

B-2.9.1.2 Inorganic Chemicals in Qbo

Seven samples were collected from the Bandelier Tuff in Qbo and analyzed for pH, nitrate, cyanide, TAL metals, and perchlorate. Table 5.11-1 summarizes the samples collected and the requested analyses.

Table 5.11-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals without BVs. Sampling locations and detected concentrations are shown in Figure 5.11-2.

- Antimony, arsenic, cyanide, and selenium were reported with DLs above BV. Antimony and cyanide were not retained as COPCs because the maximum DLs were only slightly above BV (i.e., within 20%). Arsenic and selenium are retained as COPCs in Qbo.
- Chromium, copper, and nickel were reported with detected results above the BV. These inorganic chemicals have been retained as COPCs in Qbo.
- Nitrate was detected in at four samples with concentrations within the range of what is expected to occur naturally. It is not retained as a COPC in Qbo.

B-2.9.2 Organic Chemicals

B-2.9.2.1 Organic Chemicals in Soil

Thirty-nine soil samples were collected and analyzed for explosives compounds, VOCs, SVOCs, and PCBs. One sample was also analyzed for dioxins and furans. Table 5.11-1 summarizes the samples collected and the requested analyses.

Thirty-two organic chemicals were detected in at least one sample. Table 5.11-3 lists the detected concentrations and Plate 3 shows the sampling locations and detected concentrations.

- All 32 detected organic chemicals [3,5-dinitroaniline; acenaphthene; acetone; 4-amino-2,6-dinitrotoluene; 2-amino-4,6-dinitrotoluene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bromomethane; chrysene; dibenzofuran; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 2-hexanone; indeno(1,2,3-c,d)pyrene; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; phenanthrene, pyrene; RDX; 2,3,7,8-tetrachlorodibenzodioxin; 1,3,5-trinitrobenzene; and 2,4,6-trinitrotoluene) are retained as COPCs in soil.

B-2.9.2.2 Organic Chemicals in Qbo

Seven samples were collected from the Bandelier Tuff in Qbo and analyzed for explosives compounds, VOCs, SVOCs, and PCBs. Table 5.11-1 summarizes the samples collected and the requested analyses.

Eighteen organic chemicals were detected in at least one sample from Qbo. Table 5.11-3 lists the detected concentrations, and Plate 3 shows the sampling locations and detected concentrations.

All 18 organic chemicals are retained as COPCs in Qbo: acenaphthene; acetone; anthracene; Aroclor-1254; 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; naphthalene; phenanthrene; and pyrene.

B-2.9.3 Radionuclides

B-2.9.3.1 Radionuclides in Soil

Thirty-nine soil samples were collected and analyzed for radionuclides by gamma spectroscopy and for isotopic plutonium, isotopic uranium, americium-241, and tritium. Table 5.11-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.11-4 presents the radionuclides detected or detected above BVs/FVs. Sampling locations and detected concentrations are shown in Figure 5.10-3.

- Cesium-137 was detected at levels less than the FV; it has not been retained as a COPC in soil
- Plutonium-238 was detected above the FV; it is retained as a COPC in soil
- Tritium was detected in two samples and has no FV; it is retained as a COPC in soil
- Uranium-234, uranium-235/236, and uranium-238 were detected above the BV and are retained as COPCs in soil.

B-2.9.3.2 Radionuclides in Qbo

Seven samples were collected from the Bandelier Tuff in Qbo and analyzed for radionuclides. Each sample was analyzed by gamma spectroscopy, and for isotopic plutonium, isotopic uranium, americium-241, and tritium. Table 5.11-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.11-4 presents the radionuclides detected or detected above BVs. Sampling locations and detected concentrations are shown in Figure 5.10-3.

- Plutonium-238 was detected and is retained as a COPC in Qbo
- Uranium-235/236 was detected above the BV and is retained as a COPC in Qbo.

B-2.9.4 Summary of COPCs by Media Type

Table B-2.9-2 provides a summary of the COPCs at SWMU 39-005 for soil and Qbo.

B-2.9.5 Determination of Extent

A total of 46 samples were evaluated to determine the extent of contamination at this site: 39 soil samples and seven Qbo samples.

B-2.9.5.1 Inorganic Chemicals

Seven inorganic COPCs were identified for SWMU 39-005 (Table B-2.9-2).

- Arsenic, cyanide, and selenium were not detected above BV at this site.
- Chromium was detected above the BV at three sampling locations, with only one detection found in the deepest samples from the site. It was not detected above the BV in any downgradient sampling locations. Therefore, lateral and vertical extent are defined for chromium.
- Copper had one sample with a detected result greater than the BV. No other detections were above background in the surrounding or downgradient sampling locations. Lateral and vertical extent are defined for copper.
- Mercury was detected above the BV at sampling location 39-604836, located inside the SWMU boundary. Mercury concentrations decrease with depth at this location and were not detected above background downgradient of this sampling location. Therefore, lateral and vertical extent are defined for mercury.
- Nickel was detected above the BV at the two sampling locations farthest upgradient, with no detections downgradient of these locations. It was detected above the BV once in the deepest samples from the site. Lateral and vertical extent are defined for nickel.

B-2.9.5.2 Organic Chemicals

Thirty-two organic COPCs were identified for SWMU 39-005 (Table B-2.9-2).

- Five dioxin/furan congeners were detected at very low concentrations. The concentrations of the detected congeners are below the maximum concentrations of the same congeners detected at DPSAA (LANL 2007, 099175). Concentrations at DPSAA were reviewed by NMED and determined to not warrant additional sampling for dioxins/furans (Chamberlain 2006, 093679; Chamberlain 2006, 093678; Chamberlain 2006, 093677; Chamberlain 2006, 093680; Chamberlain 2006, 095870; Chamberlain 2006, 095867; LANL 2007, 099175; Roberts 2007, 097391; Roberts 2007, 098470; Roberts 2007, 099144). Therefore, the extent of dioxins and furans at the site does not need to be further defined.

- Ten organic COPCs were detected in six or fewer samples at concentrations generally at or below the applicable EQL: 3,5-dinitroaniline; acenaphthene; acetone; Aroclor-1254; bromomethane; dibenzofuran; fluorene; 2-hexanone; 2-methylnaphthalene; and naphthalene. An exception is acetone, which had two detections above the EQL. However, concentrations for these COPCs generally decrease or remain constant both at depth and downgradient. Therefore, lateral and vertical extent are defined for these COPCs.
- The chemicals 4-amino-2,6-dinitrotoluene; 2-amino-4,6-dinitrotoluene; and 2,4,6-trinitrotoluene were detected inside the SWMU boundary (sampling location 39-604836) in the 6- to 8-ft- and 8- to 10-ft-bgs intervals. The chemical 1,3,5-trinitrobenzene was also detected at this location in the 8- to 10-ft-bgs interval. These detections were below the EQLs. There were no other detections downgradient or at the same depths at nearby sampling locations. Therefore, lateral and vertical extent are defined.
- Anthracene was detected in seven samples at concentrations less than the EQL. All detections were in the 0- to 4-ft-bgs intervals with decreasing concentrations downgradient and with depth. Therefore, lateral and vertical extent are defined.
- Benzo(a)anthracene and benzo(a)pyrene were detected in 25 samples at concentrations greater than the EQL. Concentrations generally decrease both at depth and downgradient. Therefore, lateral and vertical extent are defined for these COPCs.
- Benzo(b)fluoranthene was detected in 24 samples, with the maximum concentration at the sampling location nearest SWMU 39-007(b) in the 0- to 1-ft-bgs interval (location 39-604837). Concentrations generally decrease downgradient and with depth to levels below the EQL. Lateral and vertical extent are defined for benzo(b)fluoranthene.
- Benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, and phenanthrene were detected in several samples concentrations generally decrease both downgradient of SWMU 39-007(b) and with depth. Therefore, lateral and vertical extent are defined for these COPCs.
- 4-Isopropyltoluene was detected at one sampling location (location 39-604836) in the 0- to 1-ft and 1- to 2-ft-bgs intervals. It was nondetected at all other sampling locations and at all other depths. Lateral and vertical extent are defined for 4-isopropyltoluene.
- Methylene chloride was detected at levels greater than the EQL at two sampling locations but was not detected at the farthest downgradient location (39-604839). Concentrations decrease with depth. Therefore, lateral and vertical extent are defined for methylene chloride.
- Pyrene was detected in 25 samples, with the maximum concentration at the sampling location 39-604838. Concentrations generally decrease or remain constant downgradient and away from SWMU 39-007(b) as well as with depth to levels below the EQL. Lateral and vertical extent are defined for pyrene.
- RDX was detected at two sampling locations in the 8- to 10-ft bgs interval (locations 39-604832 and 39-604834) at concentrations below the EQL. There were no other detections at the sample depth at nearby sampling locations or at the sampling location farthest downgradient. Lateral and vertical extent are defined for RDX.

B-2.9.5.3 Radionuclides

Five radionuclide COPCs were identified for SWMU 39-005 (Table B-2.9-2).

- Plutonium-238 was detected at three of the eight sampling locations. No detections were found in samples below 6 ft bgs or in the sampling locations farthest downgradient. Lateral and vertical extent are defined for plutonium-238.
- Tritium was detected at two sampling locations nearest SWMU 39-007(b) (locations 39-604837 and 39-604836). It was not detected in the deepest samples at both locations or in samples farthest downgradient. Therefore, lateral and vertical extent are defined for tritium.
- Uranium-234 was only detected at one sampling location in sample depths below 6 ft bgs (location 39-604833). It was not detected at shallower depths at the same location or at any other sampling location. Lateral and vertical extent are defined for uranium-234.
- Uranium-235/236 was detected slightly above the BV at four sampling locations, with one detection in the 8- to 10-ft-bgs interval. There were no other detections at the same depth at nearby sampling locations or at sampling locations farthest downgradient. Therefore, lateral and vertical extent are defined for uranium-235/236.
- Uranium-238 was detected below 6 ft at one sampling location (location 39-604833). It was detected in the surface sample at one other location and was not detected downgradient. Therefore, lateral and vertical extent are defined for uranium-238.

B-2.9.5.4 Summary of Extent at SWMU 39-005

The lateral and vertical extent of the inorganic, organic and radiological COPCs are defined for SWMU 39-005.

B-2.10 SWMU 39-006(a) Septic System Active Components

B-2.10.1 Inorganic Chemicals

Six soil samples were collected from soil at three locations and analyzed for anions (nitrates), cyanide, perchlorate, and TAL metals. Table 5.12-1 summarizes samples collected and the requested analyses for each sample. Figure 5.12-1 shows the locations sampled.

Table 5.12-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BV. The sampling locations and detected concentrations are shown in Figure 5.12-2.

- Mercury was detected above its BV in one sample. Since there was only one detected result, statistical tests were not performed. Mercury is retained as a COPC in soil.
- Nitrate was detected in at least one sample but has no BV. Since it was detected at concentrations expected to occur naturally, this inorganic chemical is not retained as a COPC in soil.

B-2.10.2 Organic Chemicals

Seven soil samples were collected at three locations and analyzed for organic chemicals. Six samples were analyzed for explosives compounds, PCBs, SVOCs, and VOCs. One sample was analyzed for

dioxins and furans. Table 5.12-1 summarizes the samples collected and the requested analyses for each sample.

Six organic chemicals were detected in at least one sample from soil. Table 5.12-3 presents the detected concentrations and Figure 5.12-3 shows the sampling locations and detected concentrations.

- All detected organic chemicals are retained as COPCs: 4-amino-2,6-dinitrotoluene, bis(2-ethylhexyl)phthalate; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran.

B-2.10.3 Radionuclides

Six soil samples were collected at three locations and analyzed for radionuclides by gamma spectroscopy. Each sample was also analyzed for americium-241, isotopic plutonium, isotopic uranium, and tritium. Table 5.12-1 summarizes the samples collected and the requested analyses for each sample. No radionuclide COPCs were retained for 39-006(a) active components.

B-2.10.4 Summary of COPCs

Table B-2.10-1 provides a summary of the COPCs at SWMU 39-006(a) septic system active components.

B-2.10.5 Determination of Extent at SWMU 39-006(a) Septic System Active Components

B-2.10.5.1 Inorganic Chemicals

One inorganic COPC were identified at SWMU 39-006(a) septic system active components (Table B-2.10-1).

- Mercury had only one detected result above its BV at a single sampling location (39-604772) at 0-1 ft bgs. Concentrations of mercury decreased with depth and distance from the septic system active components. Therefore, lateral and vertical extent are defined for mercury.

B-2.10.5.2 Organic Chemicals

Two organic COPCs were identified at SWMU 39-006(a) septic tank active components (Table B-2.10-1).

- The chemical 4-amino-2,6-dinitrotoluene was detected below the EQL in one sample at location 39-604771 at 1–2 ft bgs. Therefore, lateral and vertical extent are defined for 4-amino-2,6-dinitrotoluene.
- Bis(2-ethylhexyl)phthalate was detected below the EQL in five samples. The concentrations ranged from 0.051 to 0.11 mg/kg. At locations 39-604771 and 39-604773, the concentrations decreased with depth. At location 39-604772, bis(2-ethylhexyl)phthalate was detected at 1–2 ft bgs but not at 0–1 ft bgs. Therefore, lateral and vertical extent are defined for bis(2-ethylhexyl)phthalate.
- Only one soil sample was analyzed for dioxins and furans. Four dioxin/furan congeners were detected at very low concentrations. The concentrations of the detected congeners are below the maximum concentrations of the same congeners detected at DPSAA (LANL 2007, 099175). Concentrations at DPSAA were reviewed by NMED and determined to not warrant additional

sampling for dioxins/furans (Chamberlain 2006, 093679; Chamberlain 2006, 093678; Chamberlain 2006, 093677; Chamberlain 2006, 093680; Chamberlain 2006, 095870; Chamberlain 2006, 095867; LANL 2007, 099175; Roberts 2007, 097391; Roberts 2007, 098470; Roberts 2007, 099144). Therefore, the nature and extent of dioxins and furans at the site does not need to be further defined.

B-2.10.5.3 Summary of Extent at SWMU 39-006(a) Septic System Active Components

The extent of the inorganic, organic, and radionuclide COPCs are defined for SWMU 39-006(a) septic system active components.

B-2.11 SWMU 39-007(a) Storage Area

B-2.11.1 Inorganic Chemicals in Soil and Fill

Twenty-eight soil and fill samples were collected and analyzed for TAL metals, anions (nitrate), cyanide, and perchlorate. Table 5.13-1 summarizes samples collected and the requested analyses for each sample. Figure 5.13-1 shows the locations sampled.

Table 5.13-2 lists the inorganic chemicals above the BVs and detected inorganic chemicals that have no BV. The sampling locations and detected concentrations are shown in Figure 5.13-2.

- Antimony was reported with DLs above the BV and maximum background concentration. It has been retained as a COPC in soil.
- Cadmium was reported with one detected result above the BV and the DL above the BV. Cadmium could not be tested with the quantile test because of the high percentage of nondetects. It has been retained as a COPC in soil
- Zinc was reported with five detected results above the BV. The results of the Gehan and quantile tests indicated zinc concentrations were not different from background; it has not been retained as a COPC in soil (Table B-2.11-1 and Figure B-2.11-1).
- Nitrate was detected in three samples at the site. Concentrations are within the range of what is expected to occur naturally. It is not retained as a COPC in soil.
- Perchlorate was detected in two samples but has no BV. This inorganic chemical is retained as a COPC in soil.
- Cyanide was reported with DLs above its BV and is retained as a COPC in soil.

B-2.11.2 Organic Chemicals in Soil and Fill

Twenty-eight soil and fill samples were collected and analyzed for organic chemicals. Of these samples, 1 was analyzed for dioxins/furans; 24 were analyzed for VOCs and SVOCs; and 28 were analyzed for PCBs. Table 5.13-1 summarizes the samples collected and the requested analyses.

Seventeen organic chemicals were detected in at least one sample from soil. Table 5.13-3 presents the detected concentrations and Figure 5.13-3 shows the sampling locations and the detected concentrations.

- All 17 organic chemicals are retained as COPCs in soil: acetone; Aroclor-1242; Aroclor-1248; Aroclor-1254; Aroclor-1260; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; chrysene; 1,4-dichlorobenzene; ethylbenzene; fluoranthene; isopropylbenzene; 4-isopropyltoluene; phenanthrene; pyrene; and toluene.

B-2.11.3 Radionuclides in Soil

Twenty-four samples were collected for soil and analyzed for radionuclides and for americium-241, gamma spectroscopy, tritium, isotopic uranium, and isotopic plutonium. Table 5.13-1 summarizes the samples collected and the requested analyses.

No radionuclides were detected above the BVs/FVs. Therefore, no radionuclides are retained as COPCs.

B-2.11.4 Summary of COPCs by Media Type

Table B-2.11-1 shows the results of the statistical comparisons to background. Table B-2.11-2 provides a summary of the COPCs at SWMU 39-007(a).

B-2.11.5 Determination of Extent

B-2.11.5.1 Inorganic Chemicals

Four inorganic COPCs were identified at SWMU 39-007(a) (Table B-2.11-2).

- Antimony and cyanide were not detected above BV at this site.
- Cadmium was detected in one sample at the site. The concentration is less than 2 times the BV and decreased with depth and down gradient. Therefore, lateral and vertical extent are defined for cadmium.
- Perchlorate was detected in two samples. Both concentrations were at the deepest depth collected for the location. Therefore, lateral and vertical extent are defined for perchlorate.

B-2.11.5.2 Organic Chemicals

Seventeen organic COPCs were detected at SWMU 39-007(a) (Table B-2.11-2).

- Acetone; Aroclor-1242; Aroclor-1248; benzo(k)fluoranthene; butybenzylphthalate; chrysene; 1,4-dichlorobenzene; ethylbenzene; fluoranthene; isopropylbenzene; 4-isopropyltoluene; phenanthrene; pyrene; and toluene were detected in one to three samples. All the detections are at concentrations are near or below the EQLs. Therefore, lateral and vertical extent are defined for these analytes.
- Bis(2-ethylhxyl)phthalate was detected in 12 samples at the site. For location 39-604853, the concentration does not decrease with depth and remains essentially the same. However, the concentrations detected are below the EQLs. Samples collected at nearby locations were

nondetected at the same depth interval. All remaining detections are at concentrations below the EQLs

- Aroclor-1254 was detected in 14 samples at the site. Five of the Aroclor-1254 concentrations were greater than the respective EQLs. In the locations where Aroclor-1254 was detected, its concentration decreased with depth and downgradient. For location 39-604853, the concentration does not decrease with depth and remains essentially the same. However, the concentrations detected are below the EQLs. Samples collected at nearby locations were nondetected at the same depth interval. The remaining Aroclor-1254 detections are at concentrations below the EQLs. Therefore, lateral and vertical extent are defined for Aroclor-1254.
- Aroclor-1260 was detected in 16 samples at the site. One of the Aroclor-1260 concentrations was above its respective EQL. In the location where Aroclor-1260 was detected, its concentration decreased with depth and downgradient. For location 39-604853, the concentration does not decrease with depth remains essentially the same. However, the concentrations detected are below the EQLs. Samples collected at nearby locations were nondetected at the same depth interval. The remaining Aroclor-1260 detections were at concentrations below the EQLs. Therefore, lateral and vertical extent are defined for Aroclor-1260.

B-2.11.5.3 Summary of Extent at SWMU 39-007(a) Storage Area

Lateral and vertical extent of the inorganic and organic COPCs are defined for SWMU-007(a) storage area.

B-2.12 AOC 39-007(d) Storage Area

B-2.12.1 Inorganic Chemicals in Soil

Nineteen soil samples were collected and analyzed for pH, nitrate, cyanide, TAL metals, and perchlorate. Table 5.14-1 summarizes the samples collected and the requested analyses.

Table 5.14-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals without BVs. Sampling locations and detected concentrations are shown in Figure 5.14-2.

- Antimony was reported with DLs above the BV and maximum background concentration. Therefore, it is retained as a COPC in soil.
- Cadmium, chromium, and zinc were reported with either a detected result or DL above the BV. Cadmium is retained as COPCs in soil because statistical tests could not be performed because of the high percentage of nondetects. Chromium is not retained as a COPC because the results of the Gehan and quantile tests indicate the concentrations of chromium at this site are not different from background. Zinc is retained as a COPC because the results of the Gehan and quantile tests indicate the concentrations of zinc at this site are different from background (Table B-2.12-1 and Figure B-2.12-1).
- Calcium was reported at concentrations above the BV. However, it is not retained as a COPC in soil as its maximum concentration is less than the maximum background concentration, and it is an essential nutrient (EPA 1989, 008021).
- Cyanide was reported with DLs above the BV. Therefore, it is retained as a COPC in soil.

- Nitrate was detected in eight samples at concentrations within the range of what is expected to occur naturally. It is not retained as a COPC in soil.
- Perchlorate was detected in at least one sample but does not have a BV. It is retained as a COPC in soil.

B-2.12.2 Organic Chemicals in Soil

Nineteen soil samples were collected and analyzed for explosives compounds, VOCs, SVOCs, PCBs, and dioxins/furans. Table 5.14-1 summarizes the samples collected and the requested analyses for each sample.

Thirty-two organic chemicals were detected in at least one sample. Table 5.14-3 lists the detected concentrations and Figure 5.14-3 shows the sampling locations and detected concentrations.

- All 32 detected organic chemicals are retained as COPCs in soil: acetone; anthracene; Aroclor-1242; Aroclor-1254; benzo(a)pyrene; bis(2-ethylhexyl)phthalate; bromomethane; diphenylamine; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; toluene; trichlorofluoromethane; 1,2,4-trimethylbenzene; and 1,3,5-trimethylbenzene.

B-2.12.3 Radionuclides in Soil

Nineteen soil samples were collected and analyzed for radionuclides by gamma spectroscopy and for isotopic plutonium, isotopic uranium, americium-241, and tritium. Table 5.14-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.14-4 presents the radionuclides detected or detected above BVs. Sampling locations and detected concentrations are shown in Figure 5.14-4.

- Cesium-137 was detected at a depth where FVs do not apply. The results of the Gehan and quantile tests indicate concentrations of cesium-137 at the site are not different from background (Table B-2.12-1 and Figure B-2.12-1), and cesium-137 is not retained as a COPC in soil.
- Plutonium-239/240 was detected above the FV in one sample and is retained as a COPC in soil.
- Tritium was detected in four samples and has no FV. It has been retained as a COPC in soil.

B-2.12.4 Summary of COPCs

Table B-2.12-2 provides a summary of the COPCs at AOC 39-007(d) for soil.

B-2.12.5 Determination of Extent for AOC 39-007(d)

A total of 38 samples were evaluated to determine the extent of contamination at this site, with all samples from soil.

B-2.12.5.1 Inorganic Chemicals

Five inorganic COPCs were identified at AOC 39-007(d) (Table B-2.12-2).

- Antimony and cyanide were not detected above BV at this site.
- Cadmium and zinc were each detected above BV in surface samples at two locations. Cadmium was not detected above BV at depth or at sampling locations farthest downgradient. Zinc was detected above BV at one sampling location downgradient of the asphalt pad (location 39-604683), but not at the other two downgradient sampling locations or at depth. Therefore, lateral and vertical extent are defined for these COPCs.
- Perchlorate was detected in one sample on the edge of the asphalt pad in the 1- to 2-ft-bgs interval. There were no other detections in the surrounding sampling locations at the same depth or downgradient. Lateral and vertical extent are defined for perchlorate.

B-2.12.5.2 Organic Chemicals

Thirty-two organic COPCs were identified for AOC 39-007(d) (Table B-2.12-2).

- Twenty-two organic COPCs were detected in five or fewer samples at concentrations generally at or below the applicable EQL: anthracene; benzo(a)pyrene; bromomethane; diphenylamine; fluorene; 1,2,3,4,7,8,9-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin, 1,2,3,7,8,9-hexachlorodibenzodioxin, 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; 4-isopropyltoluene; 2-methylnaphthalene; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; toluene; 1,2,4-trimethylbenzene; and 1,3,5-trimethylbenzene. Concentrations for these COPCs generally decreased both at depth and downgradient. Therefore, lateral and vertical extent for these organic COPCs are defined.
- Four dioxin/furan congeners were detected at very low concentrations in more than five samples. The concentrations of the detected congeners are below the maximum concentrations of the same congeners detected at DPSAA (LANL 2007, 099175). Concentrations at DPSAA were reviewed by NMED and determined to not warrant additional sampling for dioxins/furans (Chamberlain 2006, 093679; Chamberlain 2006, 093678; Chamberlain 2006, 093677; Chamberlain 2006, 093680; Chamberlain 2006, 095870; Chamberlain 2006, 095867; LANL 2007, 099175; Roberts 2007, 097391; Roberts 2007, 098470; Roberts 2007, 099144). Therefore, the extent of these dioxin/furan congeners at the site does not need to be further defined.
- Acetone was detected at five locations with only one detection above the EQL. Acetone was detected in the 1- to 2-ft-bgs interval at two sampling locations (locations 39-604690 and 39-604698). It was not detected at the same sample depth at nearby sampling locations. Acetone was not detected in the downgradient samples. Therefore, lateral and vertical extent are defined for acetone.

- Aroclor-1242 and Aroclor-1254 were detected at two locations in the surface samples and Aroclor-1254 was also detected at one location in the 1- to 2-ft-bgs interval, with concentrations decreasing with depth. Nearby sampling locations were nondetected at the same depth interval, and downgradient sampling locations did not have any detections. Lateral and vertical extent are defined for Aroclor-1242 and Aroclor-1254.
- Bis(2-ethylhexyl)phthalate was detected in 10 samples at concentrations less than the EQL. Concentrations generally decrease or stay the same both with depth and downgradient. Lateral and vertical extent are defined for bis(2-ethylhexyl)phthalate.
- Methylene chloride was detected in 22 samples. All detected concentrations were less than the EQL and either remain constant or change slightly with depth and downgradient. Therefore, lateral and vertical extent are defined for methylene chloride.
- Trichlorofluoromethane was detected in 10 samples. Low-level concentrations remain essentially constant or decrease at depth. The maximum concentrations for trichlorofluoromethane were detected at sampling locations nearest the northernmost corner of the asphalt pad (location 39-604688) and the southernmost downgradient location (location 39-604683) in the 1- to 2-ft-bgs depth interval. These concentrations are 10 times lower than the EQL. Samples collected at locations between these two locations were either lower or nondetected. Therefore, lateral and vertical extent are defined for trichlorofluoromethane.

B-2.12.5.3 Radionuclides

Three radionuclide COPCs were identified for AOC 39-007(d) (Table B-2.12-2).

- Plutonium-239/240 was detected in one sample collected in the 0- to 1-ft-bgs interval. No other detections were noted at any other location. Lateral and vertical extent are defined for plutonium-239/240.
- Tritium was detected at four locations, with three concentrations in the 1- to 2-ft-bgs interval. Concentrations decrease with depth at location 39-604698. There were no downgradient detections. Therefore, lateral and vertical extent are defined for tritium.

B-2.12.5.4 Summary of Extent at AOC 39-007(d)

Lateral and vertical extent of the inorganic, organic and radiological COPCs are defined for AOC 39-007(d).

B-2.13 SWMU 39-008 Gas-Gun Site

B-2.13.1 Inorganic Chemicals

B-2.13.1.1 Inorganic Chemicals in Soil

Forty-nine soil samples were collected and analyzed for cyanide and TAL metals. Twenty-eight samples were also analyzed for pH, nitrates, and perchlorate. Table 5.15-1 summarizes samples collected and the requested analyses.

Table 5.15-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals without BVs. Sampling locations and detected concentrations are shown in Figure 5.15-2.

- Antimony, cadmium, cyanide, lead, selenium, and silver were reported with at least one detected result or DL above their respective BVs. Statistical tests were not performed because there were too few detected values or the detected concentrations were clearly above background. These metals are retained as COPCs in soil.
- Uranium was reported with at least one detected result above its BV. The results of the Gehan and quantile tests indicated that concentrations of uranium at the site are greater than background (Table B-2.13-1 and Figure B-2.13-1). Uranium is retained as a COPC in soil.
- Beryllium, cobalt, copper, and zinc were reported with either a detected result or DL above the BV, but the results of the Gehan and quantile tests indicated concentrations at the site were not different from background. They are not retained as COPCs in soil (Table B-2.13-1 and Figure B-2.13-1).
- Chromium was detected in one sample above the BV. It is retained as a COPC in soil because the data set was insufficient for the quantile test.
- Thallium and mercury were reported with DLs above their respective BV and maximum background concentrations. They are retained as COPCs in soil.
- Nitrate was detected in several samples at concentrations within the range of what is expected to occur naturally. It is not retained as a COPC in soil.

B-2.13.1.2 Inorganic Chemicals in Qbo

Two samples were collected from the Bandelier Tuff in Qbo and analyzed for pH, nitrates, cyanide, TAL metals, and perchlorate. Table 5.15-1 summarizes samples collected and the requested analytes.

Table 5.15-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals without BVs. Sampling locations and detected concentrations are shown in Figure 5.15-2.

- Barium, chromium, iron, manganese, nickel, and zinc were reported with at least one detected result above the BV. There were too few samples to perform statistical tests. They are retained as COPCs in tuff.
- Calcium was detected above the BV. Calcium is not retained as a COPC in tuff because it is an essential nutrient (EPA 1989, 008021).
- Nitrate was detected in several samples at concentrations within the range of what is expected to occur naturally. It is not retained as a COPC in tuff.
- Arsenic and selenium were reported with DLs above the BVs. Selenium is retained as a COPC in tuff. Arsenic is not retained as a COPC in tuff because the reported DL was only slightly above the BV.

B-2.13.2 Organic Chemicals

B-2.13.2.1 Organic Chemicals in Soil

Forty-nine soil samples were collected and analyzed for SVOCs; 28 samples were analyzed for explosives compounds, PCBs, and dioxins/furans; and 13 samples were analyzed for VOCs. Table 5.15-1 summarizes the samples collected and the requested analyses for each sample.

Thirty-five organic chemicals were detected in at least one sample. Table 5.15-3 lists the organic chemicals and the detected concentrations, and Figure 5.15-3 shows the sampling locations and detected concentrations.

- All 35 organic chemicals were retained as COPCs: Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzyl alcohol; bis(2-ethylhexyl)phthalate; chrysene; di-n-butylphthalate; 1,2-dichloroethane; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; 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; 4-isopropyltoluene, 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; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; trichlorofluoromethane; 1,3,5-trimethylbenzene; and tris(o-cresyl)phosphate.

B-2.13.2.2 Organic Chemicals in Qbo

Two samples were collected from the Bandelier Tuff in Qbo and analyzed for explosives compounds, VOCs, SVOCs, PCBs, and dioxins/furans. Table 5.15-1 summarizes the samples collected and the requested analyses for each sample.

Four organic chemicals were detected in at least one tuff sample. Table 5.15-3 lists the organic chemicals and the associated detected concentrations, and Figure 5.15-3 shows the sampling locations and detected concentrations.

- All four organic chemicals detected were retained as COPCs: bis(2-ethylhexyl)phthalate; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzofuran; and 1,2,3,4,6,7,8,9-octachlorodibenzodioxin.

B-2.13.3 Radionuclides

B-2.13.3.1 Radionuclides in Soil

Forty-nine soil samples were collected and analyzed for americium-241, gamma spectroscopy, isotopic plutonium, and isotopic uranium; 21 were analyzed for thorium isotopes; and 28 were analyzed for tritium. Table 5.15-1 summarizes the samples collected and the requested analyses for each sample.

Radionuclides detected or detected above BVs/FVs are presented in Table 5.15-4. Sampling locations and detected concentrations are shown in Figure 5.15-4.

- Americium-241 was detected in one sample above the FV in the 0- to 1-ft-bgs depth interval and was retained as a COPC in soil.
- Cesium-137 and plutonium-239/240 were detected at sampling depths where FVs do not apply. They are retained as COPCs in soil.
- Thorium-228, thorium-230, thorium-232, uranium-235, uranium-235/236, and uranium-238 were detected above their respective BVs and are retained as COPCs in soil.
- Tritium was detected in one sample and is retained as a COPC in soil.

B-2.13.3.2 Radionuclides in Qbo

Two samples were collected from the Bandelier Tuff in Qbo and analyzed for radionuclides by gamma spectroscopy, plutonium isotopes, uranium isotopes, americium-241, and tritium. Table 5.15-1 summarizes the samples collected and the requested analyses for each sample.

Radionuclides were not detected in either of the tuff samples, so there are no radionuclides COPCs in Qbo.

B-2.13.4 Summary of COPCs

Table B-2.13-2 provides a summary of the COPCs at SWMU 39-008 by media type.

B-2.13.5 Extent for SWMU 39-008 Gas-Gun Site

A total of 51 samples were evaluated to determine the extent of contamination at this site: 49 samples from soil and 2 Qbo samples.

B-2.13.5.1 Inorganic Chemicals

Fifteen inorganic COPCs were identified at SWMU 39-008 (Table B-2.13-2).

- Antimony and cyanide were each detected once in samples collected in the 1- to 2-ft-bgs interval, and selenium was detected once in a sample collected from the 0- to 0.5-ft-bgs interval. None of these COPCs were detected in samples downgradient of the SWMU boundary or in the deepest samples collected from this site. Therefore, lateral and vertical extent for these COPCs are defined.
- Barium, iron, and manganese were each detected once in the 1- to 2-ft-bgs depth interval at sampling locations near the cliff face. There were no detections of these COPCs found in the deepest samples from the SWMU or downgradient. Therefore, lateral and vertical extent for these COPCs are defined.
- Cadmium was detected in one surface sample at one location; concentrations decrease with depth to levels less than background. Cadmium concentrations above background were not noted in downgradient sampling locations. Therefore, lateral and vertical extent are defined for cadmium.

- Chromium was detected once in the 0- to 0.83-ft-bgs depth interval and once in the 1- to 2-ft-bgs interval, and nickel was detected twice in the 1- to 2-ft-bgs interval. There were no detections in the sample depth interval at nearby or downgradient sampling locations. Lateral and vertical extent are defined for chromium and nickel.
- Lead was detected above the maximum background concentration at five locations. Concentrations decrease downgradient and with depth and were not detected at the five sampling locations outside the SWMU boundary or in the deepest samples from the SWMU. Therefore, lateral and vertical extent are defined for lead.
- Mercury and thallium were not detected above BV at this site.
- Selenium was detected above its BV in only one surface sample, which was located near the center of the site. Lateral and vertical extent are defined for selenium.
- Silver was detected above its BV at three locations in surface samples (0- to 1-ft-bgs). There were no other detections above background either in the deepest or downgradient samples from this SWMU. Therefore, lateral and vertical extent are defined for silver.
- Uranium was detected above the background and maximum background concentrations in 21 samples at 11 sampling locations. Uranium concentrations generally decrease or remain essentially the same with depth as well as downgradient. Only one sample collected at a location outside the SWMU boundary was analyzed for uranium, and the concentrations detected were similar to those at the nearest sampling locations (30.5 mg/kg at location 39-01359 vs. 32.5 mg/kg at location 39-01347). Therefore, neither lateral nor vertical extent is defined for uranium.
- Zinc was detected above background concentrations in two samples—one near the cliff face and the other near building 39-56 in the 1- to 2-ft-bgs depth interval. No other detections were above background in samples collected at the same depth from locations between these two locations or downgradient. Therefore, lateral and vertical extent are defined for zinc.

B-2.13.5.2 Organic Chemicals

Thirty-five organic COPCs were identified for SWMU 39-008 (Table B-2.13-2).

- Fifteen organic COPCs were detected in five or fewer samples: Aroclor-1260; benzo(a)anthracene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzyl alcohol; chrysene; 1,2-dichloroethane; fluoranthene; 4-isopropyltoluene; phenanthrene; pyrene; trichlorofluoromethane; 1,3,5-trimethylbenzene; and tris(o-cresyl)phosphate. With the exception of fluoranthene, concentrations were less than the applicable EQL and decrease with depth. Fluoranthene was detected at a level greater than the EQL in the 0- to 1-ft-bgs interval sample near the parking lot, but was not detected at any other location and concentrations decrease with depth. Therefore, lateral and vertical extent for these organic COPCs are defined.
- Aroclor-1254 was detected at two sampling locations in both sample intervals (0–1 and 1–2 ft bgs). Its concentrations decrease with depth to levels less than the EQL and were not detected at downgradient sampling locations. Therefore, lateral and vertical extent are defined for Aroclor-1254.
- Bis(2-ethylhexyl)phthalate was detected in 12 samples but only 1 detection was greater than the EQL; this sample was from the 1- to 2-ft-bgs interval at location 39-604714. Although the concentration is higher in the 1- to 2-ft-bgs interval than the 0- to 1-ft-bgs interval at this location,

concentrations above the EQL were not found either at the same depth intervals from nearby sampling locations or downgradient of sampling location 39-604714. Therefore, lateral and vertical extent are defined for bis(2-ethylhexyl)phthalate.

- Di-n-butylphthalate was detected in three samples at three locations. Two of the detections were greater than the EQL: one sample was from a location near building 39-137 in the 0- to 0.83-ft-bgs interval, and the other was from the debris mound in the 0- to 0.83-ft-bgs interval. There were no detections at depth from nearby or downgradient sampling locations. Therefore, lateral and vertical extent are defined for di-n-butylphthalate.
- Sixteen congeners were detected at very low concentrations at 15 locations. The concentrations are below the maximum concentrations of the same congeners detected at DPSAA (LANL 2007, 099175). Concentrations at DPSAA were reviewed by NMED and determined to not warrant additional sampling for dioxins/furans (Chamberlain 2006, 093679; Chamberlain 2006, 093678; Chamberlain 2006, 093677; Chamberlain 2006, 093680; Chamberlain 2006, 095870; Chamberlain 2006, 095867; LANL 2007, 099175; Roberts 2007, 097391; Roberts 2007, 098470; Roberts 2007, 099144). Therefore, the nature and extent of dioxins and furans at the site do not need to be further defined.
- Methylene chloride was detected at two sampling locations in the 1- to 2-ft-bgs interval depth at concentrations slightly above the EQL. No other detections were found at similar depths from nearby or downgradient sampling locations. Therefore, lateral and vertical extent are defined for methylene chloride.

B-2.13.5.3 Radionuclides

Ten radionuclide COPCs were identified for SWMU 39-008 (Table B-2.13-2).

- Americium-241 and tritium were each detected once in surface samples (americium-241 was detected above the BV/FV) with no other detections at depth or downgradient of the detections. Therefore, lateral and vertical extent are defined for americium-241 and tritium.
- Cesium-137 was detected in two samples in the 1- to 2-ft-bgs interval outside the SWMU boundary with no concentrations detected in the same depth interval at nearby sampling locations. Therefore, lateral and vertical extent are defined for cesium-137.
- Plutonium-239/240 was detected in one sample at the 4- to 5-ft-bgs depth. This sample was from a location near the cliff. There were no other detections at depth or downgradient. Therefore, lateral and vertical extent are defined for plutonium-239/240.
- Thorium-228, thorium-230, and thorium-232 were detected at three locations: two on or near the cliff face and one in the debris mound. However, thorium isotopes were not detected in nearby sampling locations at lower sampling depths in, or downgradient of, the debris mound. Therefore, lateral and vertical extent are defined for thorium isotopes.
- Uranium-235, uranium-235/236, and uranium-238 were detected at 15 sampling locations, including four locations outside the SWMU boundary. Sample locations with uranium isotope detections at depths greater than 1 ft bgs are either in the debris mound or in the cliff; the remaining detections are only in surface samples. Therefore, neither vertical nor lateral extent is defined for uranium isotopes.

B-2.13.6 Summary of Extent for SWMU 39-008

Lateral and vertical extent are not defined for total uranium or isotopic uranium. Lateral and vertical extent are defined for the remaining COPCs at SWMU 39-008.

B-2.14 SWMU 39-010 Excavated Soil Dump

B-2.14.1 Inorganic Chemicals

B-2.14.1.1 Inorganic Chemicals in Soil

Forty-two soil samples were collected from 18 locations and analyzed for TAL metals, anions (cyanide and nitrate), and perchlorate. Table 5.16-1 summarizes the samples collected and the requested analyses for the samples. Figure 5.16-1 shows the locations for the samples collected.

Table 5.16-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals without BVs. Sampling locations and detected concentrations are shown in Figure 5.16-2.

- Antimony, beryllium, copper, lead, mercury, and zinc were detected above their respective BVs in at least one sample. Antimony was retained as a COPC because it was detected above its BVs in one sample and there were too few detects for statistical analysis. Beryllium and zinc were not retained as COPCs because the results of the Gehan and quantile tests indicated that the concentrations of these chemicals at the site were not different from background. Copper, lead, and mercury were retained as COPCs because the results of the Gehan and quantile tests indicated that the concentrations of these chemicals at the site were different from background (Table B-2.14-1 and Figure B-2.14-1).
- Cadmium was detected in one sample and has DLs above the BV. It is retained as a COPC in soil because the data set was insufficient for the quantile test.
- Perchlorate was detected in at least one sample but does not have a BV. Perchlorate is retained as a COPC.
- Nitrate was detected in 41 samples at concentrations within the range of what is expected to occur naturally. It is not retained as a COPC in soil.

B-2.14.1.2 Inorganic Chemicals in Sediment

Five samples were collected from three locations and analyzed for TAL metals, anions (cyanide and nitrate), and perchlorate. Table 5.16-2 summarizes the samples collected and the requested analyses for the samples.

- Antimony, cadmium, and selenium were reported with DLs above their respective BVs but were never detected. These inorganic chemicals are retained as COPCs in sediment.
- Perchlorate was detected in at least one sample but does not have a BV. Perchlorate is retained as a COPC in sediment.
- Nitrate was detected in five samples at concentrations within the range of what is expected to occur naturally. It is not retained as a COPC in sediment.

B-2.14.1.3 Inorganic Chemicals in Tuff

Seven samples were collected from five locations and analyzed for TAL metals, anions (cyanide and nitrate), and perchlorate. Table 5.16-1 summarizes the samples collected and the requested analyses for the samples. Table 5.16-2 lists the inorganic chemicals above BV and the detected inorganic chemicals that do not have BV. In Figure 5.16-2, the sampling locations along with detected concentrations are shown.

- Aluminum, arsenic, barium, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, vanadium, and zinc were detected above their respective BVs in at least one sample and are retained as COPCs.
- Perchlorate was detected in three samples but does not have a BV. Perchlorate is retained as COPCs.
- Nitrate was detected in seven samples at concentrations within the range of what is expected to occur naturally. It is not retained as a COPC in tuff.
- Antimony, cadmium and selenium had DLs above their BVs. Antimony, cadmium and selenium are retained as COPCs in tuff.

B-2.14.2 Organic Chemicals

B-2.14.2.1 Organic Chemicals in Soil

Forty-two soil samples were collected from 18 locations and analyzed for SVOCs, PCBs, and explosives compounds. Thirty samples from 14 locations were analyzed for VOCs. One sample from one location was analyzed for dioxins and furans. Table 5.16-1 summarizes the samples collected and requested analyses for the samples. Thirty-six organic chemicals were detected in at least one sample.

- All 36 analytes [4-amino-2,6-dinitrotoluene; 2-amino-4,6-dinitrotoluene; 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; chloromethane; chrysene; di-n-butylphthalate; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; 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; 2-hexanone; HMX; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; phenanthrene; pyrene; RDX; 1,3,5-trimethylbenzene; and 2,4,6-trinitrotoluene] are retained as COPCs.

B-2.14.2.2 Organic Chemicals in Sediment

Five samples were collected from three locations and analyzed for SVOCs, VOCs, PCBs, and explosives compounds. There were no organic chemicals detected in sediment. Table 5.16-1 summarizes the samples collected and requested analyses for the samples.

B-2.14.2.3 Organic Chemicals in Tuff

Seven Qbo samples were collected from five locations and analyzed for VOCs, SVOCs, PCBs, and explosives compounds. Table 5.16-1 summarizes the samples collected and requested analyses for the samples. Table 5.16-3 presents the organic chemicals with their detected concentrations. The sampling locations and detected concentrations are shown in Figure 5.16-3.

- Aroclor-1254, Aroclor-1260, butylbenzylphthalate, di-n-butylphthalate, HMX, RDX, and 2,4,6-trinitrotoluene were detected in at least one sample. All organic chemicals detected are retained as COPCs.

B-2.14.3 Radionuclides

B-2.14.3.1 Radionuclides in Soil

Forty-two soil samples were collected from 18 locations and analyzed for radionuclides by gamma spectroscopy. All samples were also analyzed for tritium, isotopic uranium, and isotopic plutonium. Table 5.16-4 displays the radionuclides detected or detected above BVs/FVs. Figure 5.16-4 shows the locations for these values.

- Cesium-137 was detected in three samples at a depth where the FV does not apply. Cesium-137 is retained as a COPC.
- Uranium-234, uranium-235/236, and uranium-238 were detected in at least one sample above their respective BVs and are retained as COPCs.
- Tritium was detected but has no FV and is retained as a COPC.

B-2.14.3.2 Radionuclides in Sediment

Five sediment samples were collected from three locations and analyzed for radionuclides by gamma spectroscopy and for tritium, isotopic uranium, and isotopic plutonium. No radionuclides were detected or were detected above BV/FV in sediment. Table 5.16-4 summarizes the radionuclides detected or detected above BVs/FVs. Figure 5.16-4 shows the locations for these values.

B-2.14.3.3 Radionuclides in Tuff

Seven Qbo samples were collected from five locations and analyzed for radionuclides by gamma spectroscopy and for tritium, isotopic uranium, and isotopic plutonium. Table 5.16-1 summarizes the samples collected and the requested analyses for each sample. Figure 5.16-4 shows the locations for these radionuclides.

- Uranium-234, uranium-235/236, and uranium-238 were detected in at least one sample above their respective BVs and are retained as COPCs.
- Tritium was detected in one sample and it is retained as a COPC.

B-2.14.4 Summary of COPCs

Table B-2.14-2 provides a summary of the COPCs for SWMU 39-010 by media type.

B-2.14.5 Determination of Extent

B-2.14.5.1 Inorganic Chemicals

Seventeen inorganic chemicals were identified as COPCs at SWMU 39-010 as listed in Table B-2.14-2.

- Aluminum, arsenic, barium, chromium, iron, magnesium, manganese, nickel, vanadium, and zinc were all detected above BV only in tuff samples and not in overlying soil samples. Because the BV is higher for soil than tuff in all cases, concentrations decreased with depth. Lateral extent is defined by concentrations below BV in samples collected downgradient of the site. Lateral and vertical extent are defined for aluminum, arsenic, barium, chromium, iron, magnesium, manganese, nickel, vanadium, and zinc.
- Antimony was detected in one sample. It was not detected in the deeper depths and not detected in surrounding locations. Lateral and vertical extent are defined for antimony.
- Cadmium was detected once in a surface sample at location 39-604437. It was not detected at the deeper sample at this location or at any other location. Therefore, the lateral and vertical extent is defined for cadmium.
- Copper was detected across the site in 26 samples at 13 locations. To the northwest, copper shows decreasing concentrations with depth and laterally to slightly above the BV. Most other locations showed a decreasing trend in the vertical distribution of copper as well. Copper is highest in the deepest depth at location 39-604426 but decreases with depth at the surrounding locations. At location 39-604432, copper is elevated at all three depths but shows a clearly decreasing trend through the three depths. At location 39-604437, the concentration at the second depth interval is significantly elevated but then drops ten-fold at the lowest depth sampled. At locations 39-604439 and 39-604433, copper increases with depth but at adjacent sampling locations is not detected below the surface interval (location 39-604436) or decreases with depth (location 39-604432). Therefore, the lateral extent of copper is defined but the vertical extent is not defined.
- Lead was detected in nine samples at five locations. At location 39-604428, the concentrations decrease with depth, and lead is not detected in other locations in the immediate vicinity. The extent of lead is defined in the north portion of the site. At location 39-0604426, lead is detected at more than twice the BV at the third depth (2.0–3.0 ft). At two locations (39-604432 and 39-604433), the concentrations increase with depth. However, lead was not detected above background at the three adjacent locations (39-604436, 39-604439, and 39-604441) At location 39-604434, lead is detected at the top depth and not at the bottom two depths and also is not detected at two locations to the south. Lateral extent is defined and does not appear to extend beyond the site boundary. Lead concentrations in the center locations of the site show increasing trends with depth, but that trend is not seen in adjacent and surrounding locations. The vertical extent is not defined for lead.
- Mercury was detected in 21 samples at 11 locations. At three locations (39-604432, 39-604426, and 39-604442) mercury concentrations were much higher than background. At location 39-604442, these concentrations decreased with depth. At the other two locations, the concentrations of mercury increased with depth. These two locations were also surrounded by other locations (39-604436, 39-604439, and 39-604433) at which mercury either not was detected above the BV or was detected slightly above BV. Therefore, lateral extent, but not the vertical extent, is defined for mercury.

- Perchlorate was detected in eight samples at three locations. At two locations perchlorate was detected at similar concentrations at the upper and lower samples. The concentrations at the third location showed a decrease from the shallowest to deepest samples. The three locations do not have other detects at the surrounding the locations; therefore, lateral and vertical extent are defined for perchlorate.

- Selenium was not detected above BV at this site.

B-2.14.5.2 Organic Chemicals

Thirty-seven organic chemicals were identified as COPCs at SWMU 39-010 as listed in Table B-2.14-2.

- The chemicals 2-amino-4,6-dinitrotoluene, benzo(g,h,i)perylene; butylbenzylphthalate; chloromethane; and indeno(1,2,3-cd)pyrene were all detected in at least one sample collected at either the first or second depths. The bottom depths did not show detects, indicating a decrease in concentration. The detects were only slightly elevated in all samples. Extent is defined for the four organic chemicals.

- Benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene were detected in two samples at location 39-604441. The detects were slightly elevated but show decreasing trends with depth. Vertical extent is defined. There were no other locations with detects for these chemicals, and lateral extent is defined.

- Benzo(a)pyrene was detected in two samples at location 39-604441. The detects showed a decreasing concentration but the concentration at the bottom depth was elevated and vertical extent is not defined at this location. There are no other detects throughout the site; lateral extent is defined for benzo(a)pyrene.

- The chemicals 4-amino-2,6-dinitrotoluene and 2,4,6-trinitrotoluene were detected in two samples at location 39-604439 and were only slightly elevated. Also, 2,4,6-trinitrotoluene was detected at location 39-604432 at the third depth but well below the EQL. There were no other detects throughout the site. Vertical and lateral extent are defined for these two analytes.

- Aroclor-1254 and Aroclor-1260 showed six detects at three locations. At locations 39-604437 and 39-604432, the detects were found at the top two depths, and Aroclor-1254 and Aroclor-1260 were not detected in the deepest sample. At location 39-604432, the detects appear in the third depth but the concentrations are only slightly elevated. Aroclor was also detected at location 39-604435 at the top depth, indicating a decreasing trend in concentration with depth. Therefore, vertical and lateral extent for Aroclor-1254 and Aroclor-1260 are defined.

- Bis(2-ethylhexyl)phthalate was detected in four samples at three locations in the north-central portion of the site. The three locations are located next to each other. At one location, its concentration increases at the second depth above its EQL. However, bis(2-ethylhexyl)phthalate was not detected in either sample at the location farthest to the drainage side of the site (location 39-604436). This COPC was also not detected at the three sampling locations bordering the three locations with low detected concentrations. Therefore, the lateral extent is defined for this analyte and vertical extent is not defined.

- Di-n-butylphthalate was detected in 15 samples at 10 locations throughout the site. Its concentration decreased with depth at nine locations and increased at the third depth at location 39-604437. The concentration is above the EQL; therefore, vertical extent is not defined. There are no detects in the locations near the boundary lines, indicating the concentration is decreasing

laterally. Therefore, lateral extent is defined, and vertical extent is not defined for di-n-butylphthalate.

- Fourteen congeners were detected in one sample at very low concentrations. The concentrations are below the maximum concentrations of the same congeners detected at DPSAA (LANL 2007, 099175). Concentrations at DPSAA were reviewed by NMED and determined to not warrant additional sampling for dioxins/furans (Chamberlain 2006, 093679; Chamberlain 2006, 093678; Chamberlain 2006, 093677; Chamberlain 2006, 093680; Chamberlain 2006, 095870; Chamberlain 2006, 095867; LANL 2007, 099175; Roberts 2007, 097391; Roberts 2007, 098470; Roberts 2007, 099144). Therefore, the nature and extent of dioxins and furans at the site does not need to be further defined.
- The chemical 2-hexanone was detected in one sample with a concentration below its EQL. It was not detected at any other location throughout the site. Vertical and lateral extent are defined for 2-hexanone.
- HMX was detected in 10 samples at six locations. At locations 39-604426 and 39-604432, concentrations of HMX increase with depth to above the EQL. Four other locations showed a decrease with depth, and concentrations were below the EQL at the bottom depths. Therefore, lateral extent is defined and vertical extent at location 39-604432 is not defined.
- RDX was detected in five samples at four locations, and its concentrations decreased with depth. The detects at the three other locations were again found at the second depths, indicating a decreasing trend with depth. The four locations are in the center of the site; there are no detects downgradient of these locations. Therefore, lateral and vertical extent is defined for RDX.
- The chemical 1,3,5-trimethylbenzene was detected in two samples at two locations at the bottom depths. Both concentrations were below the EQL. The two locations were bound by other locations without detects. Lateral and vertical extent are defined for 1,3,5-trimethylbenzene.

B-2.14.5.3 Radionuclides

Five radionuclides were identified as COPCs at SWMU 39-010 as listed in Table B-2.14-2.

- Cesium-137 was detected in three samples at three locations. The concentrations were detected in the second depth sampled at each location but not in the deepest samples. Therefore, vertical extent is defined. Although the three detects are located on the outer boundaries of the site they are scattered, infrequent, and at low levels (0.1 to 0.2 pCi/g).Therefore, lateral extent of cesium-137 is defined.
- Tritium was detected in three samples at three locations. Location 39-604428 had a detect only at the third depth sampled (2.0–3.0 ft). The two locations next to it did not have detects. The two detects at locations 39-604436 and 39-604439 were at the top two depths sampled and no detects at the bottom depth. Vertical and lateral extent of tritium are defined.
- Uranium-234 was detected in 23 samples at 11 locations throughout the site. Concentrations do not decrease with depth at most locations. The concentrations increase with depth at more than half the locations. There also does not appear to be any pattern that shows the concentrations decrease laterally. The extent of uranium-234 is not defined.
- Uranium-235/236 was detected in 23 samples at 12 locations. At three locations concentrations increased with depth. At the remaining locations, the concentrations stayed relatively the same

and slightly above the BV. There are no patterns of decreasing trends laterally or vertically; the extent of uranium-235/236 is not defined.

- Uranium-238 was detected in 38 samples at 16 locations. There is a definite increase in concentrations for four locations (39-604426, 39-604430, 390604432, and 39-604439). There is no decrease in concentrations laterally as well as vertically. Extent is not defined for uranium-238.

B-2.14.5.4 Summary of Extent

After an evaluation of the extent of SWMU 39-010, the following issues remain:

- Vertical extent is not defined for copper, lead, and mercury at some locations
- Vertical extent at one locations each is not defined for benzo(a)pyrene, bis(2-ethylhexyl)phthalate, and HMX
- Lateral and vertical extent is not defined for di-n-butylphthalate
- Vertical and lateral extent was not defined for uranium-234, uranium-235/236, and uranium-238

B-2.15 Extended Drainages

B-2.15.1 Inorganic Chemicals

B-2.15.1.1 Inorganic Chemicals in Soil

Eight-six soil samples were collected and analyzed for anions (nitrates), cyanide, perchlorate, and TAL metals. Table 5.17-1 summarizes samples collected and the requested analyses for each sample. The sampling locations are shown in Plates 4, 5, and 6 of the investigation report.

Table 5.17-2 lists the inorganic chemicals detected above its BVs and detected inorganic chemicals that have no BV. The sampling locations and detected concentrations are shown in Plates 7, 8, and 9 of the investigation report.

- Beryllium, cadmium, chromium, cobalt, copper, lead, mercury, nickel, and zinc were reported with at least one detected result or DL above their respective BVs. Four of these inorganic chemicals (copper, lead, mercury, and zinc) are retained as COPCs in soil because the statistical tests indicated that the concentrations were different from background. Results of the Gehan and quantile tests indicated concentrations of beryllium, chromium, cobalt, and nickel at the site were not different from background. These inorganic chemicals are not retained as COPCs in soil (Table B-2.15-1 and Figure B-2.15-1). Cadmium was retained as a COPC because the data set was insufficient for the quantile test.
- Antimony and cyanide were reported with at least one detected result or DL above their respective BVs. For antimony, the DLs were above the maximum background concentration. Cyanide has no maximum background concentration. Therefore, these inorganic chemicals are retained as COPCs in soil.
- Nitrate was detected in all soil samples but at concentrations that are likely to reflect naturally occurring levels.
- Perchlorate was detected in at least one sample but has no BV. Perchlorate is retained as a COPC in soil.

B-2.15.1.2 Inorganic Chemicals in Qbo

Two Qbo samples were collected and analyzed for anions (nitrates), cyanide, perchlorate, and TAL metals. Table 5.17-1 summarizes samples collected and the requested analyses for each sample.

Table 5.17-2 lists the inorganic chemicals detected above its BVs and detected inorganic chemicals that have no BV. The sampling locations and detected concentrations are shown in Plates 7, 8, and 9 of the investigation report.

- Antimony, arsenic, copper, and cyanide were reported with at least one detected result or DL above their respective BVs. These inorganic chemicals are retained as COPCs in Qbo.
- Nitrate was detected in both Qbo samples but at concentrations that are likely to reflect naturally occurring levels.

B-2.15.1.3 Inorganic Chemicals in Sediment

A total of 104 sediment samples were collected and analyzed for anions (nitrates), cyanide, perchlorate, and TAL metals. Table 5.17-1 summarizes samples collected and the requested analyses for each sample.

Table 5.17-2 lists the inorganic chemicals detected above BVs and detected inorganic chemicals that have no BV. The sampling locations and detected concentrations are shown in Plates 7, 8, and 9 of the investigation report.

- Cadmium, copper, iron, mercury, vanadium, and zinc were reported with at least one detected result or DL above their respective BVs. Mercury is retained as COPCs in sediment because the statistical tests indicated that the concentrations were different from background. Results of the Gehan and quantile tests indicated concentrations of copper, iron, vanadium, and zinc at the site were not different from background. These inorganic chemicals are not retained as COPCs in sediment (Table B-2.15-1 and Figure B-2.15-1).
- Cadmium was not detected above its BV but had elevated DLs in several sediment samples. It is retained as a COPC in sediment.
- Antimony and selenium were reported with at least one DL above their respective BVs. The number of samples with detected results was too few for statistical analyses to be performed. Antimony and selenium are retained as COPCs in sediment.
- Nitrate was detected in one hundred and one sediment samples, but at concentrations that are likely to reflect naturally occurring levels.
- Perchlorate was detected in at least one sample but has no BV. Perchlorate is retained as a COPC in sediment.

B-2.15.2 Organic Chemicals

B-2.15.2.1 Organic Chemicals in Soil

Eighty-six soil samples were collected and analyzed for explosives compounds, PCBs, and SVOCs. Seventy-one samples were analyzed for VOCs. One sample was analyzed for dioxins and furans. Table 5.17-1 summarizes samples collected and the requested analyses for each sample.

Thirty-six organic chemicals were detected in at least one sample from soil. Table 5.17-3 presents the detected concentrations, and Plates 10, 11, and 12 show the sampling locations and detected concentrations.

- All 36 detected organic chemicals are retained as COPCs: acenaphthene; acetone; anthracene; Aroclor-1242; 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; chloromethane; chrysene; di-n-butylphthalate; dibenz(a,h)anthracene; 1,2-dichlorobenzene; 1,4-dichlorobenzene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; HMX; indeno(1,2,3-cd)pyrene; iodomethane; 4-isopropyltoluene; methylene chloride; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; phenanthrene; pyrene; RDX; styrene; TATB; toluene; trichlorofluoromethane; and 1,2,4-trimethylbenzene.

B-2.15.2.2 Organic Chemicals in Qbo

Two Qbo samples were collected and analyzed for explosives compounds, PCBs, SVOCs, and VOCs. Table 5.17-1 summarizes samples collected and the requested analyses for each sample.

Two organic chemicals were detected in at least one sample from Qbo. Table 5.17-3 presents the detected concentrations, and Plates 10, 11, and 12 show the sampling locations and detected concentrations.

- Both detected organic chemicals are retained as COPCs: bis(2-ethylhexyl)phthalate and PETN.

B-2.15.2.3 Organic Chemicals in Sediment

A total of 104 samples were collected from sediment and analyzed for explosives compounds, PCBs, and SVOCs. Sixty-five samples were analyzed for VOCs. Table 5.17-1 summarizes samples collected and the requested analyses for each sample.

Twenty-two organic chemicals were detected in at least one sample from sediment. Table 5.17-3 presents the detected concentrations, and Plates 10, 11, and 12 show the sampling locations and detected concentrations.

- All 22 detected organic chemicals [acetone; Aroclor-1242; Aroclor-1254; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; bromomethane; butylbenzylphthalate; chloromethane; 2,4-dinitrotoluene; fluoranthene; iodomethane; 4-isopropyltoluene; methylene chloride; 4-nitrotoluene; pyrene; TATB; toluene; trichlorofluoromethane; 1,2,4-trimethylbenzene; and 2,4,6-trinitrotoluene] are retained as COPCs.

B-2.15.3 Radionuclides

B-2.15.3.1 Radionuclides in Soil

Eighty-six soil samples were collected and analyzed for radionuclides. Gamma spectroscopy was performed on each of these samples and each sample was analyzed for americium-241, isotopic uranium, isotopic plutonium, and tritium. Table 5.17-1 summarizes samples collected and the requested analyses for each sample.

Table 5.17-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations are shown in Plates 13, 14, and 15.

- Uranium-234, uranium-235/236, and uranium-238 were each detected above its BV in at least one sample. These radionuclides are retained as COPCs in soil.
- Tritium was detected in at least one sample but has no BV. Tritium is retained as a COPC in soil.

B-2.15.3.2 Radionuclides in Qbo

Two Qbo samples were collected and analyzed for radionuclides. Gamma spectroscopy was performed on each of these samples, and each sample was analyzed for americium-241, isotopic uranium, isotopic plutonium, and tritium. Table 5.17-1 summarizes samples collected and the requested analyses for each sample.

No radionuclides were detected or detected above the BVs in Qbo. Therefore, no radionuclides are retained as COPCs in Qbo.

B-2.15.3.3 Radionuclides in Sediment

A total of 104 sediment samples were collected and analyzed for radionuclides. Gamma spectroscopy was performed on each sample, and each sample was also analyzed for americium-241, isotopic uranium, isotopic plutonium, and tritium. Table 5.17-1 summarizes samples collected and the requested analyses for each sample.

Table 5.17-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations are shown in Plates 13, 14, and 15.

- Uranium-234, uranium-235/236, and uranium-238 were each detected above its BV in at least one sample. These radionuclides are retained as COPCs in sediment.
- Tritium was detected in two sediment samples above its BV. Tritium is retained as a COPC in sediment.

B-2.15.4 Summary of COPCs

Table B-2.15-2 provides a summary of the COPCs at the extended drainages by media type.

B-2.15.5 Determination of Extent

Samples were collected from three areas (northern, central, and southern) along the North Ancho Canyon drainage at 32 locations. At each location, samples were collected along a transect at three points (one on each stream bank and one along the centerline of the channel) and two depths (0–0.5 and 0.5–1 ft bgs); 192 samples were collected. Thirty samples were collected from 10 locations in the northern area. The 10 locations lie along two forks, the west fork (four locations) and the north fork (six locations). The west fork is associated with SWMUs 39-004(b) and 39-004(e), and AOC 39-002(f). The north fork is associated with SWMUs 39-004(a) and 39-004(d), and AOC 39-002(d). Thirty samples were collected from 10 locations in the central area. Five of the 10 locations lie along a tributary channel, which is associated with SWMUs 39-004(c) and 39-007(a), and AOC 39-002(b). The other five locations lie along the main channel, which is associated with SWMUs 39-001(b), 39-008, and 39-010 and AOC 39-002(c). Thirty-six samples were collected from 12 samples in the southern area, which is associated with

SWMUs 39-001(a), 39-002(a), 39-005, and 39-006(a), and AOCs 39-002(a) and 39-007(d). The COPCs within the drainage channel were compared with those of the adjacent SWMUs and AOCs, particularly the active firing sites. SWMUs 39-004(c), 39-004(d), and 39-008 are the active firing sites considered in this report. Samples were collected to a depth of 1 ft bgs, which allows lateral extent to be described. The potential for off-site migration of COPCs through the drainage was evaluated using the distribution of concentrations in soil, sediment, and Qbo along the drainage from north to south. This discussion focused on the COPCs that exceeded residential soil screening levels (SSLs) (NMED 2009, 106420) at the adjacent SWMUs and AOCs to evaluate whether COPCs may be migrating at concentrations that indicate the need for further consideration. Analytical results from storm water collected at the monitoring and gaging stations within the drainage (shown on Plate 1) are provided on the accompanying DVDs.

B-2.15.5.1 Inorganic Chemicals

Nine inorganic COPCs were identified for the extended drainages (Table 5.17-2). Of these COPCs, copper, lead, mercury, perchlorate, and zinc were detected above the BV at locations in the northern, central, and southern areas. Concentrations decreased from north to south along the drainages, and the highest concentrations in each area were associated with nearby sites, including the active firing sites in the northern and central areas. The concentrations were lower downgradient of these sites. In the southern area, the concentrations were generally near the BV. Lead, mercury, and zinc were detected slightly above the BV south of the Laboratory fence and north of NM 4. Perchlorate was detected low concentrations south of NM 4. The distribution of detections does not indicate that COPCs have been transported off-site.

- Antimony, arsenic, cyanide, and selenium were not detected above BV at this site.
- The number of detections and concentration range for copper decreased from north to south. Copper was detected above the BV in 20 samples in the northern area, with concentrations ranging from 20.3 mg/kg to 1650 mg/kg. The highest concentrations were at locations downgradient of the sites along the west fork and near the SWMU 39-004(d) active firing site in the north fork. In the central area, copper was detected above the BV in 12 samples with concentrations ranging from 4 mg/kg to 986 mg/kg. The highest concentrations were found near sites SWMU 39-004(c) and AOC 39-002(b). In the southern area, copper was detected above the BV in only three samples at two locations in the upper portion of the southern area with concentrations near the BV. The extent of copper is defined.
- Cadmium was detected above the BV in three samples at two locations in the extended drainages. Both locations were in the uppermost area of the drainage near SWMU 39-004(d). Therefore, the extent of cadmium is defined.
- The concentration of lead decreased from north to south along the drainages. Lead was detected above the BV at three locations in five samples in the northern area, and at one location in one sample in the central and southern areas. In the northern area, the concentration ranged from 23.2 to 112 mg/kg, with the highest concentrations near SWMU 39-004(d) in the north fork. In the central area, lead was detected slightly above the BV near SWMU 39-004(c) and AOC 39-002(b). In the southern area, lead was detected slightly above the BV at one location south of the Laboratory fence and north of NM 4. The extent of lead is defined.
- The concentration of mercury decreased from north to south. Mercury was detected above the BV in 28 samples in the northern area, with concentrations ranging from 0.114 to 28.2 mg/kg. The detections were mostly at locations downgradient of the sites along the west fork. In the central area, mercury was detected above the BV in three samples at two locations at concentrations

ranging from 0.103 mg/kg to 0.27 mg/kg. One location was near SWMU 39-004(c) and AOC 36-002(b), and the other location was downgradient of sites including SWMUs 39-001(b), 39-008, and 39-010, and AOC 39-002(c). In the southern area, mercury was detected above the BV in 10 samples at five locations. The concentrations ranged from 0.126 mg/kg to 0.501 mg/kg and decreased with distance down the drainage, with the lowest concentration at location 39-604588, south of the Laboratory fence and north of NM 4.The extent of mercury is defined.

- The concentration of perchlorate decreased from north to south. In the northern area, perchlorate was detected in 11 samples at six locations. The concentrations were ranged from 0.000652 mg/kg to 0.0035 mg/kg, with the highest concentrations near SWMU 39-004(d). In the central area, perchlorate was detected in eight samples at five locations. The concentrations ranged from 0.000587 mg/kg to 0.00407 mg/kg. The highest concentrations were downgradient of sites including SWMUs 39-001(b), 39-008, and 39-010, and AOC 39-002(c). In the southern area, perchlorate was detected in 13 samples at seven locations from 0.000583 mg/kg to 0.02 mg/kg. Perchlorate was detected in four samples in sediment at the location south of State Highway 4 from 0.000999 mg/kg to 0.00237 mg/kg. The extent of perchlorate is defined.
- The concentration of zinc decreased from north to south. In the northern area, zinc was detected above the BV in seven samples at three locations at essentially the same concentrations. The locations were near SWMUs 39-004(a), 39-004(b), 39-004(d), and 39-002(d). In the central area, zinc was detected above the BV in six samples at four locations along the tributary channel. The highest concentrations were near SWMU 39-004(c) and AOC 39-002(b) and decreased to near the BV with distance along the channel. In the southern area, zinc was detected in slightly above the BV in four samples at three locations, including two samples at location 39-604588, south of the Laboratory fence and north of NM 4. The extent of zinc is defined.
- To evaluate the potential surface water transport of COPCs from the various SWMUs and AOCs within the North Ancho Canyon Aggregate Area, the inorganic COPCs along the extended drainages are compared with the inorganic COPCs that exceeded the residential SSL at the associated SWMUs or AOCs. For the northern area, copper exceeded the residential SSL at SWMU 39-004(d). Near this site, copper was detected above the BV in three extended drainages samples, indicating possible transport from the site into the northern portion of the drainage. For the central area, lead exceeded the residential SSL at SWMUs 39-004(c) and 39-008. Near SWMU 39-004(c), lead was detected above the BV in one extended drainages sample, indicating possible transport from the site. Near SWMU 39-008, lead was not detected above the BV in the extended drainages samples. For the southern area, lead exceeded the residential SSL at SWMU 39-002(a) Area 1. Near this site, lead was not detected above the BV in the extended drainages samples but was detected above the BV at the next downgradient transect location 39-604588. Copper and lead were not detected above their BVs in any of the six southernmost transects within North Ancho Canyon ephemeral stream channel nor in the samples collected south of NM 4.

B-2.15.5.2 Organic Chemicals

Forty-one organic COPCs were identified for the extended drainages (Table 5.17-3). Concentrations at or near the EQL are considered trace concentrations. An organic COPC concentration that decreases to trace levels is sufficient to demonstrate extent is defined. Three of these COPCs were dioxin and furan congeners. Of the remaining 38 COPCs, 32 were detected below the EQLs in all samples. Six COPCs [acetone, Aroclor-1260, bis(2-ethylhexyl)phthalate, HMX, 4-isopropyltoluene, and TATB] were detected above the EQL along the extended drainage channel. Detections of these COPCs were generally limited

to locations near sites along the drainage channel and were not further detected above the EQL downgradient of the sites. Acetone was detected above the EQL south of the Laboratory fence but was not further detected south of NM 4. Therefore, the COPCs do not appear to have been transported off-site.

- The 32 COPCs detected below the EQLs in all samples were acenaphthene; anthracene; Aroclor-1242; Aroclor-1254; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bromomethane; butylbenzylphthalate; chloromethane; chrysene; di-n-butylphthalate; dibenz(a,h)anthracene; 1,2-dichlorobenzene; 1,4-dichlorobenzene; 2,4-dinitrotoluene; fluoranthene; indeno(1,2,3-cd)pyrene; iodomethane; methylene chloride; 4-nitrotoluene; PETN; phenanthrene; pyrene; RDX; styrene; toluene; 1,2,4-trimethylbenzene; trichlorofluoromethane; and 2,4,6-trinitrotoluene. The extent of these COPCs is defined.
- Acetone was detected in sediment just below the EQL at one location in the central area. Acetone was detected in soil at two locations in the southern area. At location 39-604679, the concentration was below the EQL. At transect 39-604599, which is south of the Laboratory fence and north of NM 4, the concentration was above the EQL. Acetone was not detected in next downgradient location. The extent of this COPC is defined.
- Aroclor-1260 was detected above the EQL in one sample in the tributary channel in the central area downgradient of SWMU 39-004(c) and AOC 39-002(b). Aroclor-1260 also was detected below the EQL at two other locations along the tributary channel. Aroclor-1260 was not detected in the northern or southern area. The extent of Aroclor-1260 is defined.
- Bis(2-ethylhexyl)phthalate was detected below the EQL at six locations in the northern area. In the central area, bis(2-ethylhexyl)phthalate was detected above the EQL at two locations along the tributary channel near and downgradient of SWMU 39-004(c) and AOC 39-002(b). Bis(2-ethylhexyl)phthalate was detected above the EQL at two locations in the southern area. One location was downgradient of AOC 39-007(d) and SWMU 39-005, and the other location was near SWMU 39-001(a) and AOC 39-002(e). These locations are in the upper portion of the southern area; therefore, the extent of this COPC is defined.
- HMX was detected above the EQL at one location in the northern area near SWMU 39-004(d) and AOC 39-002(d). HMX was not detected in the central and southern areas. The extent for this COPC is defined.
- The chemical 4-isopropyltoluene was detected above the EQL at one location in the northern area upgradient of SWMUs 39-004(a) and 39-004(d), and AOC 39-002(d). This COPC was detected below the EQL at one location in the central area and at three locations in the southern area. The extent for this COPC is defined.
- TATB was detected at or below the EQL at two locations in the northern area. TATB was detected above the EQL at one location downgradient of all of the sites in the northern area, SWMUs 39-004(a), 39-004(b) 39-004(d), and 39-004(e) and AOCs 39-002(d) and 39-002(f). TATB was not detected in the central or southern areas. The extent for this COPC is defined.
- Three congeners were detected in the one sample analyzed for dioxins and furans at transect location 39-604565, which is the eastern-most location along the tributary channel in the central area. Dioxin/furan congeners were detected at very low concentrations. The concentrations of the detected congeners are below the maximum concentrations of the same congeners detected at DPSAA (LANL 2007, 099175). Concentrations at DPSAA were reviewed by NMED and

determined to not warrant additional sampling for dioxins/furans (Chamberlain 2006, 093679; Chamberlain 2006, 093678; Chamberlain 2006, 093677; Chamberlain 2006, 093680; Chamberlain 2006, 095870; Chamberlain 2006, 095867; LANL 2007, 099175; Roberts 2007, 097391; Roberts 2007, 098470; Roberts 2007, 099144). Therefore, the nature and extent of dioxins and furans at the site do not need to be further defined.

- To evaluate the potential surface water transport of COPCs from the various SWMUs and AOCs within the North Ancho Canyon Aggregate Area, the organic COPCs detected above the EQL along the extended drainages are compared with the organic COPCs at the associated SWMUs or AOCs that exceeded the residential SSL For the northern area, no organic COPCs at the associated SWMUs and AOCs exceeded the residential SSL. For the central area, Aroclor-1260 exceeded the residential SSLs at SWMUs 39-004(c) and 39-007(a). Near these sites, Aroclor-1260 was detected in the drainage at below the EQL, indicating possible transport from the sites. For the southern area, benzo(a)pyrene exceeded the residential SSL at SWMU 39-005. Benzo(a)pyrene was not detected at any of the locations near this SWMU in the extended drainages samples. Aroclor-1242 exceeded the residential SSL at SWMU 39-001(a). Aroclor-1242 was not detected near this site in the extended drainages samples. Benzo(a)anthracene, benzo(a)pyrene, and dibenz(a,h)anthracene exceeded the residential SSL at SWMU 39-002(a) Area 1. These COPCs were not detected near this site in the extended drainages samples.

B-2.15.5.3 Radionuclides

Four radionuclide COPCs were identified for the extended drainages (Table 5.17-4). Tritium was detected in the northern and southern areas only. Uranium-234 was detected above the BV in the northern and central areas only. Uranium-235/236 and uranium-238 were detected above the BV in the northern, central, and southern areas. Except for tritium, these COPCs were detected at several locations along the extended drainages channels, and the concentrations decreased from north to south along the channels. Tritium was detected at only two locations, one at the southern-most location of the extended drainages area. However, the concentration was lower than that detected at the northern location. Uranium-235/236 was also detected at the southern-most location, but the concentration was only slightly above the BV.

- Tritium was detected in soil at one location in the northern area near SWMU 39-004(d) and AOC 39-002(d). Tritium was not detected in the central area. In the southern area, tritium was detected above the sediment BV at the southern-most location. This location is south of NM 4. The concentration at this location is lower than the concentration detected in the northern area, so the extent of tritium is defined.
- Uranium-234 and uranium-235/236 were detected above the BV at four locations along the west fork in the northern area near SWMUs 39-004(b) and 39-004(e), and AOC 39-002(f), and downgradient of these sites as well as SWMUs 39-004(a) and 39-004(d), and AOC 39-002(d). These COPCs were also detected above the BV at two locations along the north fork near SWMUs 39-004(a) and 39-004(d), and AOC 39-002(d). In the central area, uranium-234 and uranium-235/236 were detected above the BV at two locations along the tributary channel near and downgradient of AOC 39-002(b) and SWMU 39-004(c). These COPCs were not detected above the BV along the main channel. Uranium-234 was not detected above the BV in the southern area. Uranium-235/236 was detected slightly above the BV at the southern-most location in the southern area. This location is south of NM 4. The concentrations decreased with from north to south along the extended drainages. The extent of uranium-234 and uranium-235/236 is defined.

- Uranium-238 was detected above the BV at four locations along the west fork and five locations along the north fork. These locations are near and downgradient of the sites in the northern area including SWMU 39-004(d). In the central area, uranium-238 was detected above the BV at five locations along the tributary channel and at three locations along the main channel. These locations are near and downgradient of the sites in the central area including SWMUs 39-004(c) and 39-008. In the southern area, uranium-238 was detected above the BV at five locations but not at the southern-most location. The concentration of uranium-238 decreased from north to south along the extended drainages. The extent of uranium-238 is defined.
- To evaluate the surface water transport of COPCs from the various SWMUs and AOCs within the North Ancho Canyon Aggregate Area, the radionuclide COPCs detected above the BV along the extended drainages are compared with the radionuclide COPCs at the associated SWMUs or AOCs that exceeded the residential screening action level (SAL). For the northern area, the SWMU 39-004(d) COPCs uranium-235 and uranium-238 exceeded the residential SAL. Near these sites, uranium-235/236 and uranium-238 were detected in soil above the BV, indicating possible transport from these sites. The SWMU 39-010 COPC uranium-238 exceeded the residential SAL. Near this site, uranium-238 was detected above the BV indicating possible transport form this site. For the central area, the SWMU 39-008 COPC uranium-235 exceeded the residential SAL. Near this site, uranium-235/236 was not detected above the BV at these transects. For the southern area, no SWMUs or AOCs had radionuclide COPCs that exceeded the residential SAL.

B-2.15.5.4 Summary of Extent for Extended Drainages

The extent of the inorganic, organic, and radionuclide COPCs is defined for the extended drainages. Concentrations of inorganic COPCs were generally highest near the sites along the drainages, especially near the active firing sites found in the northern and central areas. Concentrations in the southern area were generally near the BV. Detections of organic COPCs were generally limited to locations near the sites along the drainages and were not further detected downgradient of the sites. Detections of the radionuclide COPCs above the BV were more prevalent throughout the extended drainages channels. However, concentrations generally decreased from north to south. Tritium and uranium-235/236 were detected at the southern-most sampling location, south of NM 4. However, the concentration decreased from that detected in the northern area; there were no other detections of these two COPCs in samples collected in the southern area. The distribution of COPC concentrations indicates that COPCs are not migrating out of North Ancho Canyon to the areas across NM 4.

B-2.16 SWMU 39-001(a) Landfill

B-2.16.1 Inorganic Chemicals

Forty-four soil samples were collected from 26 locations. Eight samples were collected from seven locations in 1996 and 31 samples were collected from 19 locations in 2009. Table 5.18-1 summarizes the samples collected and the analyses requested

B-2.16.1.1 Inorganic Chemicals in Soil and Fill

The 1996 samples were analyzed for TAL metals and cyanide. The 2009 samples were analyzed for TAL metals, nitrate, perchlorate, and cyanide.

Table 5.18-2 lists the inorganic chemicals above BV and the detected inorganic chemicals that do not have BV. In Figure 5.18-2, the sampling locations along with detected concentrations are shown.

- Antimony, cyanide, and silver were reported at several locations with DLs above their respective BVs. For antimony, the DLs were above the maximum background concentration. Cyanide and silver have no maximum background concentrations. Therefore, these inorganic chemicals are retained as COPCs in soil and fill.
- Cadmium, mercury, and uranium were detected above their respective BVs in one sample for cadmium and in two samples for mercury and uranium and are retained as COPCs in soil and fill.
- Perchlorate was detected in at least one sample; since perchlorate does not have a BV it is retained as a COPC in soil and fill.

B-2.16.1.2 Organic Chemicals in Soil and Fill

The 1996 samples were analyzed for VOCs, SVOCs, pesticides/PCBs, and HE. The 2009 samples were analyzed for VOCs, SVOCs, PCBs, and explosives compounds, and one sample was analyzed for dioxins and furans. Additional removal and sampling is ongoing for PCBs only at the edge and base of the excavation; therefore, no discussion of extent is presented for the PCBs.

Table 5.18-3 presents the organic chemicals with their detected concentrations. The sampling locations and detected concentrations are shown in Figure 5.18-3.

- Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; 4,4'-DDE; 4,4'-DDT; di-n-butylphthalate; di-n-octylphthalate; dibenz(a,h)anthracene; 1,2,3,4,6,7,8-heptaclorodibenzodioxin; 1,2,3,4,6,7,8-heptaclorodibenzofuran; HMX; indeno(1,2,3-cd)pyrene; iodomethane; 4,4'-methoxychlor; methylene chloride; nitroglycerin; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; and RDX are retained as COPCs in soil and fill.

B-2.16.1.3 Radionuclides in Soil and Fill

Table 5.18-4 presents the radionuclides detected or detected above BV/FV. Figure 5.18-4 presents the sampling locations and detected concentrations.

- Cesium-134, europium-152, and tritium were detected in at least one sample. They are retained as COPCs in soil and fill.
- Uranium-238 was detected in one sample above its BV and is retained as a COPC in soil and fill.

B-2.16.4 Summary of COPCs

Table B-2.16-1 provides a summary of the COPCs for SWMU 39-010 by media type.

B-2.16.5 Determination of Extent at SWMU 39-001(a)

B-2.16.5.1 Inorganic Chemicals

Seven inorganic chemicals were identified as COPCs at SWMU 39-001(a) as listed in Table B-2.16-1.

- Antimony, cyanide, and silver were not detected above BV at this site.
- Cadmium was detected in one sample at location 39-01384 at a depth of 14.0–15.0 ft below the maximum background concentration. It was not detected at any other locations throughout the site. Lateral and vertical extent are defined.
- Mercury was detected in two samples at two locations (39-01387 and 39-604362) at the deepest depths sampled for each location. The locations are at the south end of the excavation pit. The detects are more than 3 times the BV for mercury. There are no other detects; lateral extent is defined. Since the detects were at the deepest depth sampled, vertical extent is not defined.
- Uranium was detected in three samples at three locations. At location 39-01386, uranium was detected only slightly above its BV and was not detected at the next depth sampled. Vertical extent is defined at this location. For locations 39-01384 and 39-01387, uranium was detected in the deepest depths sampled. There were no decreasing trends at any other nearby location. Lateral extent is defined and the vertical extent at these two locations is not defined.
- Perchlorate was detected in seven samples at five locations. Its concentrations decreased with depth at four locations, and it was detected in only the deepest sample at location 39-604359. All concentrations were similar and near the estimated detection limit. Therefore, extent is defined for perchlorate.

B-2.16.5.2 Organic Chemicals

Twenty organic chemicals were identified as COPCs at SWMU 39-001(a) as listed in Table B-2.16-1.

- Aroclor-1242, Aroclor-1254, and Aroclor-1260 were detected in four or more samples, and extent is not defined. Additional sampling is ongoing at this site, and these COPCs will be reevaluated after data are available.
- Benzo(g,h,i)perylene; 4,4'-DDT (dichlorophenyltrichloroethylene); dibenzo(a,h)anthracene; indeno(1,2,3-cd)pyrene; iodomethane; 4,4'-methoxyclor; nitroglycerin; and RDX were detected in only one sample at the deepest samples scattered across various locations throughout the site. All detects were low concentrations and below their EQLs. Extent is defined for these COPCs.
- The chemical 4,4'-DDE (dichlorophenyltrichloroethylene) was detected in one sample at one location, it was slightly above the EQL. Extent is defined for 4,4'-DDE.
- Bis(2-ethylhexyl)phthalate was detected in four samples at three locations, three of which were at the deepest depth sampled. The results were slightly elevated, and all were below the EQL. Extent is defined for bis(2-ethylhexyl)phthalate.
- Di-n-butylphthalate, di-n-octylphthalate, and HMX were detected in two samples at different locations. All concentrations are below their respective EQLs. Extent is defined for di-n-butylphthalate, di-n-octylphthalate, and HMX.
- Methylene chloride was detected in nine samples at seven locations. At location 39-604346, there is a decrease from the 9.0- to 9.5-ft depth interval to the 9.5- to 10.0-ft interval. There is also a

decrease at locations 39-604347 and 39-604350. Most of the sample depths for the other six locations were sampled only at 5.0–6.0 ft. All sample results were also not more than twice their respective EQLs. Therefore, extent is defined for methylene chloride.

- Three congeners were detected in the two samples analyzed for dioxins and furans at very low concentrations. The concentrations of the detected congeners are below the maximum concentrations of the same congeners detected at DPSAA (LANL 2007, 099175). Concentrations at DPSAA were reviewed by NMED and determined to not warrant additional sampling for dioxins/furans (Chamberlain 2006, 093679; Chamberlain 2006, 093678; Chamberlain 2006, 093677; Chamberlain 2006, 093680; Chamberlain 2006, 095870; Chamberlain 2006, 095867; LANL 2007, 099175; Roberts 2007, 097391; Roberts 2007, 098470; Roberts 2007, 099144). Therefore, the nature and extent of dioxins and furans at the site do not need to be further defined.

B-2.16.5.3 Radionuclides

Four radionuclides were identified as COPCs at SWMU 39-001(a) as listed in Table B-2.16-1.

- Cesium-134 and europium-152 were detected in one sample at locations 39-604360 and 39-01384, respectively. Although the detects were found at the bottom depths (7.5–8.0 and 14.0–15.0 ft), at each location they are only slightly elevated. Therefore, extent is defined for cesium-134 and europium-152.
- Tritium was detected in one sample at location 39-604355 at the depth interval 4.85–6.8 ft. A bottom depth sampled at this location did not detect tritium. There are no other locations with a detect for tritium. Therefore, extent is defined for tritium.
- Uranium-238 was detected in one sample at location 39-604362 at the southern end of the excavation. Uranium-238 was not detected at any other location throughout the site; therefore, defining lateral extent. There was only one sample collected at this location. Vertical extent is not defined at location 39-604362.

B-2.16.5.4 Summary of Extent at SWMU 39-001(a)

After an evaluation of the extent of SWMU 39-001(a), the following issues remain.

- Vertical extent is not defined for mercury and uranium at some locations.
- Vertical extent is not defined for uranium-238 at one location.

B-2.17 SWMU 39-001(b) Disposal Trenches

B-2.17.1 Inorganic Chemicals

Sixty-two soil samples were collected and analyzed for pH, nitrate, cyanide, TAL metals, and perchlorate. Table 5.19-1 summarizes the samples collected and the requested analyses. Figure 5.19-1 shows the locations sampled.

Table 5.19-2 lists the inorganic chemicals above BVs and the detected inorganic chemicals without BVs. Sampling locations and detected concentrations are shown in Figure 5.19-2.

- Lead, mercury, vanadium, and zinc were detected above the BV. These inorganic chemicals are retained as COPCs in soil.
- Cyanide had DLs above the BV. It is retained as a COPC in soil.
- Nitrate was detected across the site. Concentrations are within the range of what is expected to occur naturally. It is not retained as a COPC in soil.
- Perchlorate was detected in one sample and has no BV. It is retained as a COPC in soil.

B-2.17.2 Organic Chemicals

Sixty-two soil samples were collected and analyzed for explosives compounds, VOCs, SVOCs, and PCBs. One sample was also analyzed for dioxins and furans. Table 5.19-1 summarizes the samples collected and the requested analyses.

Eighteen organic chemicals were detected in at least one sample. Table 5.19-3 lists the detected concentrations and Figure 5.19-3 shows the sampling locations and detected concentrations.

- All 18 detected organic chemicals are retained as COPCs in soil: acenaphthene; Aroclor-1254; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; HMX; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; phenanthrene; pyrene; RDX; toluene; and 1,2,4-trimethylbenzene.

B-2.17.3 Radionuclides

Sixty-two soil samples were collected and analyzed by gamma spectroscopy and for plutonium isotopes, uranium isotopes, americium-241, and tritium. Table 5.19-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.19-4 presents the radionuclides detected or detected above BVs/FVs. Sampling locations and detected concentrations are shown in Figure 5.19-4.

- Tritium was detected in four samples and has no BV. It has been retained as a COPC in soil.

B-2.17.4 Summary of COPCs

Table B-2.17-1 provides a summary of the COPCs at SWMU 39-001(b) for soil.

B-2.17.5 Determination of Extent

A total of 62 soil samples were evaluated to determine the nature and extent of contamination at this site.

B-2.17.5.1 Inorganic Chemicals

Six inorganic COPCs were identified for SWMU 39-001(b) (Table B-2.17-1).

- Cyanide was not detected above BV at this site.
- Lead, mercury, vanadium, and zinc each had one or two samples with a detected result greater than the applicable BV. With the exception of mercury, these metal concentrations were essentially the same as or less than the maximum background value. Mercury had one detection greater than the maximum BV, but the concentration decreased with depth. There were no other detections above background in the surrounding sampling locations or downgradient. Lateral and vertical extent are defined for these COPCs.
- Perchlorate was only detected in one sample and has no BV. Lateral and vertical extent for perchlorate are defined.

B-2.17.5.2 Organic Chemicals

Eighteen organic COPCs were identified for SWMU 39-001(b) (Table B-2.17-1).

- Fifteen organic COPCs were detected in six or fewer samples at concentrations generally at or below the applicable EQL: acenaphthene; Aroclor-1254; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; HMX; indeno(1,2,3-cd)pyrene; phenanthrene; pyrene; RDX; toluene; and 1,2,4-trimethylbenzene. An exception to this is Aroclor-1254, which had one detection slightly above the EQL but decreased with depth. Therefore, lateral and vertical extent are defined for these COPCs.
- Dioxins and furans were analyzed for only in one sample and were detected at very low concentrations. The concentrations of the detected congeners are below the maximum concentrations of the same congeners detected at DPSAA (LANL 2007, 099175). Concentrations at DPSAA were reviewed by NMED and determined to not warrant additional sampling for dioxins/furans (Chamberlain 2006, 093679; Chamberlain 2006, 093678; Chamberlain 2006, 093677; Chamberlain 2006, 093680; Chamberlain 2006, 095870; Chamberlain 2006, 095867; LANL 2007, 099175; Roberts 2007, 097391; Roberts 2007, 098470; Roberts 2007, 099144). Therefore, the nature and extent of dioxins and furans at the site do not need to be further defined.
- Bis(2-ethylhexyl)phthalate was detected in 13 samples, with only one of these detections greater than the EQL. Concentrations generally decrease both with depth and downgradient of location 39-604404 (the sampling location with the concentration above the EQL). Therefore, lateral and vertical extent are defined for bis(2-ethylhexyl)phthalate.

B-2.17.5.3 Radionuclides

One radionuclide COPC was identified for SWMU 39-001(b) (Table B-2.17-1).

- Tritium was detected at three sampling locations. It was not detected in the deepest samples from these locations or at sampling locations farthest downgradient. Therefore, lateral and vertical extent are defined for tritium.

B-2.18 SWMU 39-006(a) Septic System Inactive Components

B-2.18.1 Inorganic Chemicals in Soil and Fill

Fifty-four soil and fill samples were collected and analyzed for anions, cyanide, perchlorate, and TAL metals. Table 5.20-1 summarizes the samples collected and the requested analyses for each sample. The sampling locations are shown in Figure 5.20-1 for the sand filter and Figure 5.20-2 for the seepage pit and septic tank.

Table 5.20-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BV. The detected concentrations are shown in Figure 5.20-3 for the sand filter and Figure 5.20-4 for the seepage pit and septic tank.

- Cadmium, cyanide, silver, and zinc were detected above their respective BVs in at least one sample. Zinc is not retained in soil and fill because the results of the Gehan and quantile tests indicated concentrations of these chemicals at the site were statistically the same as background (Table B-2.18-1 and Figure B-2.18-1). Cadmium was retained as a COPC because the data set was insufficient for the quantile test. Cyanide and silver are retained in soil and fill because the results of the Gehan and quantile tests indicated that the concentrations of these chemicals at the site were statistically different from background.
- Chromium and lead were detected above their respective BVs in one sample. Chromium and lead are not retained as COPCs in soil and fill because the results of the Gehan and quantile tests indicated that the concentrations of these chemicals at the site were statistically the same as background.
- Nitrate was detected in at least one sample but has no BV (maximum concentration: 68.2 mg/kg). Although it is expected to occur naturally, this inorganic chemical is retained as a COPC in soil and fill because of the high detected concentrations (maximum concentration greater than 20 mg/kg).
- Perchlorate was detected in at least one sample but has no BV. This inorganic chemical is retained as a COPC in soil and fill.

B-2.18.2 Organic Chemicals in Soil and Fill

Fifty-four soil and fill samples were collected and analyzed for explosives, PCBs, SVOCs, and VOCs. The fill sample collected in 1996 was analyzed for pesticides, PCBs, SVOCs, and VOCs. Table 5.20-1 summarizes the samples collected and the requested analyses for each sample. The detected values are shown in Figure 5.20-5 for the sand filter and Figure 5.20-6 for the seepage pit and septic tank.

Thirteen organic chemicals were detected in at least one sample from soil and fill. Table 5.20-3 presents the detected concentrations and Figures 5.20-5 and 5.20-6 show the sampling locations and detected concentrations.

- Thirteen detected organic chemicals are retained as COPCs in soil and fill: acetone; Aroclor-1254; benzene; bis(2-ethylhexyl)phthalate; di-n-butylphthalate; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; iodomethane; 4-isopropyltoluene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; phenol; toluene; and 1,2,4-trimethylbenzene.

B-2.18.3 Radionuclides in Soil and Fill

Fifty-four soil and fill samples were collected and analyzed by gamma spectroscopy and for americium-241, tritium, isotopic plutonium, and isotopic uranium. One sample was collected in 1996 from the fill material and analyzed by gamma spectroscopy and for isotopic uranium. Table 5.20-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.20-4 presents the radionuclides detected above BVs/FVs. The sampling locations and detected concentrations are shown in Figure 5.20-7 for the sand filter and Figure 5.20-8 for the seepage pit and inactive septic tank.

- Cesium-137 was detected in one soil sample, but the FV does not apply at the sampling depth. Cesium-137 is retained as a COPC in soil and fill.
- Tritium was detected in six soil samples but has no FV. Tritium is retained as a COPC in soil and fill.

B-2.18.4 Summary of COPCs

Table B-2.18-2 provides a summary of the COPCs at SWMU 39-006(a) inactive components in soil and fill.

B-2.18.5 Determination of Extent at SWMU 39-006(a) Inactive Components

B-2.18.5.1 Inorganic Chemicals

Five inorganic COPCs were identified at SWMU 39-006(a) inactive components (Table B-2.18-2). The extent of each COPC at SWMU 39-006(a) inactive components are discussed below:

B-2.18.5.1.1 Inactive Chemical Seepage Pit

- Silver was detected in almost all 10 samples above its BV. Concentrations of this COPC increased with depth at locations 39-604868 and 39-604872. The maximum concentrations of silver were located at the center of the pit (location 39-604870). Therefore, the lateral extent for silver is defined, but the vertical extent is not defined for silver at locations 39-604868 and 39-604872.
- Cadmium was detected in almost all 10 samples above its BV. Concentrations increased with depth at locations 39-604868 and 39-604872. Only one sample with detected concentration of cadmium was below the BV. The maximum concentrations are located at the center of the pit. Therefore, the lateral extent for cadmium is defined, but the vertical extent is not defined for cadmium at locations 39-604868 and 39-604872.
- Cyanide was detected in seven samples and reported in two samples with DLs above the BV. Concentrations of cyanide increased with depth at locations 39-604869 and 39-604871 but decreased with depth at locations 39-604868 and 39-604870. Of the five sampling locations associated with the inorganic chemical seepage pit, the maximum concentration was located at the center of the pit from a sample collected at 9.5–10 ft bgs. Therefore, the lateral extent for cyanide is defined, but the vertical extent for cyanide is not defined at locations 39-604869 and 39-604871.

- Nitrate was detected in all samples at low concentrations. However, these values are within the range of nitrate concentrations expected to occur naturally. Therefore, the nature and extent of nitrate are defined.

B-2.18.5.1.2 Inactive Septic Tank

- Cyanide was detected in three soil samples at two locations. Concentrations decreased with depth where cyanide was detected at the same location (39-604874) but increased with depth at location 39-604877. Therefore, the lateral extent for cyanide is defined, but the vertical extent is not defined at location 39-604877.
- Silver was detected in one soil sample collected from location 39-604873 (9.5–10 ft bgs). Silver was not detected in the deeper sample collected from the same location. Therefore, lateral and vertical extent are defined for silver.
- Nitrate was detected in all soil samples at low concentrations. However, these values are within the range of nitrate concentrations (less than about 20 mg/kg) expected to occur naturally. Therefore, the nature and extent of nitrate are defined.

B-2.18.5.1.3 Inactive Sand Filter

- Silver was detected above its BV in five samples collected from four sidewall locations. The concentrations are elevated (10.2 and 2.1 mg/kg) in deeper sidewall samples collected near the outlet of the sand filter (locations 39-604887 and 39-604888). At the other two locations (39-604885 and 39-604891), the concentrations decreased with depth. Therefore, lateral and vertical extent are not defined for silver.
- Cyanide was detected above the BV in 12 samples collected from three excavated surface and six sidewall locations. The concentrations decreased with depth at the three excavated surface locations. The concentrations are elevated (8.2 and 2.82 mg/kg) in deeper sidewall samples collected near the outlet of the sand filter (locations 39-604887 and 39-604888). The concentrations at the other sidewall locations (39-604886, 39-604891, and 39-604893), except for 39-604885, generally decreased with depth. Therefore, lateral and vertical extent are not defined for cyanide.
- Perchlorate was detected in eight samples collected from six sidewall locations at low concentrations. The concentrations generally decrease with depth except at location 39-604892. Therefore, the lateral extent for perchlorate is defined, but the vertical extent is not defined for perchlorate at location 39-604892.
- Nitrate was detected in almost all samples with concentrations ranging from 5.32 to 68.2 mg/kg. The distribution of nitrate is indicative of a site release. Concentrations of nitrate above 20 mg/kg were from samples collected at shallower locations. Therefore, lateral and vertical extent are defined for nitrate.

B-2.18.5.2 Organic Chemicals

Ten organic COPCs were identified at SWMU 39-006(a) inactive components (Table B-2.18-2). Only one sample was analyzed for dioxins and furans. Dioxin/furan congeners were detected at very low concentrations. The concentrations of the detected congeners are below the maximum concentrations of the same congeners detected at DPSAA (LANL 2007, 099175). Concentrations at DPSAA were reviewed

by NMED and determined to not warrant additional sampling for dioxins/furans (Chamberlain 2006, 093679; Chamberlain 2006, 093678; Chamberlain 2006, 093677; Chamberlain 2006, 093680; Chamberlain 2006, 095870; Chamberlain 2006, 095867; LANL 2007, 099175; Roberts 2007, 097391; Roberts 2007, 098470; Roberts 2007, 099144). Therefore, the nature and extent of dioxins and furans at the site do not need to be further defined.

The extent of each COPC at SWMU 39-006(a) are discussed below.

B-2.18.5.2.1 Inactive Chemical Seepage Pit

- Aroclor-1254 and iodomethane were detected below their respective EQLs in one sample collected from the excavated surface (location 39-604872) at 9.5–10 ft bgs. The COPCs were not detected in deeper samples. Therefore, lateral and vertical extent are defined for Aroclor-1254 and iodomethane.
- Acetone was detected in two samples below the EQL collected from an excavated surface location (39-604869) at 9.5–10 and 10–10.5 ft bgs. Concentrations slightly decreased with depth at this location. This COPC was not detected in other samples. Therefore, lateral and vertical extent are defined for acetone.
- Bis(2-ethylhexyl)phthalate was detected in two samples collected from two excavated surface locations (39-604873 and 39-604870) at 9.5–10 ft bgs. The detections at locations 39-604873 (2 mg/kg) and 39-604870 (0.2 mg/kg) were above and below the EQL, respectively. Concentrations decreased with depth at both locations. The COPC was not detected in other samples. Therefore, the vertical extent for bis(2-ethylhexyl)phthalate is defined, but the lateral extent is not defined.
- Three congeners were detected in the one sample analyzed for dioxins and furans. Dioxin/furan congeners were detected at very low concentrations. The concentrations of the detected congeners are below the maximum concentrations of the same congeners detected at DPSAA (LANL 2007, 099175). Concentrations at DPSAA were reviewed by NMED and determined to not warrant additional sampling for dioxins/furans (Chamberlain 2006, 093679; Chamberlain 2006, 093678; Chamberlain 2006, 093677; Chamberlain 2006, 093680; Chamberlain 2006, 095870; Chamberlain 2006, 095867; LANL 2007, 099175; Roberts 2007, 097391; Roberts 2007, 098470; Roberts 2007, 099144). Therefore, the nature and extent of dioxins and furans at the site do not need to be further defined.

B-2.18.5.2.2 Inactive Septic Tank

- Benzene and phenol were detected in the fill sample (historical sample) above their respective EQLs. Neither COPC was detected in any of the excavated surface samples. Therefore, lateral and vertical extent are defined for benzene and phenol.
- Bis(2-ethylhexyl)phthalate and 4-isopropyltoluene were each detected below their respective EQLs in one sample collected from the excavated surface [location 39-604873 for bis(2-ethylhexyl)phthalate and location 39-604874 for 4-isopropyltoluene] at 9.5–10 ft. Neither COPC was detected in deeper samples. Therefore, lateral and vertical extent are defined for bis(2-ethylhexyl)phthalate and 4-isopropyltoluene.
- Acetone and Aroclor-1254 were detected in three or more samples. All acetone detections were below the EQL. Concentrations of acetone and Aroclor-1254 decreased with depth, except at

location 39-604873. Therefore, lateral and vertical extent are defined for acetone and Aroclor-1254, except for the vertical extent at location 39-604873.

B-2.18.5.2.3 Inactive Sand Filter

- Di-n-butylphthalate was detected below the EQL in one sample collected from the deepest side wall location. Therefore, lateral and vertical extent are defined for di-n-butylphthalate.
- Toluene was detected below the EQL in two samples collected from two side wall locations (39-604893 at 1–3 ft bgs and 39-604887 at 6–7 ft bgs). The detected concentrations were essentially the same (0.00047 mg/kg at location 39-604893 and 0.00048 mg/kg at location 39-604887). Therefore, lateral and vertical extent are defined for toluene.
- Aroclor-1254 and 1,2,4-trimethylbenzene were detected in several samples collected from various excavated surface and sidewall locations. All 1,2,4-trimethylbenzene detections were below the EQL. Aroclor-1254 detections collected from the excavated surface locations were below the EQL. Aroclor-1254 detections were above the EQL of sidewall samples collected from locations 39-604887 at 6–7 ft bgs, 39-604888 at 6–9 ft bgs, and 39-604891 at 3–5 ft bgs. Concentrations of Aroclor-1254 increased with depth at locations 39-604887 and 39-604887, and decreased with depth at location 39-604891. Therefore, lateral and vertical extent for Aroclor-1254 are not defined, but lateral and vertical extent for 1,2,4-trimethylbenzene are defined.
- Bis(2-ethylhexyl)phthalate were mostly detected below the EQL in several samples collected from various side wall locations. One detected result (0.54 mg/kg) was above the EQL at location 39-604889 (3–4 ft bgs). However, the concentrations decreased with depth at location 39-604889. The COPC was not detected in any excavated surface samples. Therefore, lateral and vertical extent are defined for bis(2-ethylhexyl)phthalate.

B-2.18.5.3 Radionuclide Chemicals

Two radionuclide COPCs were identified at SWMU 39-006(a) inactive components (Table B-2.18-2). The extent of each COPC at SWMU 39-006(a) are discussed below.

B-2.18.5.3.1 Inactive Chemical Seepage Pit

- Tritium was detected in one soil sample collected from the excavated surface (location 39-604872) at 0.5–1 ft bgs. Tritium was not detected in other samples. Therefore, lateral and vertical extent are defined for tritium.

B-2.18.5.3.2 Inactive Septic Tank

- Tritium was detected in three soil samples collected from the excavated surface locations. Concentrations were relatively the same (no change with depth) at location 39-604874 and decreased with depth at location 39-604877. Therefore, vertical extent for tritium is defined, but the lateral extent is not defined.

B-2.18.5.3.3 Inactive Sand Filter

- Cesium-137 was detected in one soil sample collected from the side wall. The COPC was not detected in the deeper sample at this location or in other samples. Therefore, lateral and vertical extent are defined for cesium-137.
- Tritium was detected in two soil samples collected from the excavated surface (location 39-604883) at 10–10.5 ft bgs and the side wall location (39-604893) at 1–3 ft bgs. Concentrations increased with depth at location 39-604883, but decreased with depth at location 39-604893. Therefore, the vertical extent at location 39-604883 and the lateral extent are not defined for tritium.

B-2.18.5.4 Summary of Extent at SWMU 39-006(a)

The excavation activities met the cleanup criteria established in the work plan. The lateral and vertical extent of all inorganic, radionuclides, and organic COPCs generally are defined for SWMU 39-006(a) but are not defined for several COPCs in the following areas:

- *Inactive Chemical Seepage Pit:* the vertical extent of cadmium and silver at locations 39-604868 and 39-604872 is not defined, the vertical extent of cyanide is not defined at locations 39-604869 and 39-604871, and the lateral extent of bis(2-ethylhexyl)phthalate to the west of location 39-604868 is not defined.
- *Inactive Septic Tank:* the vertical extent of cyanide is not defined at location 39-604877, the vertical extent for acetone is not defined at location 39-604873, and the lateral extent of tritium is not defined.
- *Inactive Sand filter:* the lateral and vertical extent of silver and cyanide are not defined, the vertical extent of perchlorate is not defined at locations 39-604892, the lateral and vertical extent for Aroclor-1254 are not defined, and the vertical extent at location 39-60488 and lateral extent of tritium are not defined.

B-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 New Mexico Environment Department 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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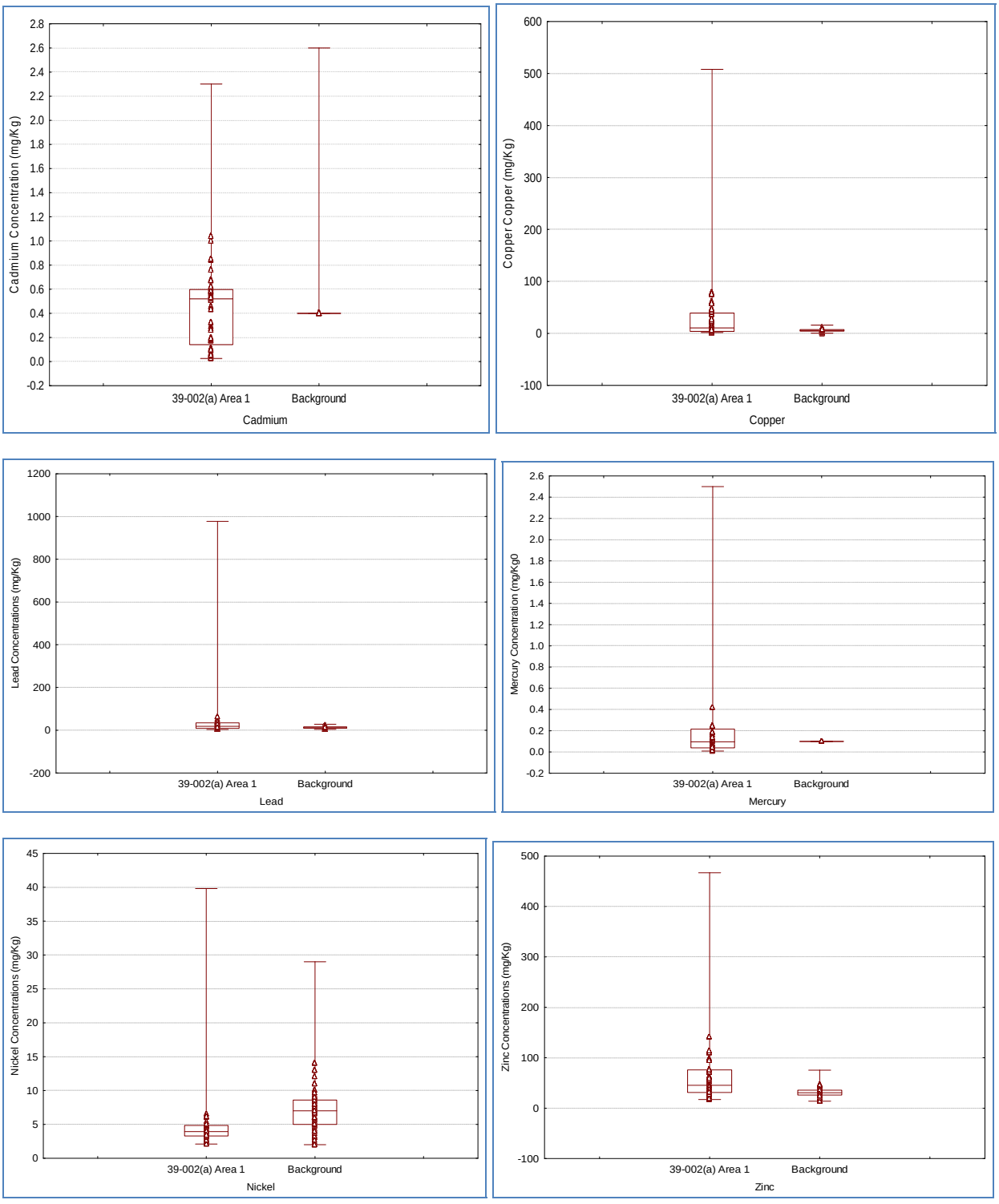

Figure B-2.1-1 Boxplots for soil COPCs at SWMU 39-002(a) Area 1 with results shown as triangles

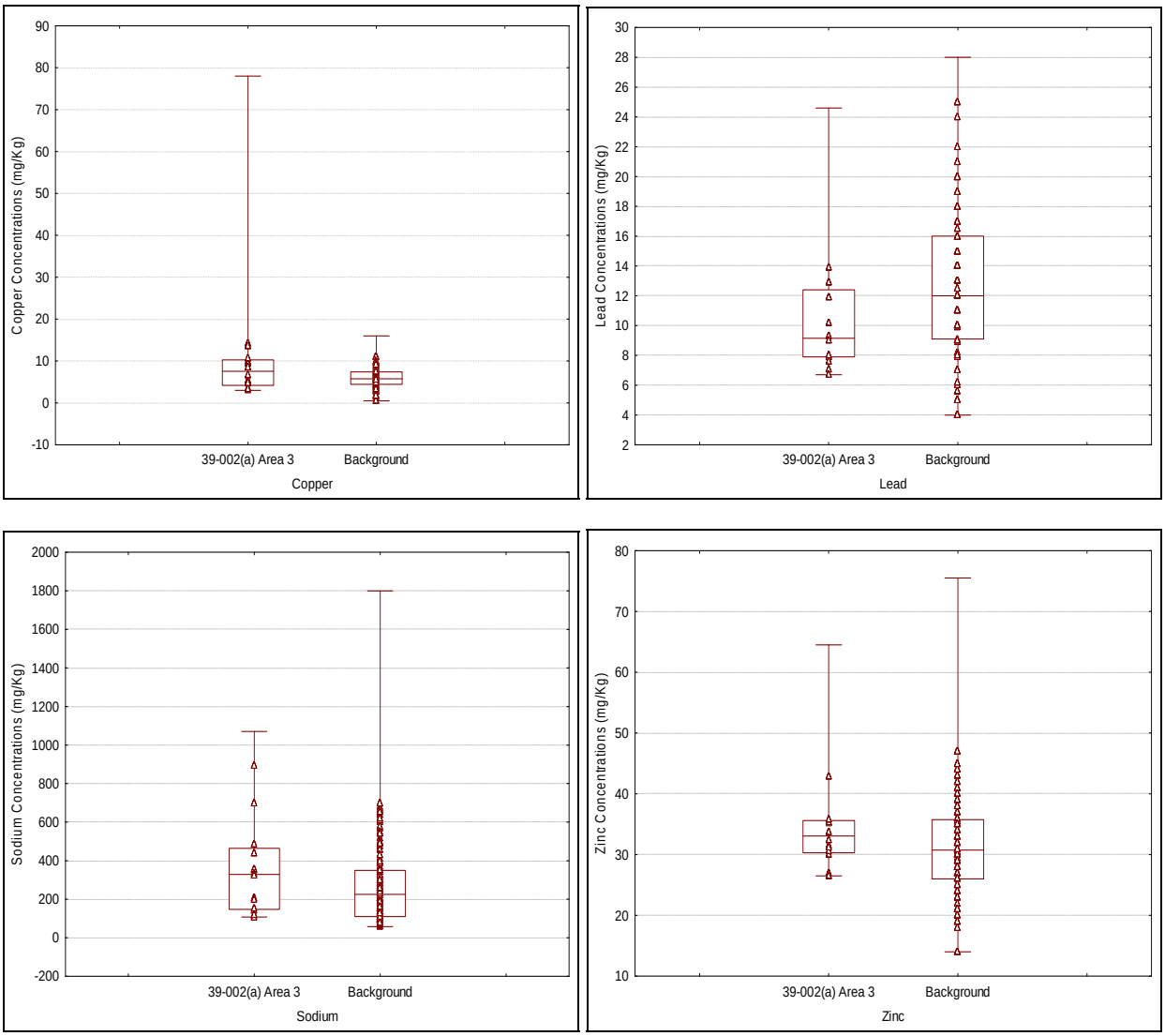

Figure B-2.3-1 Boxplots for soil COPCs at SWMU 39-002(a) Area 3

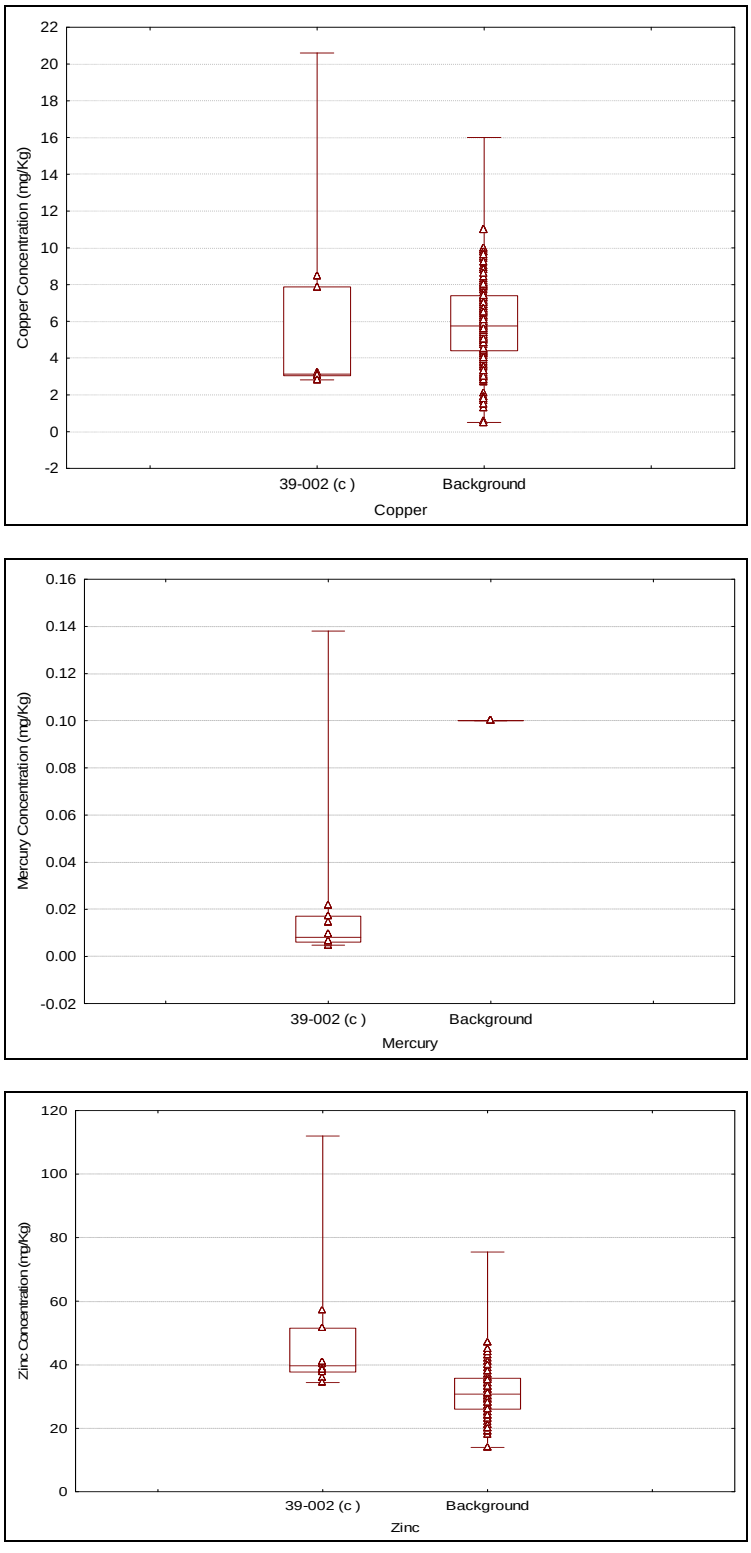

Figure B-2.5-1 Boxplots for soil COPCs at AOC 39-002(c) with results shown as triangles

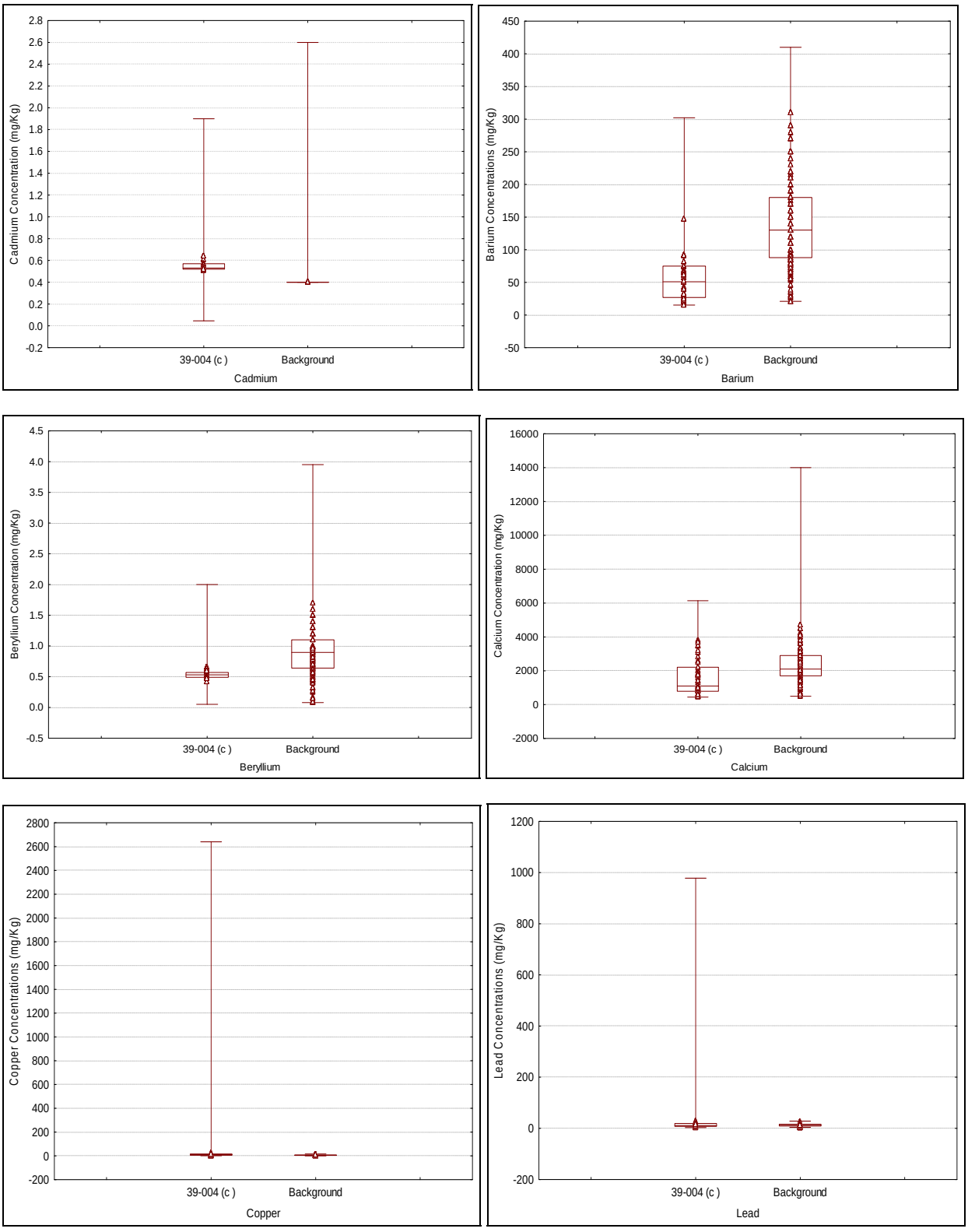

Figure B-2.7-1 Boxplots for soil COPCs at SWMU 39-004(c) with results shown as triangles

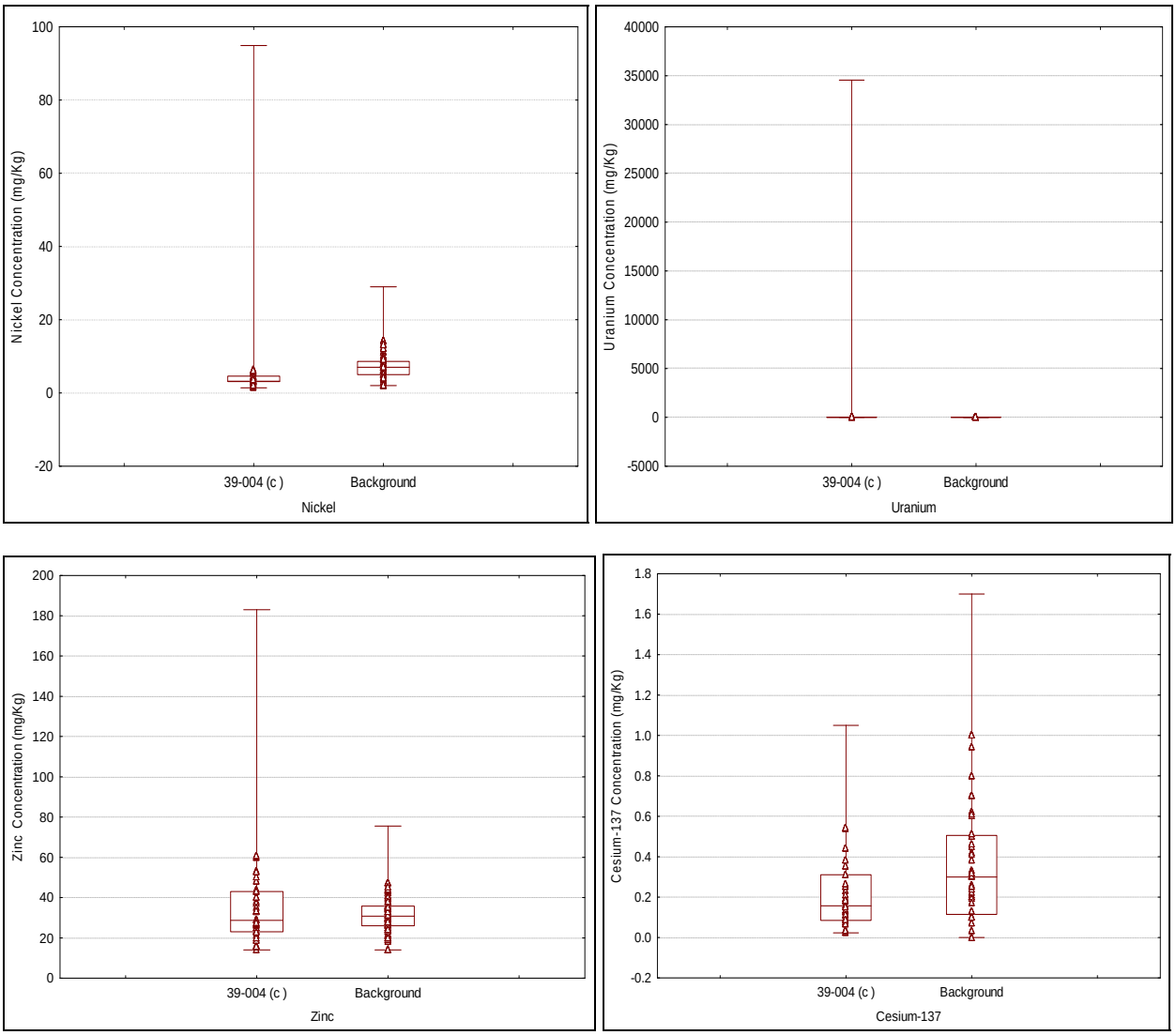

Figure B-2.7-1 (continued) Boxplots for soil COPCs at SWMU 39-004(c) with results shown as triangles

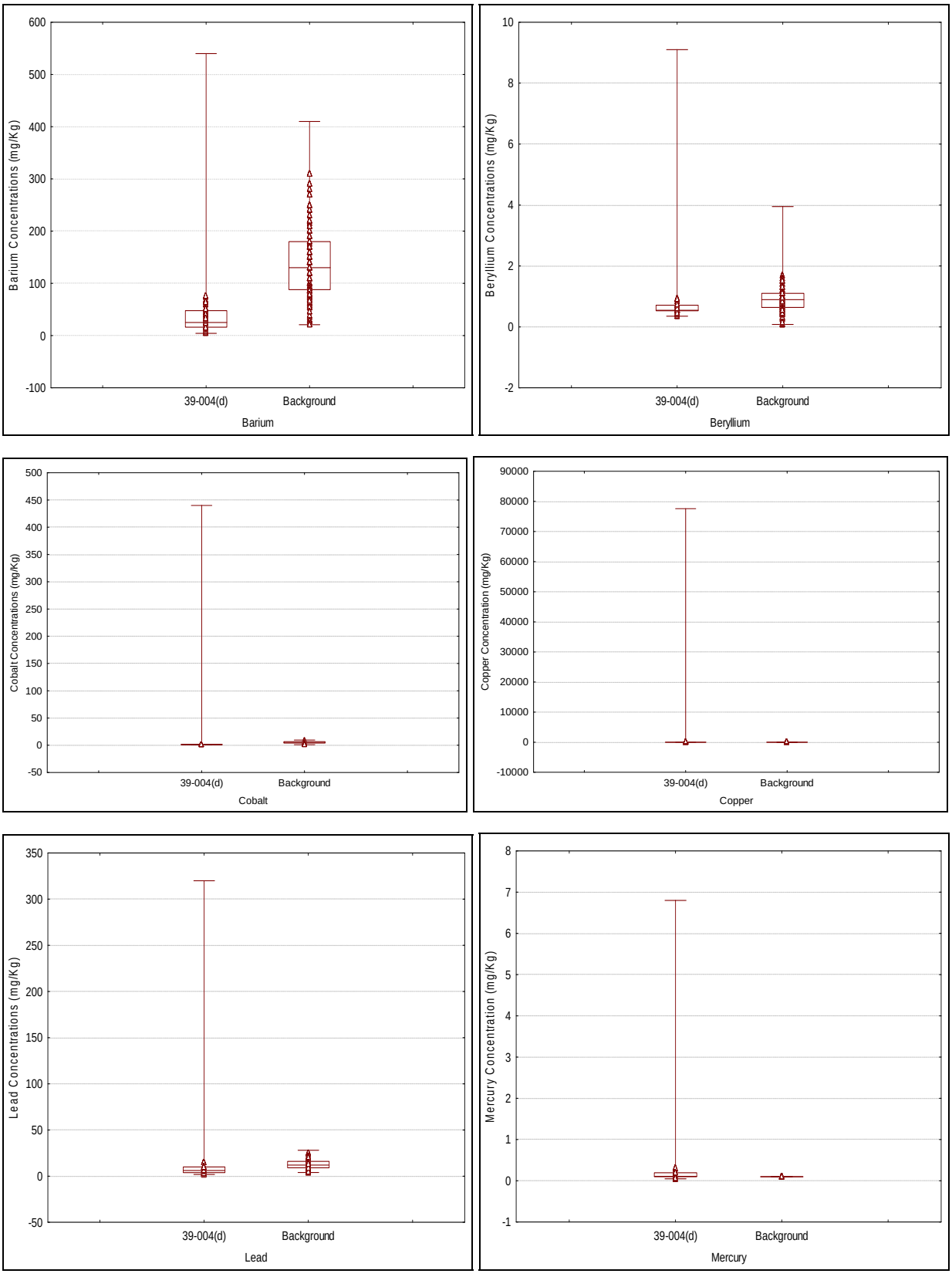

Figure B-2.8-1 Boxplots for soil COPCs at SWMU 39-004(d) with results shown as triangles

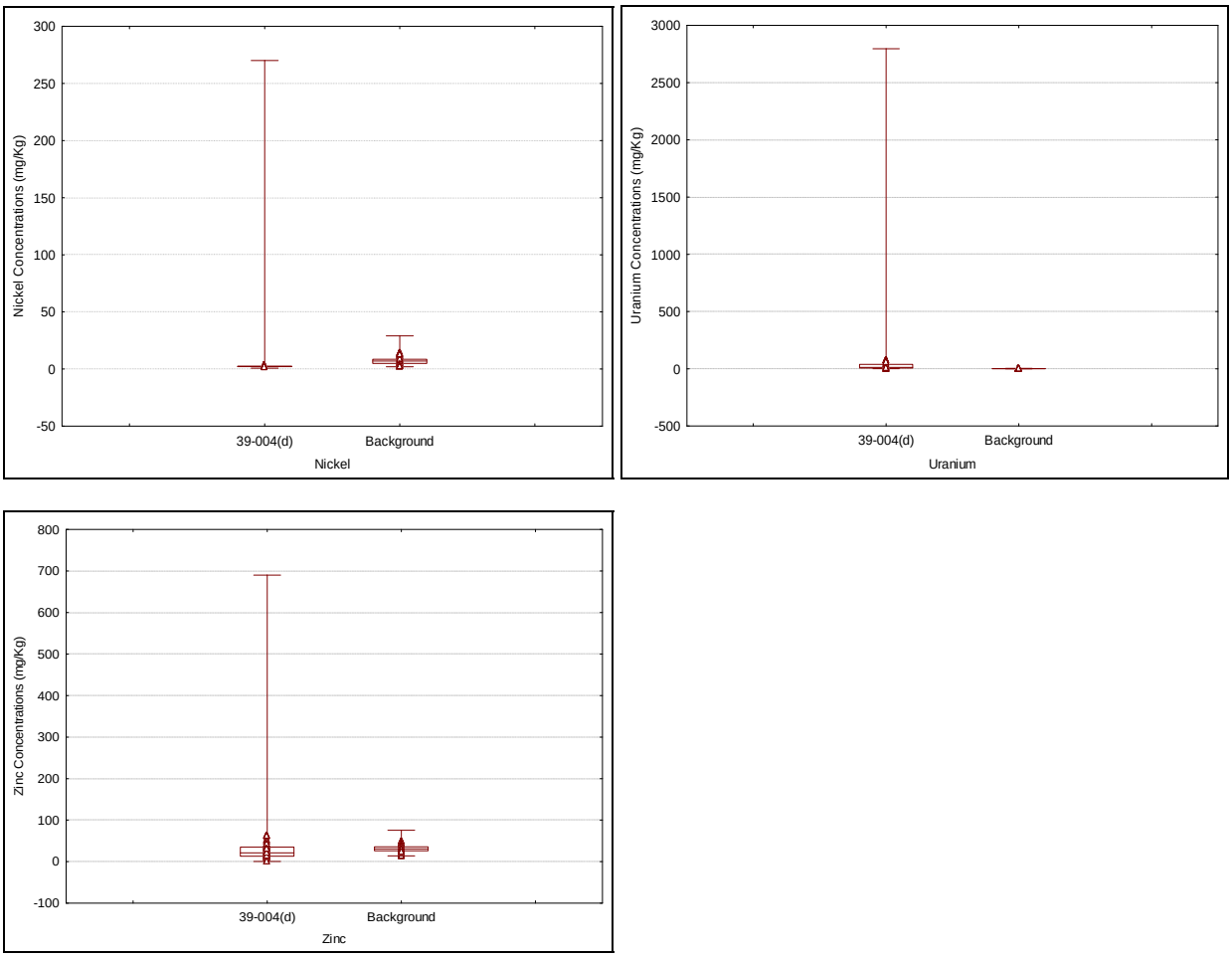

Figure B-2.8-1 (continued) Boxplots for soil COPCs at SWMU 39-004(d) with results shown as triangles

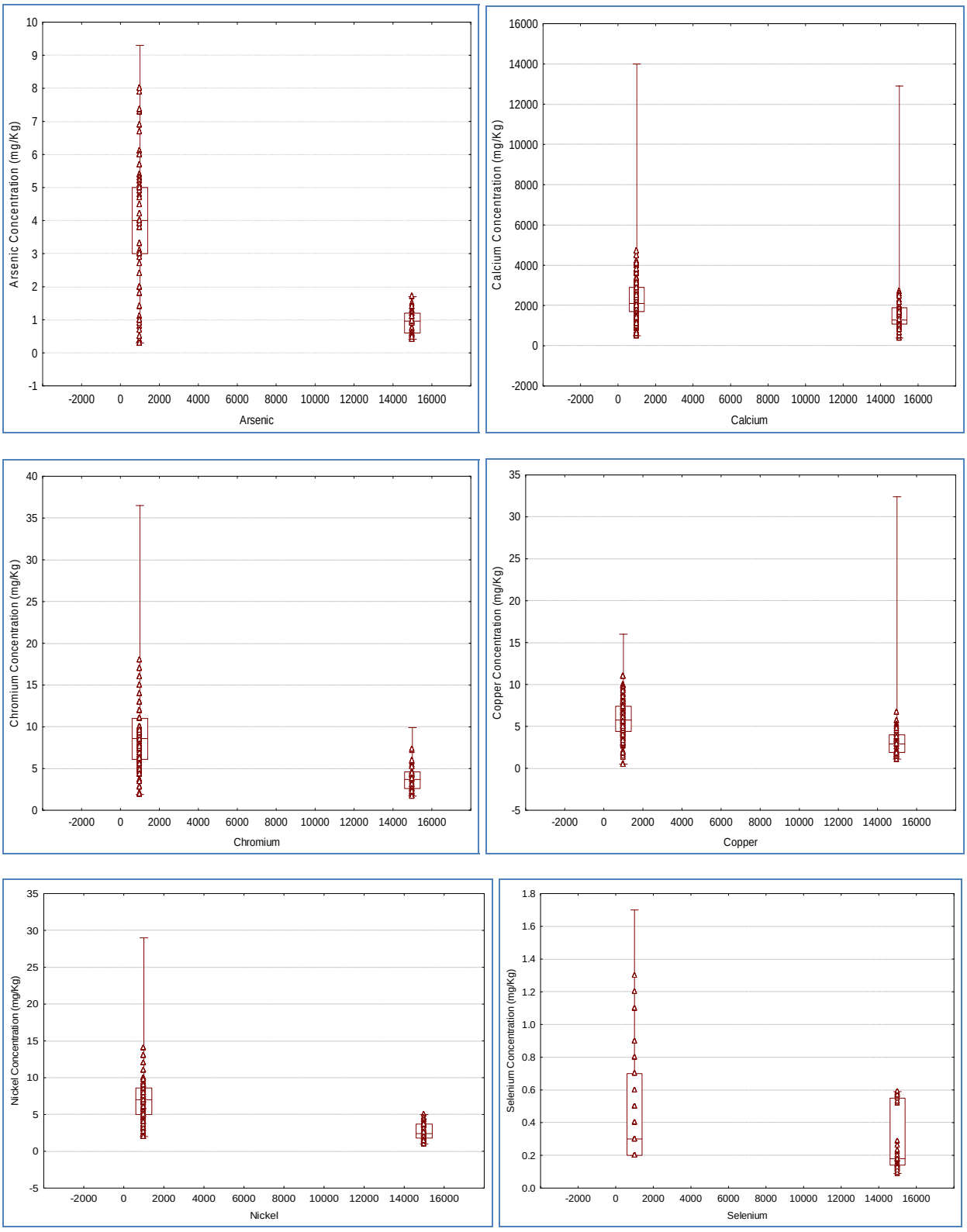

Figure B-2.9-1 Boxplots for soil COPCs at SWMU 39-005 with results shown as triangles

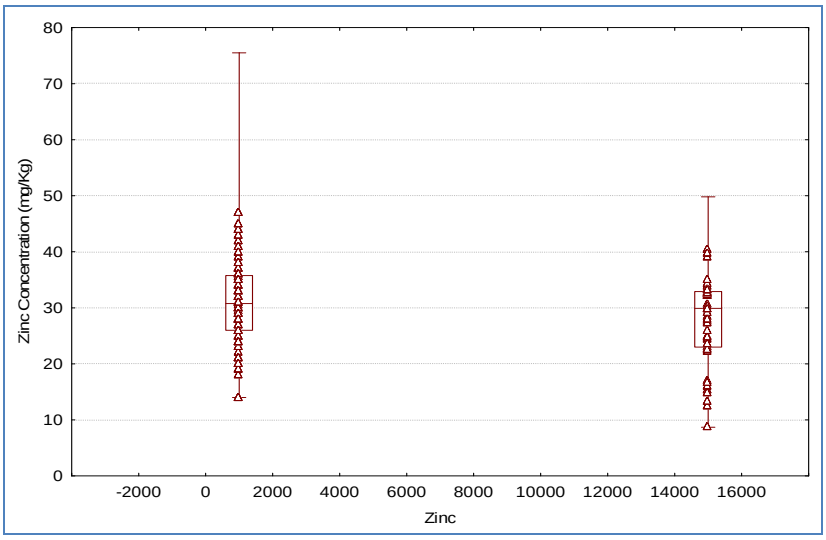

Figure B-2.9-1 (continued) Boxplots for soil COPCs at SWMU 39-005 with results shown as triangles

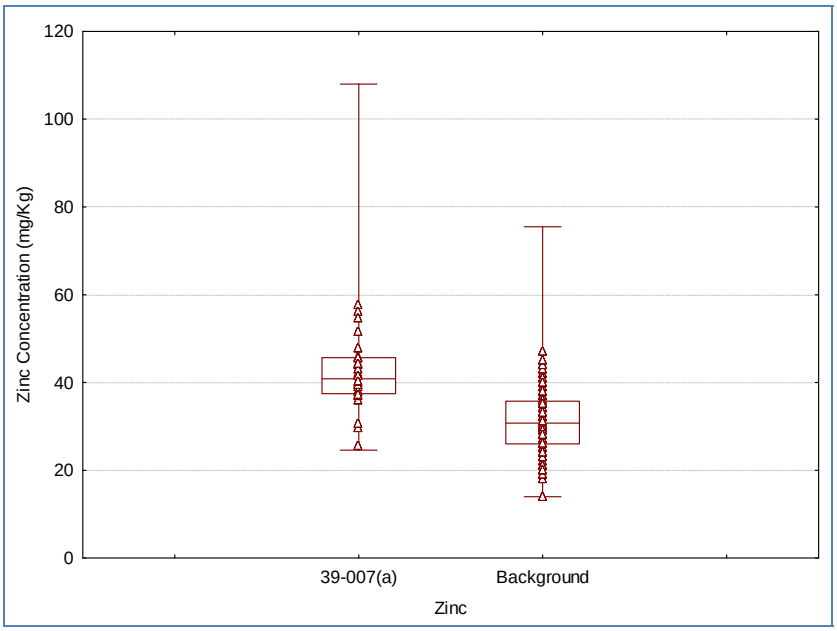

Figure B-2.11-1 Boxplot for soil COPC at SWMU 39-007(a) with results shown as triangles

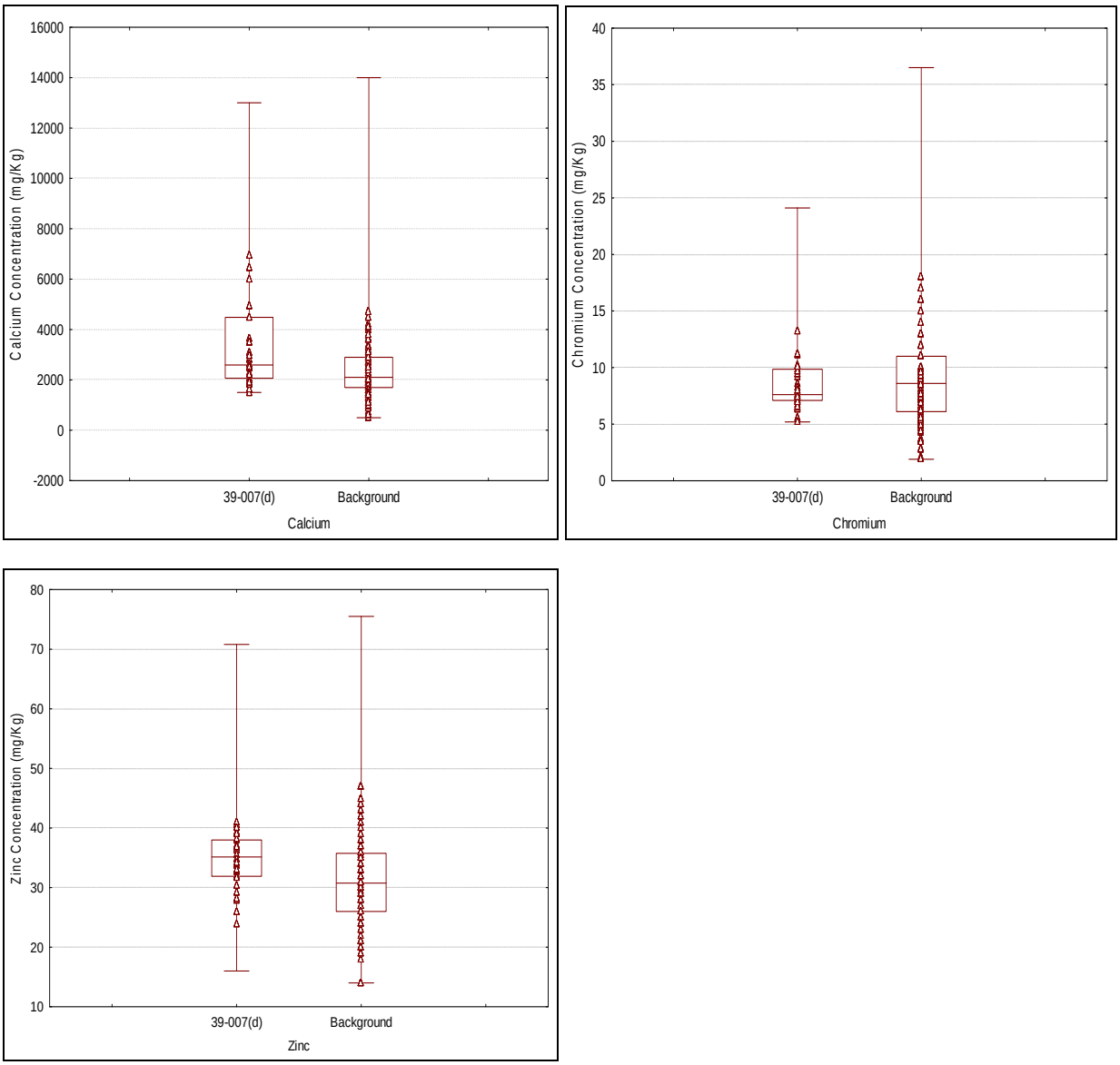

Figure B-2.12-1 Boxplots for soil COPCs at AOC 39-007(d) with results shown as triangles

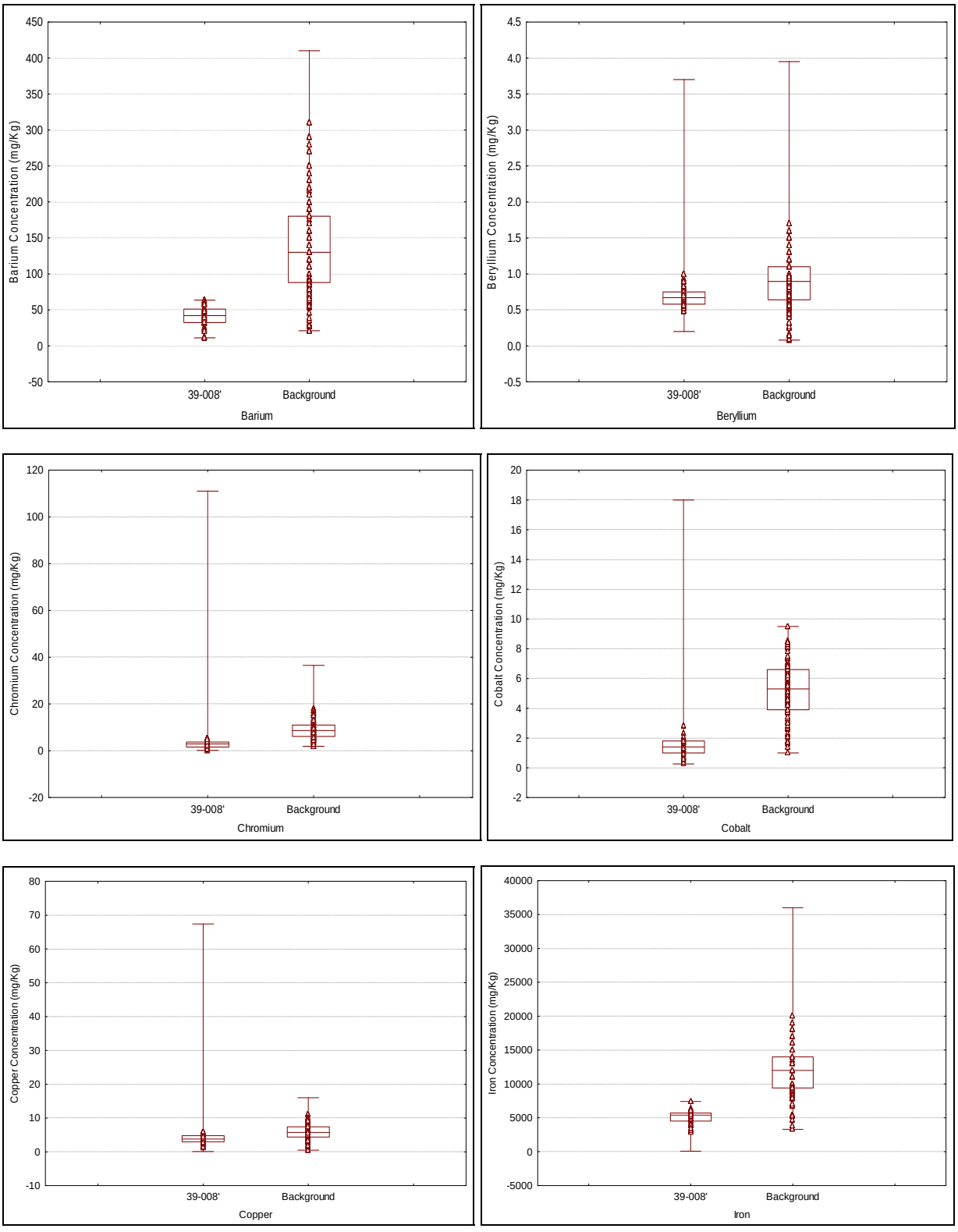

Figure B-2.13-1 Boxplots for soil COPCs at SWMU 39-008 with results shown as triangles

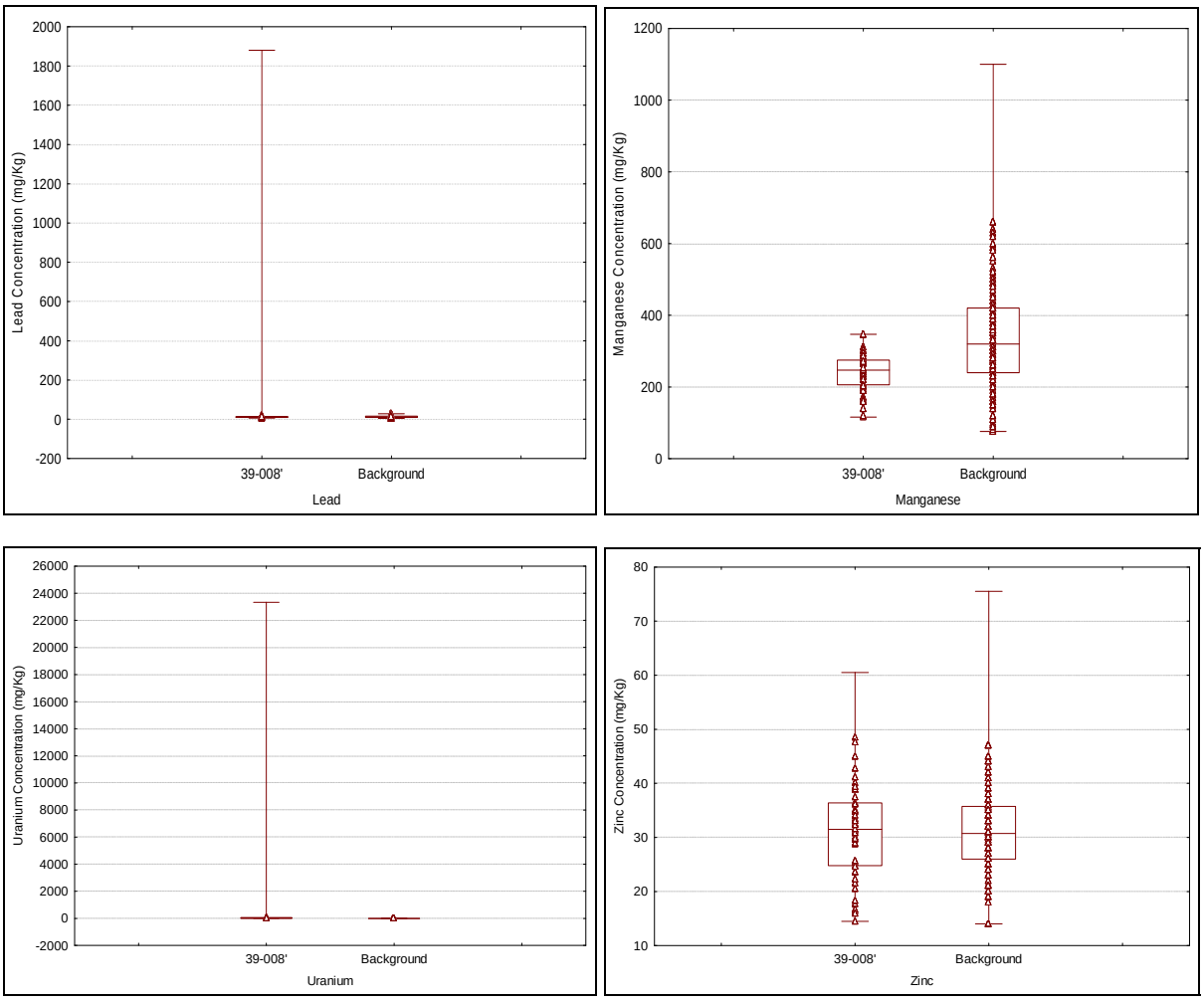

Figure B-2.13-1 (continued) Boxplots for soil COPCs at SWMU 39-008 with results shown as triangles

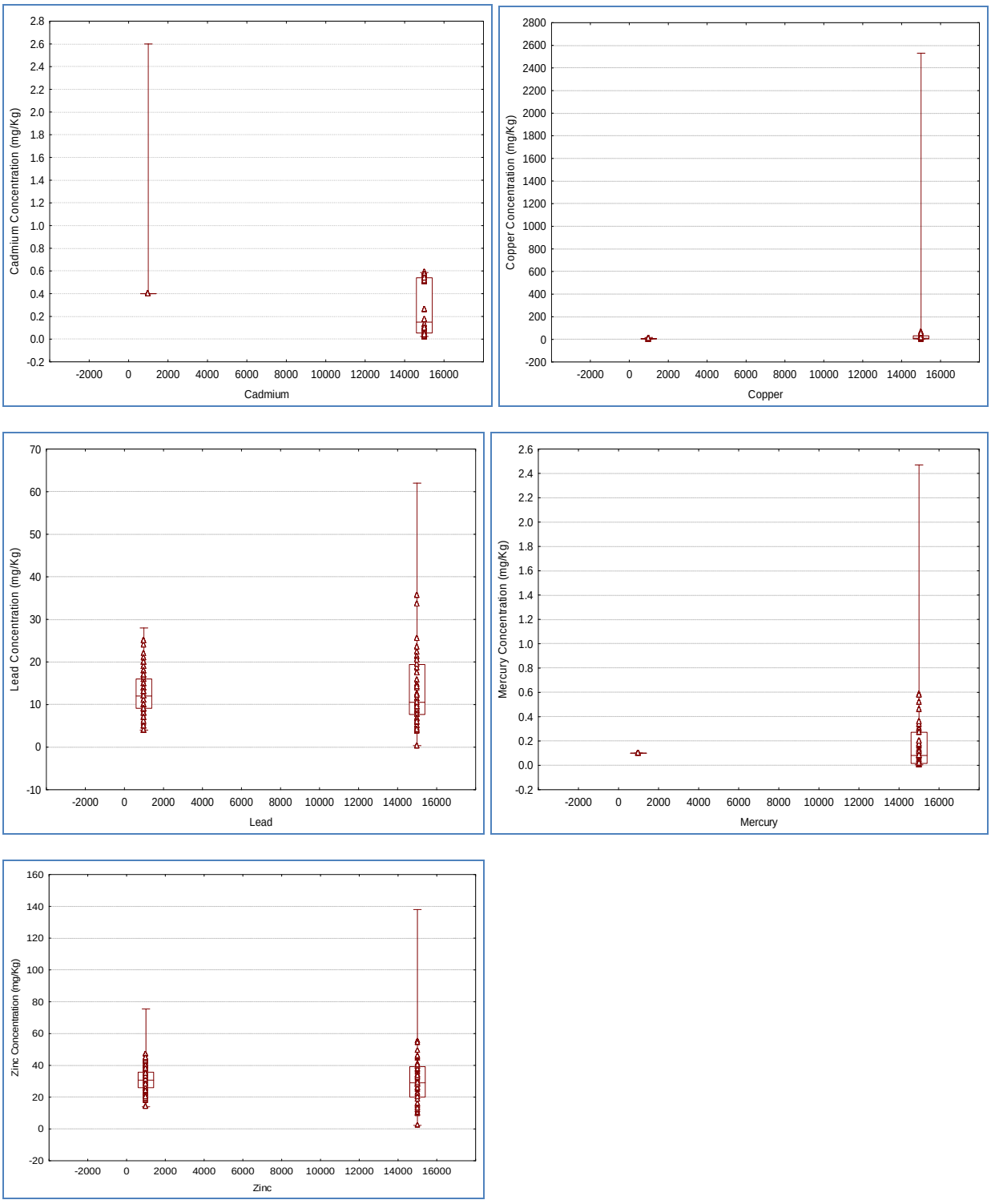

Figure B-2.14-1 Boxplots for soil COPCs at SWMU 39-010 with results shown as triangles

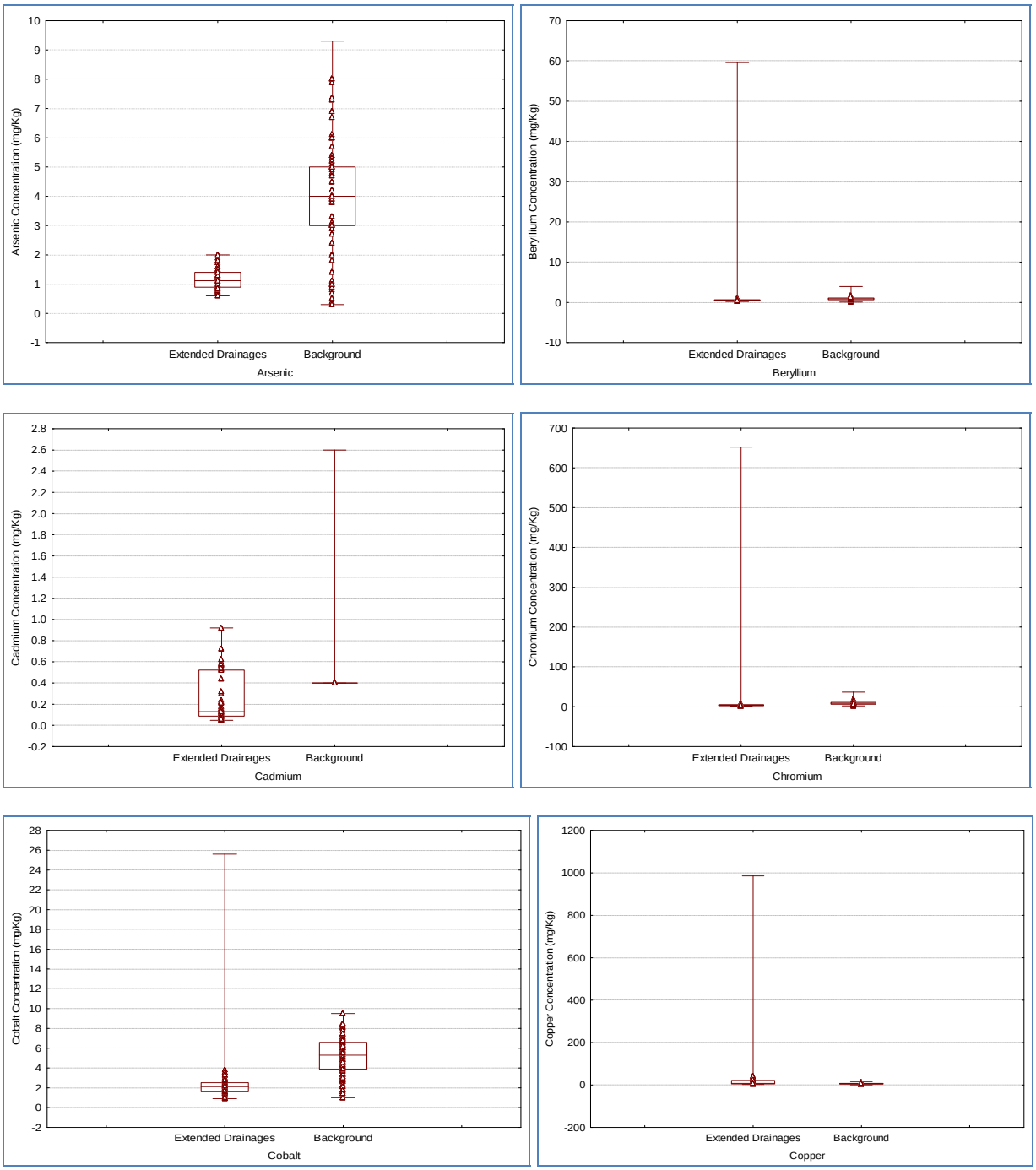

Figure B-2.15-1 Boxplots for Soil COPCs in the extended drainages with results shown as triangles

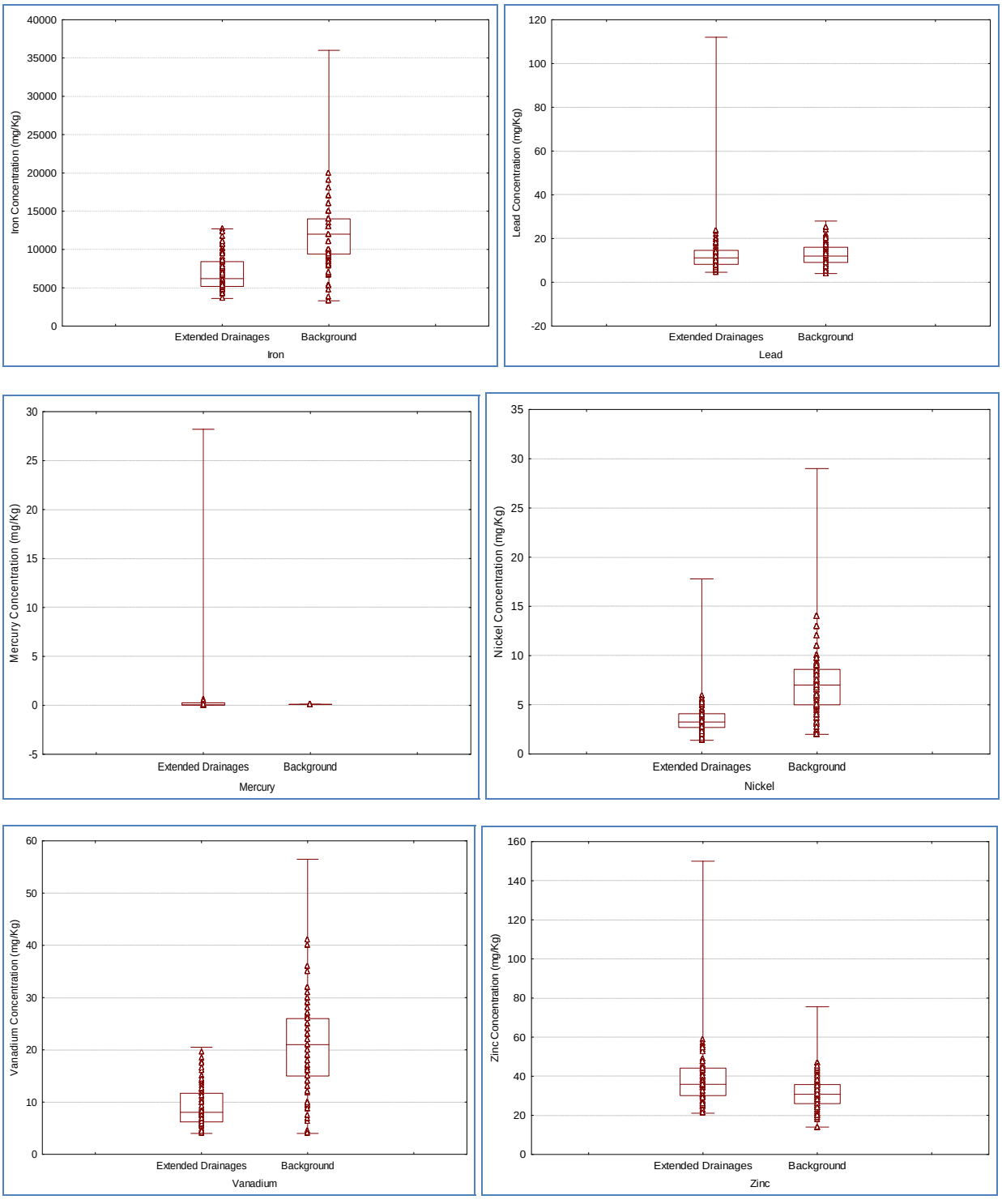

Figure B-2.15-1 (continued) Boxplots for Soil COPCs in the extended drainages with results shown as triangles

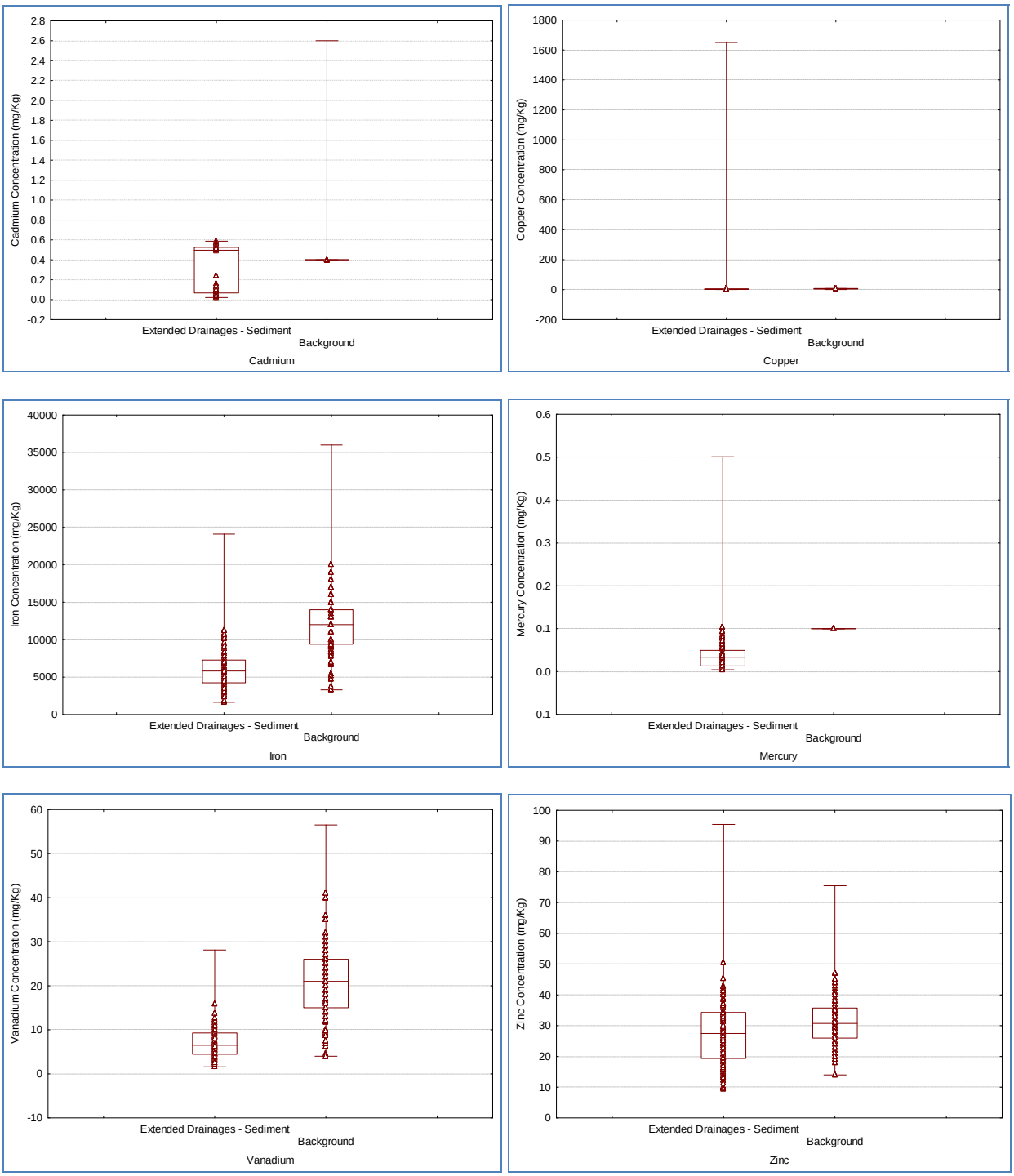

Figure B-2.15-1 (continued) Boxplots for Soil COPCs in the extended drainages with results shown as triangles

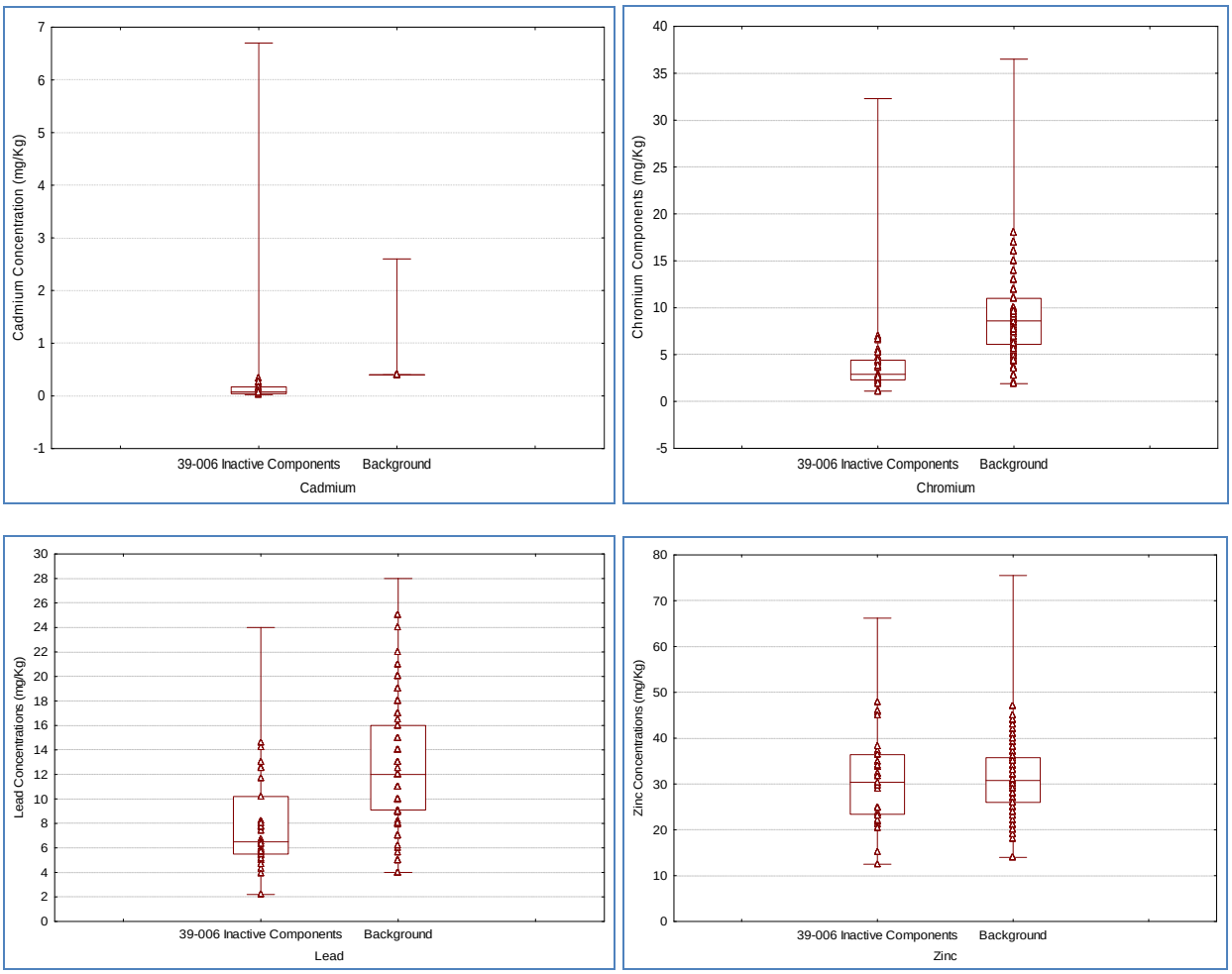

Figure B-2.18-1 Boxplots for soil COPCs at SWMU 39-006(a) inactive components with results shown as triangles

Table B-2.1-1
Statistical Analysis of Soil COPCs for SWMU 39-002(a) Area 1

Analyte	Gehan Test p-Value	Quantile Test	Retain as COPC?
Cadmium	0.0129	n/a*	Yes
Copper	<0.001	<0.05	Yes
Lead	0.00341	<0.05	Yes
Mercury	<0.001	<0.05	Yes
Nickel	>0.99	>0.05	No
Zinc	<0.001	<0.05	Yes

*n/a = Not applicable.

Table B-2.1-2
Summary of COPCs for SWMU 39-002(a) Area 1

Soil
Inorganic COPCs
Antimony
Cadmium
Copper
Cyanide
Lead
Mercury
Perchlorate
Silver
Thallium
Zinc
Organic COPCs
Acenaphthene
Acenaphthylene
Amino-2,6-dinitrotoluene[4-]
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

Table B-2.1-2 (continued)

Soil
Di-n-butylphthalate
Dibenz(a,h)anthracene
Dibenzofuran
Dichlorobenzene[1,2-]
Ethylbenzene
Fluoranthene
Fluorene
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
Hexachlorodibenzodioxin[1,2,3,4,7,8-]
Hexachlorodibenzodioxin[1,2,3,6,7,8-]
Hexachlorodibenzodioxin[1,2,3,7,8,9-]
Indeno(1,2,3-cd)pyrene
Iodomethane
Methylene chloride
Methylnaphthalene[2-]
Naphthalene
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
Phenanthrene
Pyrene
Tetryl
Toluene
TPH-DRO
Trichloroethene
Trimethylbenzene[1,2,4-]
Trinitrotoluene[2,4,6-]
Xylene[1,2-]
Xylene[1,3-]+xylene[1,4-]
Radionuclide COPCs
Plutonium-239/240
Tritium
Uranium-238

Table B-2.3-1
Statistical Analyses of Soil COPCs for SWMU 39-002(a) Area 3

Analyte	Gehan Test p-Value	Quantile Test	Retain as COPC?
Copper	0.0949	<0.05	Yes
Lead	0.99	>0.05	No
Sodium	0.0691	>0.05	No
Zinc	0.0559	>0.05	No

Table B-2.3-2
Summary of COPCs for SWMU 39-002(a) Area 3

Soil
Inorganic COPCs
Antimony
Copper
Cyanide
Organic COPCs
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
Fluoranthene
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]
Hexachlorodibenzodioxin[1,2,3,4,7,8-]
Hexachlorodibenzodioxin[1,2,3,6,7,8-]
Hexachlorodibenzodioxin[1,2,3,7,8,9-]
Hexachlorodibenzofuran[2,3,4,6,7,8-]
Indeno(1,2,3-cd)pyrene

Table B-2.3-2 (continued)

Soil
Iodomethane
Methylene chloride
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
PETN
Phenanthrene
Pyrene
Trichlorofluoromethane

Table B-2.5-1
Statistical Analyses of Soil COPCs for AOC 39-002(c)

Analyte	Gehan Test p-Value	Quantile Test	Retain as COPC?
Copper	0.958	<0.05	Yes
Mercury	0.268	n/a*	Yes
Lead	0.99	>0.05	No
Zinc	<0.001	<0.05	Yes

*n/a = Not applicable.

Table B-2.5-2
Summary of COPCs for AOC 39-002(c)

Soil
Inorganic COPCs
Antimony
Cadmium
Copper
Cyanide
Mercury
Zinc
Organic COPCs
Aroclor-1254
Benzo(a)anthracene
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]
Hexachlorodibenzodioxin[1,2,3,4,7,8-]

Table B-2.5-2 (continued)

Hexachlorodibenzodioxin[1,2,3,6,7,8-]
Hexachlorodibenzodioxin[1,2,3,7,8,9-]
Hexachlorodibenzofuran[1,2,3,4,7,8-]
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
Toluene
Xylene[1,3-]+xylene[1,4-]

Table B-2.6-1
Summary of COPCs for AOC 39-002(f)

Soil
Inorganic COPCs
Antimony
Copper
Perchlorate
Organic COPCs
Benzo(a)pyrene
Benzo(b) fluoranthene
Benzo(g,h,i)perylene
Chrysene
Fluoranthene
indeno(1,2,3-cd)pyrene
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
Phenanthrene
Pyrene
Toluene

Table B-2.7-1
Statistical Analyses of Soil COPCs for SWMU 39-004(c)

Analyte	Gehan Test p-Value	Quantile Test	Retain as COPC?
Chromium	>0.99	>0.05	No
Cobalt	>0.99	>0.05	No
Copper	<0.001	<0.05	Yes
Lead	0.638	>0.05	No
Nickel	>0.99	>0.05	No
Uranium	<0.001	<0.05	Yes
Zinc	0.69	<0.05	Yes
Barium	>0.99	>0.05	No
Beryllium	>0.99	>0.05	No
Cadmium	0.719	n/a*	Yes
Calcium	>0.99	>0.05	No

*n/a = Not applicable.

Table B-2.7-2
Summary of COPCs for SWMU 39-004(c)

Soil	Sediment
Inorganic COPCs	
Antimony	Selenium
Cadmium	
Copper	
Cyanide	
Mercury	
Silver	
Thallium	
Uranium	
Zinc	
Radionuclide COPCs	
Plutonium-238	None
Plutonium-239/240	
Sodium-22	
Thorium-228	
Thorium-230	
Thorium-232	
Uranium-234	
Uranium-235/236	
Uranium-238	

Table B-2.7-2 (continued)

Soil	Sediment
Organic COPCs	
Aroclor-1248	None
Aroclor-1254	
Aroclor-1260	
Benzoic Acid	
Bis(2-chloroethyl)ether	
Bis(2-ethylhexyl)phthalate	
Butylbenzylphthalate	
Di-n-butylphthalate	
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	
Hexachlorodibenzofuran[1,2,3,4,7,8-]	
Hexachlorodibenzofuran[1,2,3,6,7,8-]	
Naphthalene	
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	
Pentachlorodibenzofuran[2,3,4,7,8-]	
RDX	

Table B-2.8-1
Statistical Analyses of Soil COPCs for SWMU 39-004(d) Firing Site

Analyte	Gehan Test p-Value	Quantile Test	Retain as COPC?
Barium	>0.99	>0.05	No
Beryllium	>0.99	<0.05	Yes
Cobalt	>0.99	>0.05	No
Copper	0.851	<0.05	Yes
Lead	>0.99	<0.05	Yes
Mercury	<0.001	<0.05	Yes
Nickel	>0.99	>0.05	No
Uranium	<0.001	<0.05	Yes
Zinc	>0.99	>0.05	No

Table B-2.8-2
Summary of COPCs for SWMU 39-004(d) Firing Site

Soil	Qbo
Inorganic COPCs	
Antimony	Antimony
Beryllium	Arsenic
Cadmium	Barium
Copper	Beryllium
Cyanide	Cadmium
Lead	Chromium
Mercury	Copper
Perchlorate	Iron
Silver	Lead
Thallium	Manganese
Uranium	Mercury
	Selenium
Organic COPCs	
Amino-2,6-dinitrotoluene[4-]	Amino-2,6-dinitrotoluene[4-]
Amino-4,6-dinitrotoluene[2-]	Aroclor-1260
Anthracene	HMX
Aroclor-1260	RDX
Bis(2-ethylhexyl)phthalate	TATB
Chrysene	
Di-n-butylphthalate	
HMX	
PETN	
RDX	
TATB	
Radionuclide COPCs	
Europium-152	Uranium-234
Sodium-22	Uranium-235/236
Thorium-228	Uranium-238
Thorium-230	
Thorium-232	
Uranium-234	
Uranium-235	
Uranium-235/236	
Uranium-238	

Table B-2.9-1
Statistical Analyses of Soil COPCs for SWMU 39-005

Analyte	Gehan Test p-Value	Quantile Test	Retain as COPC?
Calcium	>0.99	>0.05	No
Zinc	0.964	>0.05	No

Table B-2.9-2
Summary of COPCs for SWMU 39-005

Soil	Qbo
Inorganic COPCs	
Cyanide	Arsenic
Mercury	Chromium
	Copper
	Nickel
	Selenium
Organic COPCs	
Dinitroaniline[3,5-]	Acenaphthene
Acenaphthene	Acetone
Acetone	Anthracene
Amino-2,6-dinitrotoluene[4-]	Aroclor-1254
Amino-4,6-dinitrotoluene[2-]	Benzo(a)anthracene
Anthracene	Benzo(a)pyrene
Benzo(a)anthracene	Benzo(b)fluoranthene
Benzo(a)pyrene	Benzo(g,h,i)perylene
Benzo(b)fluoranthene	Benzo(k)fluoranthene
Benzo(g,h,i)perylene	Chrysene
Benzo(k)fluoranthene	Dibenzofuran
Bromomethane	Fluoranthene
Chrysene	Fluorene
Dibenzofuran	Indeno(1,2,3-cd)pyrene
Fluoranthene	Methylene Chloride
Fluorene	Naphthalene
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Phenanthrene
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Pyrene
Hexanone[2-]	
Indeno(1,2,3-cd)pyrene	
Isopropyltoluene[4-]	

Table B-2.9-2 (continued)

Soil	Qbo
Methylene Chloride	
Methylnaphthalene[2-]	
Naphthalene	
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	
Phenanthrene	
Pyrene	
RDX	
Tetrachlorodibenzodioxin[2,3,7,8-]	
Trinitrobenzene[1,3,5-]	
Trinitrotoluene[2,4,6-]	
Radionuclide COPCs	
Plutonium-238	Plutonium-238
Tritium	Uranium-235/236
Uranium-234	
Uranium-235/236	
Uranium-238	

Table B-2.10-1
Summary of COPCs for
SWMU 39-006(a) Septic System Active Components

Soil
Inorganic COPCs
Mercury
Organic COPCs
Amino-2,6-dinitrotoluene[4-]
Bis(2-ethylhexyl)phthalate
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
Octachlordibenzodioxin [1,2,3,4,6,7,8,9-]
Octachlordibenzofuran [1,2,3,4,6,7,8,9-]

Table B-2.11-1
Statistical Analyses of Soil COPCs for SWMU 39-007(a)

Analyte	Gehan Test p-Value	Quantile Test	Retain as COPC?
Zinc	>0.99	>0.05	No

Table B-2.11-2
Summary of COPCs for SWMU 39-007(a)

Soil/Fill
Inorganic COPCs
Antimony
Cadmium
Cyanide
Perchlorate
Organic COPCs
Acetone
Aroclor-1242
Aroclor-1248
Aroclor-1254
Aroclor-1260
Benzo(k)fluoranthene
Bis(2-ethylhexy)phthalate
Butylbenzylphthalate
Chrysene
Dichlorobenzene[1,4-]
Ethylbenzene
Fluoranthene
Isopropylbenzene
Isopropyltoluene[4-]
Phenanthrene
Pyrene
Toluene

Table B-2.12-1
Statistical Analyses of Soil COPCs for AOC 39-007(d)

Analyte	Gehan Test p-Value	Quantile Test	Retain as COPC?
Chromium	0.481	>0.05	No
Zinc	<0.001	>0.05	Yes
Cesium-137	>0.05	>0.05	No

Table B-2.12-2
Summary of COPCs for AOC 39-007(d)

Soil
Inorganic COPCs
Antimony
Cadmium
Cyanide
Perchlorate
Zinc
Organic COPCs
Acetone
Anthracene
Aroclor-1242
Aroclor-1254
Benzo(a)pyrene
Bis(2-ethylhexyl)phthalate
Bromomethane
Diphenylamine
Fluorene
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]
Hexachlorodibenzodioxin[1,2,3,4,7,8-]
Hexachlorodibenzodioxin[1,2,3,6,7,8-]
Hexachlorodibenzodioxin[1,2,3,7,8,9-]
Hexachlorodibenzofuran[1,2,3,4,7,8-]
Hexachlorodibenzofuran[1,2,3,6,7,8-]
Hexachlorodibenzofuran[2,3,4,6,7,8-]
Isopropyltoluene[4-]
Methylene Chloride
Methylnaphthalene[2-]
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
Pentachlorodibenzofuran[1,2,3,7,8-]
Pentachlorodibenzofuran[2,3,4,7,8-]
Phenanthrene
Pyrene
Tetrachlorodibenzodioxin[2,3,7,8-]
Toluene
Trichlorofluoromethane
Trimethylbenzene[1,2,4-]
Trimethylbenzene[1,3,5-]
Radionuclide COPCs
Plutonium-239/240
Tritium

Table B-2.13-1
Statistical Analyses of Soil COPCs for SWMU 39-008

Analyte	Gehan Test p-Value	Quantile Test	Retain as COPC?
Beryllium	>0.99	>0.05	No
Chromium	>0.99	n/a*	Yes
Cobalt	>0.99	>0.05	No
Copper	>0.99	>0.05	No
Uranium	<0.001	<0.05	Yes
Zinc	0.422	>0.05	No

*n/a = Not applicable.

Table B-2.13-2
Summary of COPCs for SWMU 39-008

Soil	Qbo
Inorganic COPCs	
Antimony	Selenium
Cadmium	Barium
Cyanide	Chromium
Chromium	Iron
Lead	Manganese
Mercury	Nickel
Selenium	Zinc
Silver	
Thallium	
Uranium	
Organic COPCs	
Aroclor-1254	Bis(2-ethylhexyl)phthalate
Aroclor-1260	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]
Benzo(a)anthracene	Hexachlorodibenzofuran[1,2,3,6,7,8-]
Benzo(b)fluoranthene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
Benzo(g,h,i)perylene	
Benzo(k)fluoranthene	
Benzyl Alcohol	
Bis(2-ethylhexyl)phthalate	
Chrysene	
Di-n-butylphthalate	
Dichloroethane[1,2-]	
Fluoranthene	

Table B-2.13-2 (continued)

Soil	Qbo
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	
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-]	
Isopropyltoluene[4-]	
Methylene Chloride	
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	
Pentachlorodibenzodioxin[1,2,3,7,8-]	
Pentachlorodibenzofuran[1,2,3,7,8-]	
Pentachlorodibenzofuran[2,3,4,7,8-]	
Phenanthrene	
Pyrene	
Tetrachlorodibenzodioxin[2,3,7,8-]	
Trichlorofluoromethane	
Trimethylbenzene[1,3,5-]	
Tris (o-cresyl) phosphate	
Radionuclide COPCs	
Americium-241	None
Cesium-137	
Plutonium-239/240	
Thorium-228	
Thorium-230	
Thorium-232	
Tritium	
Uranium-235	
Uranium-235/236	
Uranium-238	

Table B-2.14-1
Statistical Analyses of Soil COPCs for SWMU 39-010

Analyte	Gehan Test p-Value	Quantile Test	Retain as COPC?
Beryllium	>0.99	>0.05	No
Cadmium	0.893	n/a*	Yes
Copper	<0.001	<0.05	Yes
Lead	0.895	<0.05	Yes
Mercury	<0.001	<0.05	Yes
Zinc	0.938	>0.05	No

*n/a = Not applicable.

Table B-2.14-2
Summary of COPCs by Media Type for SWMU 39-010

Soil	Sediment	Qbo
Inorganic COPCs		
Antimony	Antimony	Copper
Copper	Cadmium	Lead
Lead	Perchlorate	Mercury
Mercury	Selenium	Perchlorate
Perchlorate		Antimony
Cadmium		Nickel
		Vanadium
		Zinc
		Aluminum
		Cadmium
		Arsenic
		Barium
		Chromium
		Iron
		Magnesium
		Manganese
Organic COPCs		
Amino-2,6-dinitrotoluene[4-]	None	Aroclor-1254
Amino-4,6-dinitrotoluene[2-]		Aroclor-1260
Aroclor-1254		Butylbenzylphthalate
Aroclor-1260		Di-n-butylphthalate
Benzo(a)anthracene		HMX
Benzo(a)pyrene		RDX
Benzo(b)fluoranthene		Trinitrotoluene[2,4,6-]

Table B-2.14-2 (continued)

Soil	Sediment	Qbo
Benzo(g,h,i)perylene		
Benzo(k)fluoranthene		
Bis(2-ethylhexyl)phthalate		
Chloromethane		
Chrysene		
Di-n-butylphthalate		
Fluoranthene		
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]		
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]		
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]		
Hexachlorodibenzodioxin[1,2,3,4,7,8-]		
Hexachlorodibenzodioxin[1,2,3,6,7,8-]		
Hexachlorodibenzodioxin[1,2,3,7,8,9-]		
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-]		
Hexanone[2-]		
HMX		
Indeno(1,2,3-cd)pyrene		
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]		
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]		
Pentachlorodibenzofuran[1,2,3,7,8-]		
Pentachlorodibenzofuran[2,3,4,7,8-]		
Phenanthrene		
Pyrene		
RDX		
Trimethylbenzene[1,3,5-]		
Trinitrotoluene[2,4,6-]		
Radionuclides		
Cesium-137		Tritium
Tritium		Uranium-234
Uranium-234		Uranium-235/236
Uranium-235/236		Uranium-238
Uranium-238		

Table B-2.15-1
Statistical Analyses of COPCs for the Extended Drainages

Analyte	Soil COPCs			Sediment COPCs		
	Gehan Test p-Value	Quantile Test	Retain as COPC?	Gehan Test p-Value	Quantile Test	Retain as COPC?
Beryllium	>0.99	>0.05	No	—[a]	—	—
Cadmium	0.822	n/a[b]	Yes	0.994	n/a	Yes
Chromium	>0.99	>0.05	No	—	—	—
Cobalt	>0.99	>0.05	No	—	—	—
Copper	<0.001	<0.05	Yes	>0.99	>0.05	No
Iron	—	—	—	>0.99	>0.05	No
Lead	>0.99	<0.05	Yes	—	—	—
Mercury	<0.001	<0.05	Yes	0.204	<0.05	Yes
Nickel	>0.99	>0.05	No	—	—	—
Vanadium	—	—	—	>0.99	>0.05	No
Zinc	<0.001	<0.05	Yes	>0.99	>0.05	No

[a] — = Not a COPC in this medium.

[b] n/a = Not applicable.

Table B-2.15-2
Summary of COPCs by Media Type for the Extended Drainages

Soil	Qbo	Sediment
Inorganic COPCs		
Antimony	Antimony	Antimony
Cadmium	Arsenic	Cadmium
Copper	Copper	Mercury
Cyanide	Cyanide	Perchlorate
Lead		Selenium
Mercury		
Perchlorate		
Zinc		
Organic COPCs		
Acenaphthene	Bis(2-ethylhexyl)phthalate	Acetone
Acetone	PETN	Aroclor-1242
Anthracene		Aroclor-1254
Aroclor-1242		Benzo(a)pyrene
Aroclor-1254		Benzo(b)fluoranthene
Aroclor-1260		Benzo(g,h,i)perylene
Benzo(a)anthracene		Bis(2-ethylhexyl)phthalate
Benzo(a)pyrene		Bromomethane

Table B-2.15-2 (continued)

Soil	Qbo	Sediment
Benzo(b)fluoranthene		Butylbenzylphthalate
Benzo(g,h,i)perylene		Chloromethane
Benzo(k)fluoranthene		Dinitrotoluene[2,4-]
Bis(2-ethylhexyl)phthalate		Fluoranthene
Butylbenzylphthalate		Iodomethane
Chloromethane		Isopropyltoluene[4-]
Chrysene		Methylene chloride
Di-n-butylphthalate		4-nitrotoluene
Dibenz(a,h)anthracene		Pyrene
Dichlorobenzene[1,2-]		TATB
Dichlorobenzene[1,4-]		Toluene
Fluoranthene		Trichlorofluoromethane
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]		Trimethylbenzene[1,2,4-]
HMX		Trinitrotoluene[2,4,6-]
Indeno(1,2,3-cd)pyrene		
Iodomethane		
4-isopropyltoluene		
Methylene chloride		
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]		
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]		
Phenanthrene		
Pyrene		
RDX		
Styrene		
TATB		
Toluene		
Trichlorofluoromethane		
Trimethylbenzene[1,2,4-]		
Radionuclide COPCs		
Tritium	None	Uranium-234
Uranium-234		Uranium-235/236
Uranium-235/236		Uranium-238
Uranium-238		Tritium

Table B-2.16-1
Summary of COPCs for SWMU 39-001(a)

Soil and Fill
Inorganic COPCs
Antimony
Cadmium
Cyanide
Mercury
Uranium
Perchlorate
Silver
Organic COPCs
Aroclor-1242
Aroclor-1254
Aroclor-1260
Benzo(g,h,i)perylene
Bis(2-ethylhexyl)phthalate
DDE[4,4'-]
DDT[4,4'-]
Di-n-butylphthalate
Di-n-octylphthalate
Dibenz(a,h)anthracene
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
HMX
Indeno(1,2,3-cd)pyrene
Iodomethane
Methoxychlor[4,4'-]
Methylene Chloride
Nitroglycerin
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
RDX
Radionuclide COPCs
Cesium-134
Europium-152
Tritium
Uranium-238

Table B-2.17-1
Summary of COPCs for SWMU 39-001(b)

Soil
Inorganic COPCs
Cyanide
Lead
Mercury
Perchlorate
Vanadium
Zinc
Organic COPCs
Acenaphthene
Aroclor-1254
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
Bis(2-ethylhexyl)phthalate
Chrysene
Fluoranthene
HMX
Indeno(1,2,3-cd)pyrene
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
Phenanthrene
Pyrene
RDX
Toluene
Trimethylbenzene[1,2,4-]
Radionuclide COPCs
Tritium

Table B-2.18-1
Statistical Analyses of COPCs for SWMU 39-006(a) Inactive Components

Analyte	Gehan Test p-Value	Quantile Test	Retain as COPC?
Cadmium	0.243	n/a*	Yes
Chromium	>0.99	>0.05	No
Lead	>0.99	>0.05	No
Zinc	0.587	>0.05	No

*n/a = Not applicable.

Table B-2.18-2
Summary of COPCs for
SWMU 39-006(a) Inactive Components

Soil and Fill
Inorganic COPCs
Cadmium
Cyanide
Nitrate
Perchlorate
Silver
Radionuclide COPCs
Cesium-137
Tritium
Organic COPCs
Acetone
Aroclor-1254
Benzene
Bis(2-ethylhexyl)phthalate
Di-n-butylphthalate
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]
Iodomethane
Isopropyltoluene[4-]
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
Phenol
Toluene
Trimethylbenzene[1,2,4-]

Attachment B-1

ProUCL Files for Background
(on CD included with this document)

Appendix C

Field Methods

C-1.0 INTRODUCTION

This appendix describes field methods used during investigations and excavations at North Ancho Canyon Aggregate Area, including Solid Waste Management Units (SWMUs) 39-004(d), 39-010, 39-001(b), 39-008, 39-004(c), 39-007(a), 39-007(d), 39-005, 39-001(a), 39-002(a), and 39-006(a); Areas of Concern (AOCs) 39-002(f), 39-002(c), and 39-002(b); and the extended drainages. The methods used are summarized in Table C-1.0-1. Characterization and remediation activities were conducted from February to August 2009 in accordance with the most current versions of applicable Portage standard operating procedures (SOPs) and quality procedures (QPs). Work was performed in accordance to the Portage SOPs per section 2.1.1.4 of "Exhibit D," Scope of Work and Technical Specifications in the December 2007 Investigation Work Plan for North Ancho Canyon Aggregate Area. The field activities conducted at the North Ancho Canyon Aggregate Area are described in the approved investigation work plan (LANL 2007, 098280) and include the following:

- Conducting geodetic and geophysical surveys to locate SWMUs/AOCs and associated subsurface structures, historical sampling locations, excavations, stockpiles, and new sampling locations.
- Drilling eight vertical boreholes at SWMU 39-005 to collect subsurface soil and tuff samples.
- Collecting surface and subsurface soil samples using the hand-auger and spade-and-scoop methods.
- Conducting field screening of surface and subsurface soil samples for RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine); TNT (2,4,6-trinitrotoluene); polychlorinated biphenyls (PCBs); and metals; using the resulting data to guide further sample collection for off-site laboratory analysis.
- Excavating and removing the septic tank system at SWMU 39-006(a), including the associated chemical seepage pit and sand filter. Debris material from the septic tank was loaded into waste bins, and waste characterization samples were collected from these rolloff bins.
- Excavating and removing the landfill and disposal trenches at SWMUs 39-001(a) and 39-001(b). Debris material from these excavations was high-piled within the associated area of contamination and waste characterization samples were collected from these waste stockpiles.
- Collecting post-excavation confirmatory soil samples following excavation activities at SWMUs 39-001(a), 39-001(b), and 39-006(a) inactive components.
- Documenting field activities on a daily basis.

C-2.0 TEST PITS AT EXCAVATIONS

Five exploratory trenches were dug at various sites within SWMU 39-001(a) to locate waste. After the waste was located, further excavation continued from the point of exploratory trench. The landfill was initially discovered with an exploratory trench dug immediately north of the asphalt, northeast of building 39-69. The other section of the landfill was found with a separate exploratory trench approximately 30 ft west of the initial excavation. The remaining exploratory trenches verified no waste was present. Two trenches dug at the north and south extent of the eastern-most SWMU are shown in Figure 2.3-2 in the investigation work plan for North Ancho Canyon (LANL 2007, 098280). One was excavated beneath the asphalt "basketball court" in the center of the eastern-most outlined SWMU.

Trenches were dug to an average depth of 12 ft below ground surface (bgs) to determine no waste was present.

C-3.0 EXCAVATION METHODS

Excavation was carried out according to the approved work plan (LANL 2007, 098280).

C-3.1 Equipment

For all excavation equipment arriving on site, an initial inspection was performed. Results were documented on the arrival inspection form. A daily inspection was performed before excavation began, and the results were documented on daily inspection form. If any unsatisfactory condition occurred, the equipment was taken out of service until the condition was corrected.

Before excavation activities began for the day, the Environmental Safety and Health (ES&H) representative inspected the excavation to look for evidence of an unsafe condition or site disturbance. During regular excavation activities, a track-hoe was used to excavate material from the pit. For septic tank/seepage pit excavation, a back-hoe was used because of the proximity to active utilities. Equipment used to transport excavated material to the stockpile included a front-end loader, backhoe, and dump truck. Periodically, the excavated material and/or equipment were scanned by the on-site radiological control technician (RCT) to confirm the equipment was free of radiological contamination.

C-3.2 Underground Utilities

Before any excavation could begin, a Utilities and Infrastructure Map Service (UMAP) representative located and marked the buried utilities in an area based on expected excavation boundaries. Potholes were dug to locate utilities according to the approved pothole plan. Upon completion of potholing, the UMAP representative inspected the site and approved the pothole plan, at which time the excavation permit was issued and excavation began.

C-3.3 Site Controls

All excavations were barricaded as specified in the PLN-5009, Site-Specific Health and Safety Plan for North Ancho Canyon Aggregate Area, including proper signs and, when necessary, traffic-control barricades. During all excavation operations, a spotter was used to ensure safe working conditions as well as to visually inspect the excavated material. Personnel were not permitted to enter the excavations; consequently, no benching or shoring was necessary.

A Stormwater Prevention Program (SWPP) was implemented to ensure site disturbance did not cause undue erosion or migration of sediment. This included installing, inspecting, and maintaining best management practices. Straw wattles were used to mitigate sediment migration. Silt fencing, soil berms, 5-mm plastic sheeting, and silt dykes were also installed as per direction from SWPP representative. Where flow had occurred, rock was placed along with wattles to allow flow but mitigate sediment migration.

At the end of the work day, the equipment was parked on-site within the AOC or SWMU and locked. Personnel were screened out of the area by the RCT, and the site was left in a safe configuration. All excavation activity was documented in the field log book according to TPR-5003, General Field Work and Documentation for North Ancho Canyon Aggregate Area.

C-3.4 Excavation Criteria

Excavation continued in a given location within the site until

- waste was no longer present at that location,
- changes in media were encountered indicating no previous excavation had taken place in the location, and
- confirmation samples were collected at the sides and base of trench and sent to an off-site laboratory. The results were screened against industrial soil screening levels (SSLs) to determine if additional excavation was required.

C-4.0 FIELD-SCREENING METHODS

This section summarizes the field-screening methods used at all SWMUs, AOCs, and the extended drainage. All field screening was conducted as specified in TPR-5001, Field Screening for North Ancho Canyon Aggregate Area.

C-4.1 PCB Field-Screening Method

The RaPID Assay PCB test kit was used as a semiquantitative immunoassay for the analysis of PCBs. The kit applied the principles of enzyme-linked immunosorbent assay (ELISA) to determine PCBs and related compounds. The samples were first extracted utilizing the appropriate Strategic Diagnostics, Inc. (SDI) sample extraction kit. Ten grams of the soil sample was measured and placed in extraction jars containing ball bearings. The solvent from a solvent ampoule was added to the soil. The bottle was capped and shaken vigorously for 1 min and allowed to settle for 1 min or until a solvent layer was observed. The liquid from the top layer was drawn up with a bulb pipette, at least half of the bulb capacity. The sample was filtered in a filtration unit. An adjustable volume pipet was used to measure 25 µL of sample from the filtration unit and added to a premeasured diluent vial (containing 25 mL of diluent). The cap was screwed on tightly and the sample inverted several times. The solution was used as the sample in the RaPID assay procedure.

The RaPID assay procedure was followed using the instructions provided by SDI. The reagents used with the procedure were refrigerated overnight at the Sample Management Office (SMO); before analysis, the reagents were allowed to come to room temperature. The detailed instructions from the SDI RaPID Assay test kit (A00133/A00134) procedure were followed. The range of detection in soil for the kit is 0.5 ppm to 10 ppm (measured as Aroclor-1254). The method detection limit (MDL) is 0.20 ppm. An RPA-II photometric analyzer spectrophotometer was used to interpret the results relative to the standard curve generated from the kit standards.

C-4.2 TNT/RDX Field-Screening Method

The TNT/RDX EnSys soil test systems from SDI were used to field screen soil samples. The TNT test kits were used in conjunction with the RDX test kits. The samples were extracted once and used for both test analyses. The sample was extracted by taking 10 g of soil and 50 mL of acetone placed in extraction jars containing ball bearings. The jar was capped and shaken vigorously for 3 min. This sample was allowed to settle for at least 5 min before either analysis was performed.

For the TNT analyses, 25 mL of the sample was drawn up, taking caution to draw up only the top layer of liquid, with a 30 cc syringe. A syringe filter was attached to the tip of the syringe. The sample was filtered

into a glass cuvette for the initial reading of the sample in the HACH DR/2010 spectrophotometer. After the reading was recorded, one drop of developer solution was added and shaken for 3 s. The cuvette was placed in the spectrophotometer again for the second reading. Values were recorded in supplied worksheets and results calculated for each sample.

For RDX analyses, 8–10 mL of the sample (previously extracted) was slowly drawn up in a 10-cc syringe. Alumina-A cartridges were used to filter nitrate/nitrite interferents, if present. In a waste container, the liquid was discarded until 5.5 mL of the sample remained in the syringe. The 5.5 mL was slowly dispensed into a 13-mL tube. An acetic acid bulb was added to the tube, and the tube was capped and shaken. The plunger from a zinc syringe was separated from the barrel; the sample was poured into syringe and immediately replaced the plunger. The syringe was inverted twice and added to a 50-mL reaction vial containing water and a Nitriver pillow. The reaction vial was capped and shaken for 30 s. The sample was set to incubate for 15 min. After incubation, a 30-cc syringe was disassembled and a syringe filter attached to the tip. The sample was shaken vigorously and poured into the syringe. The syringe was assembled and the sample was expelled into a HACH cuvette. The samples were analyzed utilizing the HACH DR/2010 spectrophotometer, the readings were recorded on a worksheet, and results were calculated for each sample.

The detection range of the test kits were between 1 and 30 ppm for RDX/HMX (octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine) and TNT/TNB (1,3,5-trinitrobenzene)/DNT (2,4 dinitrotoluene). The MDL for the TNT kit was 0.7 ppm and for RDX was 0.8 ppm. Detailed instructions for the TNT/RDX methods are provided in the SDI EnSys soil test system-rapid field screen procedures.

C-4.3 Field Screening for Organic Vapors

Organic vapor screening was conducted using MiniRAE 2000 portable volatile organic compound (VOC) monitor model PGM-7600 photoionization detectors (PIDs). Field screening for organic vapors was conducted during drilling, sampling, and remediation activities according to TPR-5001, Field Screening for North Ancho Canyon Aggregate Area. The PID was equipped with an 11.7-electronvolt (eV) lamp with sensitivity to 1 ppm. All readings were recorded in ppm and are provided in Appendix D of the investigation report. To screen sample media, 125-mL septum amber glass bottles were used. The septum was removed and replaced with a small piece of aluminum foil. The foil was large enough to cover the entire opening of the bottle with the cap removed. The cap was replaced creating an air-tight seal. A fresh piece of aluminum foil was used for each sample screened. During collection of subsurface samples using the hand-auger or spade-and-scoop method, screening was performed by removing sampling material from the target depth, filling the septum bottle half way, replacing the cap and aluminum foil, letting sit for 5 min, and measuring organic vapors with the PID probe inserted through the aluminum seal. The highest observed readings were recorded in ppm and are provided in Table 3.7-1 of the investigation report. All of the subsurface samples collected, using the hand-auger method, were screened for organic vapors at each sample target depth.

C-4.4 Field Screening for Metals

Samples from six sites were field screened for metals with the Niton XL3t-600 x-ray fluorescence (XRF) analyzer, a portable device widely used to identify and quantify the presence of metals in a given media. The sites screened included SWMUs 39-010, 39-002(a) Area 1, 39-007(a), and 39-006(a) and the extended drainages. A total of 638 samples were screened for metals.

Operation of the XRF analyzer was conducted according to IWD-NAC-5004, Operating XRF Analyzer at Los Alamos National Laboratory, Technical Area 39, as well as manufacturer specification, including manuals and manufacturer-directed training. To obtain the most accurate data and pursuant to manufacturer recommendations, the ex-situ sample cup method was consistently used for all samples. This procedure involved homogenizing, sieving, and containerizing sample media. A calibration was performed daily according to manufacturer recommendations. Also, specific manufacturer-supplied Standards were used to ensure proper calibration.

The metals measured by XRF at the North Ancho sites included molybdenum, zirconium, strontium, uranium, rubidium, thorium, lead, selenium, arsenic, mercury, zinc, tungsten, copper, nickel, cobalt, iron, manganese, chromium, vanadium, titanium, scandium, calcium, potassium, sulfur, barium, cesium, tellurium, antimony, tin, cadmium, silver, and palladium. Because the XRF results are not directly comparable to analytical background values (BVs), the samples with the highest 25% of detected concentrations were selected to be collected for off-site laboratory analysis. The metals used to select the 25% for off-site analysis were selected separately for each site based on historical chemicals of potential concern (COPCs) (if available), based on processes, expected COPCs, or metals with the most elevated concentrations above BV. The XRF results for all metals are provided in Appendix D. The metals used for determining sample collection at each site were as follows:

- SWMU 39-002(a) Area 1: copper, lead, and uranium (based on historical data)
- SWMU 39-006(a) Sand Filter: silver, uranium, cesium, and barium
- SWMU 39-007(a): zinc (based on historical data)
- SWMU 39-010: uranium, lead, and zinc
- The Extended Drainages: uranium, arsenic, copper, and chromium.

C-5.0 FIELD INSTRUMENT CALIBRATION PROCEDURES

C-5.1 PID

The PID was calibrated daily in the field, first to ambient air and then a standard manufacturer supplied reference gas (100 ppm isobutylene). The ambient-air calibration determined the zero point of the instrument sensor calibration curve in ambient air. Thus, the background reading for all samples was zero. 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. All daily calibration procedures for the MiniRAE 2000 PID met the manufacturer's specifications for standard reference gas calibration and the requirements of TPR-5001, Field Screening for North Ancho Canyon Aggregate Area.

C-5.2 XRF

A calibration of the XRF analyzer was performed according to the manufacturer's recommendations. The analyzer is programmed to calibrate for a specific, predetermined period to ensure proper operation. Also, specific manufacturer-supplied standards were used to ensure proper calibration. This was accomplished once a day or every 20 samples by scanning the standard and comparing the resulting data to independently derived values supplied by the manufacturer. All calibration/quality assurance data were automatically saved and included in the XRF field-screening data files.

C-5.3 PCB Test

The RPA-I photometer utilized for the PCB field-screening analysis are preprogrammed with various RaPID assay protocols. The parameter settings specific for the PCB RaPID assay test kits for screening in soils were utilized. Before each use, the settings were checked to ensure the settings remained unchanged. A quality control solution at approximately 3 ppb (as Aroclor-1254) was included with every run and treated as the same as unknowns. Standards and negative controls were included in each run to verify the proper calibration curves were correct.

C-5.4 RDX/TNT Test

The HACH DR/2010 spectrophotometer contained preprogrammed settings for TNT and RDX field-screening analysis. Each RDX and TNT kit included controls that were run before each kit was used and/or daily to ensure settings remained unchanged.

C-6.0 SOIL, ROCK, AND SEDIMENT SAMPLING METHODS

All sampling was conducted according to TPR-5004, Field Soil Sampling for North Ancho Canyon Aggregate Area; IWD-NAC-5002, Drilling and Sampling at Los Alamos National Laboratory, Technical Area 39; and FIP PLN-5010, Field Implementation Plan for the Investigation Work Plan for the North Ancho Canyon Aggregate Area.

C-6.1 Surface

Where practicable, surface samples were collected using the spade-and-scoop method, including excavation sampling from the bucket of excavator. Generally, any sample with a bottom depth at or less than 0.5 ft was considered to be a surface sample. At some locations, the surface soil was too compact, and soil was collected using other methods. All sample collection methods were noted in the applicable sample collection log (SCL).

Sample media were collected using a stainless-steel scoop, placed in a 3- or 4-L stainless-steel bowl, and submitted to the RCT for scanning. Along the extended drainage, the method varied in that the media was placed in an 8-oz polyethylene, sealable bag for transportation in a backpack. As soon as possible, and always within the same work shift, the samples were taken back to the sample collection trailer, homogenized, and placed in the bowls for screening by an RCT.

C-6.2 Subsurface

Hand-auger collection was accomplished using a preengineered stainless-steel hand auger to collect media from depths greater than 0.5 ft or where ground compaction conditions did not allow samples to be collected by the spade-and-scoop method. The hand auger was measured, and the shaft was marked with tape to confirm the depth of the auger bucket. Media brought out of the sample hole, which was not part of the sample target depth, was placed next to the sample hole. Once the target depths for sampling were reached, the media was poured from the auger bucket directly into a 3- or 4-L stainless-steel bowl, homogenized and screened by the RCT.

C-6.3 QA/QC Samples

For all organic volatile samples collected, a field trip blank (FTB) was present to collect any ambient VOCs or semivolatile organic compounds (SVOCs). FTBs consisted of a 40 mL septum glass bottle containing volatile blank sand. Wherever possible, samples were collected and bottled away from vehicle or generator exhaust, gasoline, or other possible sources of contamination. The FTB was placed in open air in the immediate area of sample collection and bottling. The FTB was collected, labeled, custody-sealed, and placed with the last representative sample in the same cooler. This procedure was performed after every 10 field samples were collected or once a day, whichever was more frequent.

Sample rinsate blanks were collected using deionized water to rinse all equipment that was in contact or in possible contact with sampling media. This was accomplished using 3- or 4-L bowls to pour deionized water over equipment and collect the resulting rinsate water. The water was then placed in the appropriate bottles, labeled, custody-sealed, and placed in a cooler with the last representative sample. This procedure was performed after every 10 field samples were collected or once a day, whichever was more frequent.

Field-duplicate samples were collected for a representative field sample. Media was taken from the same location as the media of the field sample, placed in a 3- or 4-L stainless-steel bowl, homogenized, and submitted to the RCT for screening. This procedure was performed after every 10 field samples were collected or once a day, whichever was more frequent.

C-6.4 Sample Documentation and Handling

Sample bottle kits were prepared before field-sampling operations began in accordance to field SCLs. Every morning, leak-proof blue ice was taken out of a dedicated freezer at the SMO and placed in coolers to facilitate cooling the samples after they were collected. Sample bottles were provided by the SMO, as were FTBs, SCLs, and custody seals.

Samples were bottled and documented in a tow-behind mobile sample-collection trailer. Sampling media collected in the field was bottled as close to the point of collection and as soon as possible. Samples were homogenized thoroughly and, after screening by an RCT, bottled using 3- and 4-L stainless-steel bowls and scoops. The bottles were filled leaving no air space in the bottle where practicable. In all instances, the order of the bottles filled was consistent with SOP TPR-5004, Field Soil Sampling for North Ancho Canyon Aggregate Area. The bottles were filled in the following order:

- VOCs
- SVOCs
- Other organic parameters (i.e., PCBs, high explosives, etc.)
- Metals
- Other inorganic parameters
- Radiochemistry

During RCT screening and sample bottling, the SCL was filled out for the sample collected. Information documented included the media collected, field sampling location, date and time, depth (both below ground surface and below target feature), and field-screening information, including radiological activity. The SCLs were completed, reviewed and signed before the samples were transported to the SMO. Also, at the time of bottling, the sample bottle labels were filled out with the date and time and affixed to the

appropriate bottles. The bottles were then placed in a polyethylene sealable bag and stacked in a cooler. After they reached the SMO, the samples were organized, inspected, and submitted to SMO personnel for off-site shipping. The SCLs were photocopied, and the blue ice was replaced in the dedicated freezer after decontamination.

After screening by an RCT, samples for field screening were placed in polyethylene sealable bags labeled with the sample location, SWMU/AOC, date and time of collection. They were then organized and submitted to the field-screening personnel at the end of the day.

C-6.5 Decontamination of Sampling Equipment

All decontamination was done per TPR-5004, Field Soil Sampling for North Ancho Canyon Aggregate Area. Decontamination was completed between each sampling location to prevent cross-contamination. The agent used, called Alconox, was a volatile blank and engineered for laboratory decontamination of sample equipment. The agent was mixed according to manufacturer recommendations printed on each package. For gross contamination, a small wire brush was used to remove clay or mud. This was done in the sample-collection trailer or at the location where the sample was collected. For detailed decontamination, Alconox mixed with deionized water was used in a small hand sprayer. No decontamination fluids were generated from decontamination of the sampling equipment.

To decontaminate large sample-collection equipment such as the excavator bucket, a large wire brush, scraper, rubber mallet, paper towels and a 5-gal. bucket were used. Gross contamination was removed first using the scraper and mallet. The equipment was then sprayed with Alconox, wiped with paper towels, and visually inspected. If the equipment was required to be moved off-site or to another SWMU or AOC, the RCT preformed a scan and smeared the equipment before it was moved to verify it was contaminant free.

C-7.0 GEODETIC SURVEY METHODS

Geodetic survey methodology varied depending on application, site conditions, and required accuracy. Sample locations and site features were surveyed using one or a combination of the following instruments or systems: (1) Trimble VX total station; (2) Trimble real-time kinematic global positioning system (GPS) consisting of a 5700 base station receiver, Zephyr base station antenna, HPB450 base station radio, and R8 rover unit; and (3) Trimble GeoXT submeter differential GPS. The high-speed laser scanning functionality of the Trimble VX was employed during surveys of excavations at SWMUs 39-001(a), 39-001(b), and 39-006(a) inactive components to capture accurate, high-resolution data sets thoroughly documenting disposal unit or excavation boundaries and morphology. During sample acquisition at SWMUs 39-001(a) and 39-001(b), field personnel utilized the total station in direct reflex mode to remotely stake out predetermined sample locations for heavy equipment operators collecting sample media.

All geodetic surveys were conducted in accordance with EP-ERSS-SOP-5028, Coordinating and Evaluating Geodetic Surveys.

C-8.0 IDW STORAGE AND DISPOSAL

All waste management activities were completed according to the waste characterization strategy form (WCSF). Nitrile gloves, polyethylene bags, aluminum foil, bottles, paper towels, and any other field equipment which came into contact with sample media and could not be adequately decontaminated was

placed in polyethylene bags, labeled, and placed into labeled 55-gal. drums within the area of contamination. Equipment was visually inspected for gross contamination before being placed in waste drums.

Field-screening laboratory waste was likewise labeled and placed into the appropriate poly 55-gal drums at the site. No liquid decontamination fluids were generated from sampling activities. All materials (cardboard boxes, custody label backs, etc.) that did not come into contact with sampling media were discarded in on-site municipal waste collection dumpsters.

Characterization of the waste was conducted using acceptable knowledge of the waste material, the extent of contamination of the contact waste, the methods of generation, as well as analytical data available for the media with which it may have come in contact.

C-9.0 FIELD CONDITIONS RESULTING IN DEVIATIONS FROM THE APPROVED WORK PLAN

C-9.1 AOC 39-002(f)

All sampling locations at AOC 39-002(f) were required to be moved as a result of a concrete pad placed for air conditioner for building 39-88, and the building foundation footing itself. Therefore, sample locations were generally moved away from the building, and some were moved next to concrete pad. The final sampling locations appear on the sampling location identification map in section 5 (Figure 5.8-1) of the investigation report.

- Locations 39-604512 and 39-604513 were moved 4 ft east-southeast
- Location 39-604514 was moved 6.75 ft east-northeast
- Location 39-604515 was moved 3 ft east-southeast
- Location 39-604516 was moved 4 ft northeast

C-9.2 SWMU 39-002(a) Area 1

Location 39-604805 was moved approximately 6 in. south because it was located under an air-conditioning unit.

Samples were not collected from field-screening locations 130 and 118. The locations are directly under the concrete walkway between buildings 39-2 and 39-62. Moving them to allow for sampling would have put them in extremely close proximity to neighboring samples.

Between buildings 39-2 and 39-62, there was storage of construction materials along the north wall of building 39-2. Location 39-604811 was moved 1.3 ft north because the original location was under these materials.

Because of the concrete foundation footing of building 39-2, field-screening location 137 had refusal for bottom two depth, and samples were not collected. Also because of footing, locations 138 and 139 (location 39-604813) had refusal at bottom depths, and samples were not collected.

C-9.3 SWMU 39-002(a) Area 2

Wipe samples at this SWMU were not collected. This site is a former indoor satellite accumulation area that is currently actively in use; therefore, it is inaccessible for sampling.

C-9.4 SWMU 39-006(a) Inactive Components

The sewer line linking the inactive septic tank and inactive sand filter was determined to be active, and thus, removal and sampling of the pipe did not take place.

The inactive septic tank and inactive seepage pit confirmatory sampling locations were determined by the orientation of the footprints of these features, which varied from the footprint shown in the figure in the work plan. As a result, confirmatory samples were not collected in the location indicated in the figure in the work plan. However, the samples were placed in the same configuration within the footprints of these features.

C-9.5 SWMU 39-006(a) Active Components

Influent and effluent samples for the active septic tank and the active sand filter were not taken because sampling would disrupt an active septic system whose lines are currently in use.

C-9.6 AOC 39-002(b)

AOC 39-002(b) sampling locations were all beneath a concrete pad, directly outside of the door to building 39-006. No samples were collected at this location because collecting samples with mechanical tools would disrupt operations at the adjacent active firing site. An attempt was made to punch through concrete to allow for sampling. The concrete pad was too substantial to allow for reasonable collection with hand tools.

C-9.7 AOC 39-002(c)

Location 39-604746 was moved 1.75 ft south because of its proximity to underground power line marked by UMAP.

C-9.8 SWMU 39-010

Proposed field-screening location 16 was not taken because it was located under the road and would disrupt operations at the adjacent firing site and traffic.

Two locations, 39-604436 and field screening location 501, were added northeast of soil dump between the dump and the drainage. The new locations were added to ensure that the sampling grid would extend to the edge of the soil dump area.

C-9.9 SWMU 39-008

Two sample locations situated high on the vertical wall of the amphitheater cliff were not collected because of safety concerns.

A sample from location 39-604718 was collected 6.5 ft southeast of the proposed location because of safety concerns at the original location.

C-9.10 SWMU 39-007(a)

Locations 39-604857 and 39-604858 were beneath the concrete pad east of the building. Location 39-604857 was moved 3 ft northeast, and location 39-604858 was moved 0.5 ft south to accommodate collection without removal of the concrete.

C-9.11 SWMU 39-004(d)

Dioxins/furans samples were not collected at this SWMU. The radiological activity present with these samples exceeded the criteria for acceptance by the off-site laboratory conducting dioxins/furans analysis.

C-9.12 Extended Drainages

Location 259 was located under the parking lot asphalt outside the entry gate to Technical Area 39. Parking lot construction obscured the drainage location and made collecting a sample at the correct elevation impracticable.

Samples in the extended drainages were collected according to the approved work plan. As a result, actual locations varied from the proposed locations in the work plan figures. However, figures were used as a guide for general sample location requirements.

C-9.13 SWMU 39-005

Two locations, 39-604838 and 39-604839, were moved because of their proximity to the building awning, which impeded collecting samples, given the height of the auger. Location 39-604838 was moved 7 ft northwest. Refusal in the form of welded tuff was encountered, and the bottom two depths were not sampled. Location 39-604839 was moved 27.5 ft west to the opposite side of the SWMU and was still within the footprint of the seepage pit.

C-10.0 REFERENCE

The following list includes all documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ER ID. 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 New Mexico Environment Department 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), September 2007. "Investigation Work Plan for North Ancho Canyon Aggregate Area," Los Alamos National Laboratory document LA-UR-07-5947, Los Alamos, New Mexico. (LANL 2007, 098280)

Table C-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 sampling and analysis plan, and collecting a discrete grab sample. The sample is typically placed in a clean stainless-steel bowl for transfer into various sample containers.
Hand-Auger Sampling	This method is typically used for sampling soil or sediment at depths of less than 10–15 ft but may in some cases be used for collecting samples of weathered or nonwelded tuff. The method involves hand-turning a stainless-steel bucket auger (typically 3–4 in. inside diameter [I.D.]), creating a vertical hole which can be advanced to the desired sample depth. When the desired depth is reached, the auger is decontaminated before advancing the hole through the sample depth. The sample material is transferred from the auger bucket to a stainless-steel sampling bowl before filling the various required sample containers.
Headspace Vapor Screening	Individual soil, rock, or sediment samples are field-screened for VOCs by placing a portion of the sample in a glass container with a foil-sealed cover. The container is sealed and gently shaken and allowed to equilibrate for 5 minutes. The sample is then screened by inserting a PID probe into the container and measuring and recording any detected vapors. PIDs must use lamps with voltage of 10.6 eV or higher.
Handling, Packaging, and Shipping of Samples	Field team members seal and label samples before packing and ensure that the sample containers and the containers used for transport are free of external contamination. Field team members package all samples to minimize the possibility of breakage during transportation. After all environmental samples are collected, packaged, and preserved, a field team member transports them to either the SMO or an SMO-approved radiation screening laboratory under COC. The SMO arranges for shipping of samples to analytical laboratories. The field team member must inform the SMO and/or the radiation screening laboratory coordinator when levels of radioactivity are in the action-level or limited-quantity ranges.
Sample Control and Field Documentation	The collection, screening, and transport of samples are documented on standard forms generated by the SMO. These include sample collection logs, COC forms, and sample container labels. Collection logs are completed at the time of sample collection and are signed by the sampler and a reviewer who verifies the logs for completeness and accuracy. Corresponding labels are initialed and applied to each sample container, and custody seals are placed around container lids or openings. The COC forms are completed and assigned to verify that the samples are not left unattended.
Field Quality Control Samples	Field quality control samples are collected as directed in the Consent Order and SOP-5059 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 is collected in a sample container and submitted for laboratory analysis. *Trip Blanks*: required for all field events that include the collection of samples for VOC analysis. Trip blanks containers of certified clean sand that are opened and kept with the other sample containers during the sampling process.

Table C-1.0-1 (continued)

Method	Summary
Field Decontamination of Drilling and Sampling Equipment	Dry decontamination is the preferred method to minimize the generation of liquid waste. Dry decontamination may include the use of a wire brush or other tool for removing soil or other material adhering to the sampling equipment, followed by use of a commercial cleaning agent (nonacid, waxless cleaners) and paper wipes. Dry decontamination may be followed by wet decontamination if necessary.
Containers and Preservation of Samples	Specific requirements/processes for sample containers, preservation techniques, and holding times are based on U.S. Environmental Protection Agency guidance for environmental sampling, preservation, and quality assurance. Specific requirements for each sample are printed on the sample collection logs provided by the SMO (size and type of container—e.g., glass, amber glass, and polyethylene). All samples are preserved by placing them in insulated containers with ice to maintain a temperature of 4˚C. Other requirements, such as nitric acid or other preservatives, may apply to different media or analytical requests.
Coordinating and Evaluating Geodetic Surveys	Geodetic surveys focus on obtaining survey data of acceptable quality for use during project investigations. Geodetic surveys are conducted with a Trimble 5700 DGPS. The survey data conform 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 are expressed as State Plain Coordinate System 83, NM Central, U.S. feet coordinates. All elevation data are reported relative to the National Geodetic Vertical Datum of 1983.
Management and Characterization of Waste	Investigation-derived waste (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 shall be adequate to comply with on- or off-site waste acceptance criteria. All stored IDW is marked with appropriate signage and labels. Drummed IDW is stored on pallets to prevent deterioration of containers. Generators are required to reduce the volume of waste generated by as much as is technically and economically feasible. The means to store, control, and transport each potential waste type and its classification is determined before the start of field operations that generate waste. A waste storage area is established before waste is generated. Waste storage areas located in controlled areas of the laboratory are controlled as needed to prevent inadvertent addition of waste or management of wastes by unauthorized personnel. Each container of waste generated is individually labeled with waste classification, item identification number, and radioactivity (if applicable), immediately following containerization. All waste is segregated by classification and compatibility to prevent cross-contamination. Management of IDW is discussed in Appendix G.

Appendix D

Field-Screening Data

A combination of field screening was proposed for select sites at Technical Area 39 (TA-39) North Ancho Canyon Aggregate Area. Of those sites, a random selection of 30% of the field-screened samples were sent to off-site laboratories for analyses. The remaining field-screening results were reviewed, and if they exceeded background values, detection limits, or limits specific to each test, they were resampled and also sent to off-site laboratories for analyses. The field screening was conducted for polychlorinated biphenyls (PCB); TNT (2,4,6-trinitrotoluene); RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine); and metals with an x-ray fluorescence (XRF) spectrophotometer for select sites. All samples were field screened for radionuclides (alpha, beta), and organic chemicals with a photoionization detector (PID).

PCB was field screened at Solid Waste Management Units (SWMUs) 39-010, 39-006(a) inactive components and sand filter, SWMU 39-007(a), and the extended drainages. Samples that resulted in detects were resampled and sent to off-site laboratories for analyses. The range of detection in soil for the RaPID Assay kit was 0.5–10 ppm (measured as Aroclor-1254). The minimum detection limit is 0.20 ppm.

TNT and RDX were field screened at SWMUs 39-010, 39-005, 39-002(a) Area 1, 39-006(a), and the extended drainages. The detection range of the test kits was between 1 and 30 ppm for RDX/HMX (octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine) and TNT/TNB (1,3,5-trinitrobenzene)/DNT (4,6-dinitrotoluene). The minimum detection level for the TNT kits was 0.7 ppm and 0.8 ppm for RDX. Samples with results above the detection levels for their respective kits were sampled and sent to off-site laboratories for analyses.

Alpha/beta and PID were field screened at SWMUs 39-010, 39-006(a), 39-007(a), 39-002(a) Area 1, 39-001(b), and the extended drainages. Alpha/beta field screening was performed by a radiological control technician. PID field screening was performed by a sample technician. Samples with results that exceeded twice the background values (BVs) were sent to off-site laboratories for analyses. The BVs were specific to each site daily.

The metals measured by XRF at the North Ancho sites included molybdenum, zirconium, strontium, uranium, rubidium, thorium, lead, selenium, arsenic, mercury, zinc, tungsten, copper, nickel, cobalt, iron, manganese, chromium, vanadium, titanium, scandium, calcium, potassium, sulfur, barium, cesium, technetium, antimony, tin, cadmium, silver, and palladium. Because the XRF results are not directly comparable to analytical BVs, the samples with the highest 25% of detected concentrations were selected to be collected for off-site laboratory analysis. The metals used to select the 25% for off-site analysis were selected separately for each site based on historical chemicals of potential concern (COPCs) (if available), based on processes, expected COPCs, or metals with the most elevated concentrations above BV. The metals used for determining sample collection at each site were as follows:

- SWMU 39-002(a) Area 1: copper, lead, and uranium (based on historical data)
- SWMU 39-006(a) Sand Filter: silver, uranium, cesium, and barium
- SWMU 39-007(a): zinc (based on historical data)
- SWMU 39-010: uranium, lead, and zinc
- The Extended Drainages: uranium, arsenic, copper, and chromium.

The field-screening results are presented in Attachment D-1, Tables D-1.0-1 and D-1.0-2 (on CD included with this report).

Attachment D-1

Tables D-1.0-1 and D-1.0-2
(on CD included with this document)

Appendix E

Analytical Program

E-1.0 INTRODUCTION

This appendix discusses analytical methods and data-quality review for all samples collected in support of investigations conducted at Technical Area 39 (TA-39), the North Ancho Canyon Aggregate Area. The North Ancho Canyon Aggregate Area, located in TA-39, is in the southeast portion of Los Alamos National Laboratory (LANL) and is bordered on the south by Bandelier National Monument.

Quality assurance (QA)/quality control (QC) and data validation procedures were implemented in accordance with the requirements of LANL's "Quality Assurance Project Plan Requirements for Sampling and Analysis" (LANL 1996, 054609) and LANL's analytical services statement of work (SOW) for contract laboratories (LANL 1995, 049738; LANL 2000, 071233). The results of the QA/QC procedures were used to estimate the accuracy, bias, and precision of the analytical measurements. Samples for QC include method blanks, matrix spikes (MSs), laboratory control samples (LCSs), internal standards, initial and continuing calibrations, surrogates, and tracers.

The type and frequency of laboratory QC analyses are described in the analytical laboratories SOWs (LANL 1995, 049738; LANL 2000, 071233). Other QC factors, such as sample preservation and holding times, were also assessed in accordance with the requirements outlined in standard operating procedure (SOP) EP-ERSS-SOP-5056, Sample Containers and Preservation. Routine data validation was performed for each data package. The analytical data, instrument printouts, data validation reports, sample collection logs, and chain of custody forms are provided in Appendix F (on CD).

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).

The historical data were originally validated using the SOPs below:

- SOP-15.01, Routine Validation of Volatile Organic Data
- SOP-15.02, Routine Validation of Semivolatile Organic Data
- SOP-15.03, Routine Validation of Organochlorine Pesticides and Polychlorinated Biphenyls Data
- SOP-15.05, Routine Validation of Inorganic Data
- SOP-15.06, Routine Validation of Gamma Spectroscopy Data
- SOP-15.07, Routine Validation of Chemical Separation Alpha Spectrometry, Gas Proportional Counting, and Liquid Scintillation Data

The recent data were validated using the SOPs below:

- SOP-5161, Routine Validation of Volatile Organic Data
- SOP-5162, Routine Validation of Semivolatile Organic Compound (SVOC) Analytical Data
- SOP-5163, Routine Validation of Organochlorine Pesticide and PCB Analytical Data
- SOP-5164, Routine Validation of High Explosive Analytical 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

- SOP-5168, Routine Validation of LC/MS/MS High Explosives Analytical Data
- SOP-5169, Routine Validation of Dioxin Furan Analytical Data (EPA Method 1618 and SW-846 EPA Method 8290)
- SOP-5191, Routine Validation of LC/MS/MS Perchlorate Analytical Data (SW-846 EPA Method 6850)

As a result of the data validation and assessment efforts, qualifiers are assigned to the analytical records as appropriate. The data qualifiers used in the data validation procedures are defined in Appendix A.

E-2.0 ANALYTICAL DATA ORGANIZATION

The analytical data presented in this report were collected during investigations and corrective actions listed below:

- 1994 Resource Conservation and Recovery Act (RCRA) facility investigation (RFI), and the 1997 excavation of test pits at Solid Waste Management Unit (SWMU) 39-001(a)
- 1995 Sampling and 1997 Voluntary Corrective Action (VCA) at SWMU 39-002(a) Area 1
- 1995 Phase I RFI at SWMUs 39-004(c) and 39-004(d)
- 1993 RFI and 1996 Sampling at SWMU 39-006(a)
- 1995 VCA and 2001 Sampling for PCBs at SWMU 39-007(a)
- 1993 Phase I RFI at SWMU 39-008
- 2009 North Ancho Aggregate Area Sampling

Each of the North Ancho Canyon Aggregate Area sites was investigated in a single event or in multiple events. However, the data presented are evaluated as one data set.

E-3.0 INORGANIC CHEMICAL ANALYSIS SUMMARY

Samples collected from the North Ancho Canyon Aggregate Area were analyzed for inorganic chemicals. A total of 752 samples (52 field duplicates) were analyzed for target analyte list (TAL) metals, 356 samples (52 field duplicates) were analyzed for nitrate, 704 samples (52 field duplicates) were analyzed for cyanide, 14 samples were analyzed for uranium, and 616 samples (52 field duplicates) were analyzed for perchlorate. The analytical methods used are listed in the Table E-3.0-1.

E-3.1 Inorganic Chemical QA/QC Samples

All procedures were followed as required by the analytical laboratory's statement of work (SOW) (LANL 1995, 049738; LANL 2000, 071233) and applicable published analytical methodologies. LCSs, preparation blanks, MS samples, laboratory duplicate samples, interference check samples (ICSs), and serial dilution samples were analyzed to assess the accuracy and precision of inorganic chemical analyses. Each of these QA/QC sample types is defined in the analytical services SOW (LANL 1995, 049738; LANL 2000, 071233) and is described briefly in the sections below.

The LCS serves as a monitor of the overall performance of each step during the analysis, including sample digestion. Following LANL SOPs, analytical results were qualified according to National Functional Guidelines (EPA 1994, 048639) if the LCS recovery indicated an unacceptable bias in the

measurement of individual analytes. For inorganic chemicals in soil/tuff, the percent recovery should be within the control limits of 75%–125% (LANL 1995, 049738; LANL 2000, 071233).

Preparation blanks are used to measure bias and potential cross-contamination. All inorganic chemical results should be below the method detection limit (MDL) in the preparation blank.

MS samples assess the accuracy of inorganic chemical analyses. An MS sample is designed to provide information about the effect of each sample matrix on the sample preparation procedures and analytical technique. The percent recovery of each chemical in the MS samples should be within the control limits of 75%–125% (LANL 1995, 049738; LANL 2000, 071233).

Laboratory duplicate samples assess the precision of inorganic chemical analyses. The relative percent difference (RPD) between the sample and laboratory duplicate should be ±35% for soil (LANL 1995, 049738; LANL 2000, 071233).

ICSs assess the accuracy of the analytical laboratory's interelement and background correction factors used for inductively coupled plasma emission spectroscopy. The ICS percent recovery should be within 80%–120% (LANL 1995, 049738; LANL 2000, 071233).

Serial dilution samples measure potential physical or chemical interferences and correspond to a sample dilution ratio of 1:5. The chemical concentration in the undiluted sample must be at least 50 times the method detection limit (MDL) (100 times for inductively coupled plasma mass spectroscopy) for valid comparison. For sufficiently high concentrations, the relative difference should be within 10%.

The following inorganic chemical data for soil, tuff, fill and sediment were qualified as estimated (J):

- The results for 18 metals in 65 samples and uranium in four samples were estimated (J) because the results were less than the estimated quantitation limit (EQL) but greater than the MDL.
- The results for 14 metals in 593 samples, perchlorate in 41 samples, nitrate in 54 samples and cyanide in 84 samples were estimated (J) because the results were reported as detected between the instrument detection limit (IDL) and the estimated detection limit (EDL).
- The results for 6 metals in 142 samples and cyanide in 12 samples were 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% for soil samples.
- The results for aluminum in 17 samples; calcium, copper, lead in 4 samples; and iron and zinc in 11 samples were estimated (J) because both the sample and duplicate sample results were greater than or equal to 5 times the RL and the duplicate RPDs were greater than 35%.
- The results for 18 metals in one sample and silver in three samples were estimated (J) because the samples were analyzed outside specific method tune time criteria.
- The results for 8 metals in 21 samples were estimated (J) because the serial dilution sample RPDs were greater than 10% and the sample results were greater than 50 times the MDL (greater than 100 times the MDL for inductively coupled plasma mass spectrometry).
- The results for 15 metals in 93 samples were estimated (J) because the internal standard (IS) area count for the quantitating IS was greater than 125% in relation to the metals initial calibration blank.
- The results for 11 metals in 139 samples and nitrate in 14 samples were considered estimated (J) because these analytes identified were greater than 5 times the concentration in the method blank.

- The results for nitrate in one sample and calcium in eight samples were estimated (J) because the initial calibration verification (ICV) and/or continuing calibration verification (CCV) were recovered outside the method-specific time.
- The results for perchlorate in 14 samples were estimated (J) because the ICS recovery was not within ±20% of the known value.
- The results for perchlorate in two samples were estimated (J) because the internal standard area was less than 70% but greater than 25% of the average of that obtained from the calibration standards.

The following inorganic chemical data for soil, tuff, fill, and sediment were qualified as estimated and biased low (J-):

- The results for 11 metals in 82 samples were estimated and biased low (J-) because the analytes were recovered below the lower acceptance level (LAL) but greater than 30% in the associated spike sample.
- The results for 15 metals in 170 samples, nitrate in 45 samples, and cyanide in 22 samples were estimated and biased low (J-) because the associated MS recoveries were less than the LAL but greater than 10%.
- The results for cyanide in two samples were estimated and biased low (J-) because the extraction/analytical holding times were exceeded by less than 2 times the published method for holding times.

The following inorganic chemical data for soil, tuff, fill, and sediment were qualified as estimated and biased high (J+):

- The results for seven metals in 37 samples were estimated and biased high (J+) because the analytes were recovered above the upper acceptance level (UAL) but less than 150% of the associated spike sample.
- The results for manganese in 19 samples were estimated and biased high (J+) because the associated MS recoveries were less than the LAL but greater than 10%.
- The results for 20 metals in 502 samples and nitrate in 15 samples were estimated and biased high (J+) because the associated MS recoveries were greater than the UAL.

The following inorganic chemical data for soil, tuff, fill, and sediment were qualified as not detected (U):

- The results for 6 metals in 107 samples, nitrate in 29 samples and cyanide in 76 samples were not detected (U) because the sample results were less than or equal to 5 times the concentration of the related analyte in the method blank, which indicates the reported detections were considered indistinguishable from contamination in the blank.
- The results for 13 metals in 88 samples were not detected (U) because the results were less than 5 times the amount in the preparation blank.
- The results for 8 metals in 391 samples, nitrate in 11 samples and cyanide in 31 samples were not detected (U) because the sample results were less than or equal to 5 times the concentration of the related analyte in the initial calibration blank (ICB)/continuing calibration blank (CCB), which indicates the reported detection is considered indistinguishable from contamination in the blank.

- The results for 6 metals in 84 samples, nitrate in 11 samples, perchlorate in 2 samples, and cyanide in 1 sample were not detected (U) because the sample results were less than or equal to 5 times the concentration of the related analytes in the trip blanks, equipment blanks, or rinsates which indicates the reported detections were considered indistinguishable from contamination in the blanks.

The following inorganic chemical data for soil, tuff, fill, and sediment were qualified as estimated and not detected (UJ):

- The results for cyanide in six samples were estimated and not detected (UJ) because the sample and the duplicate sample results were greater than or equal to 5 times the RL, and the duplicate (RPD) was greater than 35% for soil samples.
- The results for antimony in 10 samples were estimated and not detected (UJ) because the LCS percent recoveries were less than the LAL but greater than 10%.
- The results for selenium in four samples were estimated and not detected (UJ) because the mass calibrations were not within 0.1 atomic mass unit, or percent risk-specific dose (%RSD) exceeded 5% for any isotope (beryllium, magnesium, cobalt, indium, and lead).
- The results for antimony in one sample and selenium in one sample were estimated and not detected (UJ) because the IS area counts for the quantitating IS were greater than 125% in relation to the metals initial calibration blank.
- The results for antimony in 30 samples were estimated and not detected (UJ) because the metals ICS percent recovery values were greater than or equal to 50% and less than 80%.
- The results for 8 metals in 89 samples were estimated and not detected (UJ) because the analytes were recovered below the LAL but greater than 30% in the associated spike sample.
- The results for 6 metals in 77 samples, nitrate in 5 samples, and cyanide in 67 samples were estimated and not detected (UJ) because the associated MS recoveries were less than the LAL but greater than 10%.
- The results for 5 metals in 101 samples and nitrate in 3 samples were estimated and not detected (UJ) because the associated MS recoveries were greater than the UAL.
- The results for nitrate in 2 samples and perchlorate in 10 samples were estimated and not detected (UJ) because the ICV and/or CCV were recovered outside the method-specific limits.
- The results for cyanide in 32 samples were estimated and not detected (UJ) because the extraction/analytical holding times were exceeded by less than 2 times the published method for holding times.
- The results for perchlorate in 38 samples were estimated and not detected (UJ) because the ICS recovery was not within $\pm$20% of the known value.
- The results for perchlorate in 60 samples were estimated and not detected (UJ) because the IS area count was less than 70% but greater than 25% of the average of that obtained from the calibration standards.
- One result for perchlorate was estimated and not detected (UJ) because the IS was greater than 130% of the average of that obtained from the calibration standards.

The following inorganic chemical data for soil, tuff, fill, and sediment were qualified as rejected (R):

- The results for antimony in 22 samples were rejected (R) because the associated spike sample recovered less than 30%.
- The results for manganese in 6 samples and selenium in 20 samples were rejected (R) because the associated MS recoveries were less than 10%.
- The results for cyanide in 16 samples were rejected (R) because the extraction/analytical holding times were exceeded by greater than 2 times the published method for holding times.

All inorganic data collected, with the exception of rejected data, were used in the evaluation of risk assessments (Appendix H) and the evaluation of the nature and extent of contamination (Appendix B).

E-4.0 ORGANIC CHEMICAL ANALYSIS SUMMARY

Samples collected at the North Ancho Canyon Aggregate Area were analyzed for organic chemicals. A total of 555 samples (49 field duplicates) were analyzed for volatile organic chemicals (VOCs); 748 samples (52 field duplicates) were analyzed for semivolatile organic chemicals (SVOCs); 645 samples (52 field duplicates) were analyzed for polychlorinated biphenyls (PCBs); 8 samples were analyzed for pesticides; 691 samples (48 field duplicate) were analyzed for high explosives (HE); 81 samples (5 field duplicates) were analyzed for dioxins and furans; and 1 sample was analyzed for total petroleum hydrocarbons (TPH) diesel range organics (DRO) and TPH–gasoline range organics (GRO). The methods used to analyze the samples are listed in the Table E-4.0-1.

E-4.1 Organic Chemical QA/QC Samples

Calibration verifications, LCSs, method blanks, MS samples, surrogates, and IS were analyzed to assess the accuracy and precision of the organic chemical analyses. Each of these QA/QC sample types is defined in the analytical services SOWs (LANL 1995, 049738; LANL 2000, 071233) and described briefly below.

Calibration verification, consisting of initial and continuing verification, establishes the quantitative relationship between the response of the analytical procedure and the concentration of the target analyte. The initial calibration verifies the accuracy of the calibration curve and 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 whether analyte identification criteria, such as retention times and spectral matching, are being met.

The LCS is a sample of a known matrix that has been spiked with compounds that are representative of the target analytes, and it serves as a monitor of the overall performance of a “controlled” sample. The LCS is the primary demonstration 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 acceptable criteria. LCS recoveries should fall into the control limits of 75%–125% (LANL 1995, 049738; 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 contract-required detection limit in the method blank (LANL 1995, 049738; LANL 2000, 071233).

MS samples are used to measure the ability to recover prescribed analytes from a native sample matrix. MS samples are aliquots of the submitted samples spiked with a known concentration of the target analyte(s). Spiking typically occurs before sample preparation and analysis. The spike sample recoveries should be within the acceptance range of 75%–125% (LANL 1995, 049738; LANL 2000, 071233).

A surrogate compound (surrogate) is an organic chemical compound used in the analyses of organic target analytes that is similar in composition and behavior to the target analytes but 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 the extraction and analysis. The recovery percentage of the surrogates must be within specified ranges, or the results may be rejected or assigned a qualifier (LANL 1995, 049738; LANL 2000, 071233).

IS are chemical compounds added to every blank, sample, and standard extract at a known concentration. They are used to compensate for analyte concentration changes that might occur during storage of the extract and quantitation variations that can occur during analysis. The IS is used as the basis for quantitation of target analytes. The percent recovery for IS should be within the range of 50%–200% (LANL 1995, 049738; LANL 2000, 071233).

The following organic chemical data for soil, tuff, fill, and sediment were qualified as estimated (J):

- The results for dichlorobenzene[1,2-] and dichlorobenzene[1,4-] in one sample; isopropyltoluene[4-] in 3 samples; and trimethylbenzene[1,2,4-] in 6 samples were estimated (J) because the IS area counts for the quantitating IS were less than 50% but greater than 10% for organics window relation to the previous continuing calibration.
- The results for acetone in 1 sample and toluene in 13 samples were estimated (J) because the affected analytes were analyzed with an initial calibration curve that exceeded the %RSD criteria and/or the associated multipoint calibration correlation coefficient was less than 0.995.
- The results for acetone in four samples; trimethylbenzene[1,2,4-] and hexanone[2-], isopropylbenzene and isopropyltoluene[4-] in one sample each were estimated (J) because the ICV and/or CCV were recovered outside the method-specific limits.
- The results for 18 SVOCs in 4 samples were estimated (J) because the associated IS area counts showed less than 50% recovery (R) or greater than 200% R when compared to the area counts in the applicable continuing calibration standard.
- The results for acenaphthene in one sample were estimated (J) because the quantitating IS area count was less than 10% of the expected value.
- The results for 18 SVOCs in five samples were estimated (J) because the IS area counts for the quantitating IS were less than 50% but greater than 10% for organics window relation to the previous continuing calibration.
- One result for nitrotoluene[4-] was estimated (J) because the IS retention time has shifted by more than 30 seconds.
- One result for nitroglycerin was estimated (J) because the affected analytes were analyzed with a relative response factor (RRF) of less than 0.05 in the ICV and/or CCV.
- The results for HMX (high-melting explosive [also octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine) in 4 samples, trinitrotoluene[2,4,6-] in one sample; TATB (triaminotrinitrobenzene) in 2 samples;

Aroclor-1260 in 2 samples; and 2 dioxins in 17 samples were estimated (J) because the ICV and/or CCV were recovered outside the method-specific limits.

- The results for Aroclor-1242 in 10 samples, Aroclor-1248 in 3 samples, and Aroclor-1254 in 43 samples were estimated (J) because the multicomponent standards were not analyzed within 72 h of the initial analysis.
- The results for 4 furans in 13 samples were estimated (J) because the analytes identified were greater than 5 times the concentration in the method blank.

The following organic chemical data for soil, tuff, fill, and sediment were qualified as estimated and biased low (J-):

- The results for three VOCs in three samples, seven SVOCs in two samples, and two pesticides in one sample were estimated and biased low (J-) because the surrogates were less than the LAL but greater than or equal to 10% R, which indicates the potential for a low bias in the results.
- The results for 3 VOCs in 1 sample, 15 SVOCs in 5 samples, and 6 high explosives in 3 samples were estimated and biased low (J-) because the extraction/analytical holding times were exceeded by less than 2 times the published method for holding times.
- One result for PETN (pentaerythritol tetranitrate) was estimated and biased low (J-) because the LCS percent recovery was less than the LAL but greater than 10%.
- The results for HMX in 11 samples and RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine) in one sample were estimated and biased low (J-) because the IS used for quantification and its area counts were greater than 130% of the average of that obtained from the calibration standards. The IS area counts must not vary by greater than 70% to 130% from the average of those obtained from the calibration standards or from the midlevel calibration standard.

The following organic chemical data for soil, tuff, fill, and sediment were qualified as estimated and biased high (J+):

- The results for acetone and toluene in one sample each were estimated and biased high (J+) because the surrogate % R values were greater than the UAL, which indicates a potential for a high bias in the results and a potential for false positive results.
- The results for benzo(a)pyrene in 20 samples and benzo(k)fluoranthene in 7 samples were estimated and biased high (J+) because the LCS percent recoveries were greater than the UAL.
- The results for 2 high explosives in 2 samples were estimated and biased high (J+) because the internal standards used for quantification and their area counts were less than 70% but greater than 25% of the average of that obtained from the calibration standards.
- One result for PETN was estimated and biased high (J+) because the contract required detection limit check standard sample did not pass method-acceptance criteria.
- One result for one dioxin was estimated and biased high (J+) because the fortification sample percent recovery was less than 40% but greater than 10%. The laboratory must spike all samples with the sample fortification solution and all sample extracts with recovery standard solution. The recovery acceptance criteria for each compound are 40% to 135%.

The following organic chemical data for soil, tuff, fill, and sediment were qualified as not detected (U):

- The results for 11 VOCs in 340 samples, 1 VOC in 8 samples, 5 furans in 20 samples and 1 dioxin in 1 sample were not detected (U) because the sample results were less than or equal to

5/10 times the concentration of the related analytes in the method blanks, which indicates the reported detections were considered indistinguishable from contamination in the blank.

- The results for 9 VOCs in 109 samples were not detected (U) because the sample results were less than or equal to 5 times the concentration of the related analytes in the trip blanks, rinsate blanks, or equipment blanks, which indicates the reported detections were considered indistinguishable from contamination in the blanks.
- The results for 4 VOCs in 20 samples were not detected (U) because the mass spectrums did not meet specifications.
- The results for one furan in 12 samples were not detected (U) because the column resolution performance was not met.

The following organic chemical data for soil, tuff, fill, and sediment were qualified as estimated and not detected (UJ):

- The reporting limits (RL) for 67 VOCs in 9 samples were estimated and not detected (UJ) because the associated IS area counts were less than 50% but greater than 10% of the previous continuing calibration standard.
- The results for 31 VOCs in 41 samples and 54 SVOCs in 10 samples were estimated and not detected (UJ) because the IS area counts for the quantitating IS were less than 50% but greater than 10% for organics window relation to the previous continuing calibration.
- The results for 43 VOCs in 2 samples and 69 SVOCs in 11 samples were estimated and not detected (UJ) because the surrogates were less than the LAL but greater than or equal 10% R, which indicates the potential for a low bias in the results.
- The results for 23 VOCs in 194 samples, 6 SVOCs in 117 samples, and 6 HEs in 42 samples were estimated and not detected (UJ) because the affected analytes were analyzed with an initial calibration curve that exceeded the %RSD criteria and/or the associated multipoint calibration correlation coefficient was less than 0.995.
- The results for 33 VOCs in 450 samples, 29 SVOCs in 542 samples, 14 HEs in 429 samples and Aroclor-1260 in 14 samples were estimated and not detected (UJ) because the ICV and/or CCV were recovered outside the method-specific limits.
- The results for 62 VOCs in 3 samples, 70 SVOCs in 13 samples and 21 HEs in 25 samples were estimated and not detected (UJ) because the extraction/analytical holding times were exceeded by less than 2 times the published method for holding times.
- The results for 6 VOCs in 39 samples, 3 SVOCs in 95 samples, and 10 HEs in 233 samples were estimated and not detected (UJ) because the LCS percent recoveries were less than 10% the LAL but greater than 10%.
- One RL for benzo(a)anthracene was estimated and not detected (UJ) because the associated IS area counts showed less than 50% R or greater than 200% R when compared with the area counts in the applicable continuing calibration standard.
- The RL for 68 SVOCs in 22 samples were estimated and not detected (UJ) because the associated IS area counts were less than 50% but greater than 10% R when compared with the area counts in the applicable continuing calibration standard.

- The results for 14 SVOCs in 3 samples were estimated and not detected (UJ) because at least 1 surrogate was greater than the UAL and 1 surrogate was less than the LAL, which indicates a greater than normal degree of uncertainty in the result.
- The results for 10 HE in 129 samples were estimated and not detected (UJ) because the MS/matrix spike duplicate (MSD) percent recoveries were greater than 10% but less than 70%.
- The results for 18 HE in 155 samples were estimated and not detected (UJ) because the MS/MSD RPD were greater than 30%.
- The results for 3 HE in 91 samples were estimated and not detected (UJ) because the check standard samples did not pass method-acceptance criteria.
- The results for 15 HE in 104 samples were estimated and not detected (UJ) because the IS used for quantification and its area counts were less than 70% but greater than 25% of the average of that obtained from the calibration standards.
- The results for 17 HE in 107 samples were estimated and not detected (UJ) because the IS used for quantification and their area counts were greater than 130% of the average of that obtained from the calibration standards. The IS area counts must not vary by greater than 70% to 130% from the average of those obtained from the calibration standards or from the mid-level calibration standard.
- The results for 6 HE in 448 samples were estimated and not detected (UJ) because the affected analytes were analyzed with a RRF of less than 0.05 in the ICV and/or CCV.
- One result for one furan was estimated and not detected (UJ) because the sample percent recovery was less than 40% but greater than 10%. The laboratory must spike all samples with the sample fortification solution and all sample extracts with recovery standard solution. The recovery acceptance criteria for each compound are 40% to 135%.
- The RL for 7 PCBs and 19 pesticides was estimated and not detected (UJ) because the associated surrogate was recovered below the LAL but greater than or equal to 10% R.

The following organic chemical data for soil, tuff, fill, and sediment were rejected (R):

- The results for butanone[2-] in 321 samples were rejected (R) because the affected analytes were analyzed with an RRF of less than 0.05 in the ICV and/or CCV.
- The results for 62 VOCs were rejected (R) because the extraction/analytical holding times were exceeded by greater than 2 times the published method for holding times.
- The results for 3 SVOCs and 2 PCBs in 3 samples were rejected (R) because the affected results were not analyzed with a valid 5-point calibration curve and/or a standard at the RL.
- The results for 68 SVOCs in 1 sample were rejected (R) because the required surrogate/tracer information was missing.
- The results for 3 SVOCs and 2 HE in 30 samples in 99 samples were rejected (R) because the LCS percent recoveries were less than 10%.
- The results for 55 SVOCs in 1 sample were rejected (R) because the validator identified quality deficiencies in the reported data that require qualification.
- The results for 16 HE in 70 samples were rejected (R) because the IS retention time has shifted by more than 30 s.

- The results for 3 HEs in 50 samples were rejected (R) because the MS/MSD percent recoveries were less than 10%.
- One result for TATB was rejected (R) because the check standard sample did not pass method-acceptance criteria.
- The results for 3 HE in 22 samples were rejected (R) because the affected analytes were analyzed with a RRF of less than 0.05 in the initial calibration and/or CCV.
- The results for one HE in 47 samples were rejected (R) because the ICV and/or CCV were recovered outside the method-specific limits.
- One result for one furan was rejected (R) because the IS retention time and qualitative criteria for target compound identification were not met.

All organic chemical data, with the exception of rejected data, were used to conduct the risk assessments (Appendix H) and to determine the nature and extent of contamination (Appendix B).

E-5.0 RADIONUCLIDE ANALYSIS SUMMARY

A total of 693 samples (50 field duplicates) were analyzed for radionuclides using the methods listed in Table E-5.0-1.

E-5.1 Radionuclide QA/QC Samples

For each radionuclide, the minimum detected concentration (MDC), preparation and method blanks, laboratory duplicates, tracer/carrier recovery, LCSs, and MS samples were analyzed to assess the accuracy and precision of radionuclide analyses. These QA/QC qualifiers and sample types for radionuclides are defined in the analytical services SOWs (LANL 1995, 049738; LANL 2000, 071233), are described in the applicable SOPs below. Because some of the analyses were performed before the 1995 SOW was implemented, slightly different QA/QC procedures may have been followed. The validation of radionuclide data using QA/QC samples and other methods may have resulted in the rejection of the data or the assignment of various qualifiers to individual sample results.

The MDC for each radionuclide is defined as the minimum activity concentration that the analytical laboratory equipment can detect in 95% of the analyzed samples and is used to assess analytical performance.

Preparation and method blanks are used to measure bias and assess potential cross-contamination of samples during preparation and analysis. Blank results should be less than the MDC for each radionuclide.

Laboratory duplicates are used to assess or demonstrate acceptable laboratory method precision at the time of analysis as well as assess the long-term precision of an analytical method on various matrixes. For radionuclide analyses, duplicate results are used to calculate a duplicate error ratio (DER). The DER is based on 1 standard deviation of the sample and the duplicate sample and should be less than 4.

The LCS serves as a monitor of the overall performance of each step during the analysis, and the acceptance criteria for LCSs are method-specific. For radiochemical methods, LCS percent recovery values should fall into the control limits of 80%–120%.

The accuracy of radionuclide analyses is also assessed using MS samples. These samples are designed to provide information about the effect of the sample matrix on the sample preparation procedures and analytical technique. The MS percent recovery values should be within the acceptance range of 75%–125%; however, if the sample result is more than 4 times the amount of the spike added, these acceptance criteria do not apply.

The following radionuclide data for soil, tuff, fill, and sediment were qualified as estimated (J):

- The results for 3 radionuclides in 43 samples are estimated (J) because the analytes identified were greater than 5 times the concentration in the method blank.
- The results for 3 radionuclides in 53 samples were estimated (J) because the associated duplicate samples had DER or relative error ratio (RER) greater than the analytical laboratory's acceptance limits.

The following radionuclide data for soil, tuff, fill, and sediment were qualified as estimated and biased low (J-):

- The results for three radionuclides in six samples were estimated and biased low (J-) because the tracers were less than the LAL but greater than 10% R.

The following radionuclide data for soil, tuff, fill, and sediment were qualified as estimated and biased high (J+):

- The results for three radionuclides in eight samples were estimated and biased high (J+) because the tracer % R values were greater than the UAL.
- The results for tritium in two samples were estimated and biased high (J+) because the associated matrix spike recoveries were above the UAL.

The following radionuclide data for soil, tuff, fill, and sediment were qualified as not detected (U):

- The results for two radionuclides in three samples were not detected (U) because the sample results were less than or equal to 5 times the concentration of the related analytes in the method blank.
- The results for 14 radionuclides in 639 samples were not detected (U) because the associated sample concentrations were less than or equal to the MDC.
- The results for 14 radionuclides in 245 samples were not detected (U) because the associated sample concentrations were less than 3 times the 1-sigma total propagated uncertainty (TPU).

The following radionuclide data for soil, tuff, fill, and sediment were qualified as estimated and not detected (UJ):

- The results for three radionuclides in eight samples were estimated and not detected (UJ) because the tracers were less than the LAL but greater than or equal to 10% R.
- The results for tritium in 63 samples were estimated and not detected (UJ) because the associated matrix spike recoveries were above the UAL.
- The results for three radionuclides in three samples were estimated and not detected (UJ) because the duplicate samples were not prepared and/or analyzed with the samples for unspecified reasons.

The following radionuclide data for soil, tuff, fill, and sediment were qualified as rejected (R):

- The results for 3 radionuclides in 74 samples were rejected (R) because the spectral interferences prevent positive identification of the analytes.
- The results for uranium-235/236 in five samples were rejected (R) because the associated duplicate samples had DER or RER greater than the analytical laboratory's acceptance limits.

All radionuclide analytical data, with the exception of rejected data, were used to conduct the risk assessments (Appendix H) and to determine the nature and extent of contamination (Appendix B).

E-6.0 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 New Mexico Environment Department 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.

EPA (U.S. Environmental Protection Agency), February 1994. "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review," EPA-540/R-94/013, Office of Emergency and Remedial Response, Washington, D.C. (EPA 1994, 048639)

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ICF Kaiser Engineers, 1995. "Chemical Seepage Pit Sampling Effort Summary," summary prepared for Los Alamos National Laboratory, Los Alamos, New Mexico. (ICF Kaiser Engineers 1995, 062968)

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LANL (Los Alamos National Laboratory), July 1995. "Statement of Work (Formerly Called "Requirements Document") - Analytical Support, (RFP number 9-XS1-Q4257), (Revision 2 - July, 1995)," Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 1995, 049738)

LANL (Los Alamos National Laboratory), January 1996. "Voluntary Corrective Action Completion Report for Potential Release Site 39-007(a), Waste Container Storage Area, Revision 1," Los Alamos National Laboratory document LA-UR-96-445, Los Alamos, New Mexico. (LANL 1996, 053786)

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LANL (Los Alamos National Laboratory), September 1997. "Voluntary Corrective Action Completion Report for Potential Release Site 39-002(a), Storage Area," Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 1997, 056758)

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

LANL (Los Alamos National Laboratory), July 12, 2001. "Notification for a Newly Identified Solid Waste Management Unit (SWMU) at Technical Area (TA)-39," Los Alamos National Laboratory letter (ER2001-0577) to J. Young (NMED-HWB) from J.A. Canepa (ER Program Manager) and M. Johansen (DOE LAAO), Los Alamos, New Mexico. (LANL 2001, 071215)

Table E-3.0-1
Inorganic Chemical Analytical Methods

Analytical Method	Analytical Description	Analytical Suite
SW-846:6010, 6010A, 6010B	Inductively coupled plasma emission spectroscopy-atomic emission spectroscopy	TAL metals: aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, cyanide (total), iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium, thallium, uranium, vanadium, zinc
SW-846: 6020	Inductively coupled plasma mass spectrometry	Aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium, thallium, uranium, vanadium, zinc
EPA Method: 300.0	Ion chromatography	Anions (nitrate)
SW-846: 9010, 9012A	Automated colorimetric/off-line distillation	Cyanide (total)
SW-846: 7470, 7470A, 7471, 7471A	Cold vapor atomic absorption	Mercury
SW-846: 6850	Liquid chromatography-mass spectrometry /mass spectrometry	Perchlorate
Generic: Uranium KPA	Generic: Uranium kinetic phosphorescence analysis	Uranium

Table E-4.0-1
Organic Chemical Analytical Methods

Analytical Method	Analytical Description	Analytical Suite
SW-846:8260, 8260B, 8240	Gas chromatography–mass spectrometry	VOCs
SW-846: 8270, 8270C	Gas chromatography–mass spectrometry	SVOCs
SW-846:8015M Extractable	Gas chromatography	TPH-DRO
SW-846: 8082	Gas chromatography	PCBs
SW-846: 8080	Gas chromatography	Pesticides/PCBs
SW-846: 8330, 8321A_MOD	High performance liquid chromatography	HE
SW-846: 8290	High-resolution gas chromatography/high-resolution mass spectrometry	Dioxins/Furans

Table E-5.0-1
Radionuclide Analytical Methods

Analytical Method	Analytical Description	Analytical Suite
HASL-300: AM-241	Chemical separation alpha spectrometry	Americium-241
HASL-300: ISOPU	Chemical separation alpha spectrometry	Isotopic plutonium
HASL-300: ISOTH	Chemical separation alpha spectrometry	Isotopic thorium
HASL-300: ISOU	Chemical separation alpha spectrometry	Isotopic uranium
EPA Method: 901.1	Gamma spectroscopy	Cesium-134, cesium-137, cobalt-60, europium-152, ruthenium-106, sodium-22
Generic: Gamma Spec	Gamma spectroscopy	Americium-241, cesium-134, cesium-137, cobalt-60, europium-152, ruthenium-106, sodium-22, uranium-235
EPA Method: 906.0	Liquid scintillation	Tritium

Appendix F

Analytical Suites and Results and Analytical Reports
(on DVDs included with this document)

Appendix G

Management of Investigation-Derived Waste

G-1.0 INTRODUCTION

This appendix describes the waste streams generated during the North Ancho investigation and remediation. All waste generated by this project are being managed in accordance procedure ER-ERSS-SOP-5022, "Management of Environmental Restoration Project Waste," which 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 Los Alamos National Laboratory (LANL or the Laboratory) implementation requirements (LIR). In accordance with this procedure, a waste characterization strategy (WCSF) form was prepared for this investigation; a copy of the WCSF is included in Attachment G-1.

The waste streams that were generated during investigation and remediation activities at Solid Waste Management Units (SWMUs) 39-001(a), 39-001(b), and 39-006(a) were managed in three areas of contamination approved by NMED. Attachment G-2 contains copies of the requests for approval, which shows the boundaries of the areas of contamination, and the approval letters from NMED.

The waste streams generated during this project are summarized in Table G-1.0-1 and briefly described below. The documentation available at the time this report was prepared for waste shipped from the site is included in Attachment G-3.

G-2.0 LAYBACK AND OVERBURDEN SOILS

The layback and overburden soils consist of soil and rock removed from above or adjacent to (e.g., from benching to stabilize the trench) the waste disposal pits in SWMUs 39-001(a) and 39-001(b) and the structures removed from SWMU 39-006(a). The soils were stockpiled within the area of contamination for each SWMU and directly sampled. The volume of the layback and overburden soils generated was 1438 yd^3 for SWMU 39-001(a), 4637 yd^3 for SWMU 39-001(b), and 200 yd^3 for SWMU 39-006(a). Analytical results indicated these soils were suitable for reuse as backfill (i.e., contaminant concentrations less than Laboratory background or residential cleanup standards) and they were returned to the bottom of each excavation.

G-3.0 DRILL CUTTINGS

This waste stream consists of 0.5 yd^3 soil and rock cuttings generated from the drilling of boreholes. The drill cuttings were characterized using environmental samples and were determined to be low-level waste (LLW). The soils will be disposed of off-site at the Energy*Solutions* facility in Clive, Utah.

G-4.0 HE TEST KITS

The high explosives (HE) test kits contain a solvent mixed with soil. The solvent/soil mixture is ignitable and is managed as a hazardous waste within the area of contamination. It will be sent for treatment to the Clean Harbors, Painted Desert, Colorado, facility. The remainder of the test kit is nonhazardous and will be disposed of at the Clean Harbors, Colorado, facility.

G-5.0 EXCAVATED SOIL WITH DEBRIS

The soil and debris generated consisted of approximately

- 2194 yd^3 excavated from SWMU 39-001(a),
- 7233 yd^3 excavated from SWMU 39-001(b), and
- 800 yd^3 excavated from SWMU 39-006(a).

The material excavated from SWMUs 39-001(a) and 39-001 (b) consisted primarily of soil mixed with nonhazardous materials (e.g., cable, metal, glass, plastic, and wood). Potentially hazardous debris, unopened containers, two capacitors, and one transfer pump were segregated from the debris and separately characterized.

The two capacitors were excavated from SWMU 39-001(a) and are discussed as a separate waste stream below.

The unopened containers were excavated from SWMU 39-001(b). Two to three containers were sampled by a Laboratory sampler using the entire contents for sampling. The contents of the containers were not hazardous. The empty containers were size reduced on-site and treated as debris. There were additional unopened containers with contents remaining and were disposed of by the Laboratory sampler. A transfer pump was excavated, the drain plug from the pump was not installed, and was verified that the pump did not contain liquid. The transfer pump was characterized as debris and returned to the stockpile.

The material excavated from SWMU 39-006(a) consisted of soil mixed with debris from the septic tank and seepage pit systems.

The soil from each SWMU was separately characterized by direct sampling. Based on the analytical data, the soil from SWMU 39-001(a) was characterized as two separate waste streams: LLW with polychlorinated biphenyls (PCBs) of less than 50 ppm and LLW with PCBs exceeding 50 ppm. The highest PCB result detected was 442 ppm. SWMU 39-001(b) was characterized as LLW with PCB concentrations less than 50 ppm, with the exception of one location. The highest PCBs detected were 50.2 ppm. The waste associated with the highest readings (50.2 ppm and 50 ppm PCBs) will be combined and disposed of. All other results for PCBs and radioactive material were below regulatory limits; therefore, the soil at SWMU 39-006(a) was characterized as industrial LLW with PCBs less than 50 ppm. The LLW soil/debris waste will be disposed of at the Energy*Solutions* facility in Clive, Utah. Industrial waste from SWMU 39-006(a) will be disposed of at an authorized Clean Harbors facility in Painted Desert, Colorado.

G-6.0 CAPACITORS

During the excavation of SWMU 39-001(a), two capacitors were discovered. One capacitor had been punctured and was leaking, and the other capacitor appeared intact but showed signs that oil had leaked from the top of the capacitor. The capacitors were packaged in a single 55-gal. drum and were sent off-site for treatment and disposal at the Clean Harbors facility in Painted Desert, Colorado.

G-7.0 EXCAVATED PCB-CONTAMINATED SOIL

Soil was contaminated during the removal of the capacitors and the results exceeded 500 ppm PCBs. The soil will be disposed of at the Energy*Solutions* facility in Clive, Utah.

G-8.0 SUMMARY OF ANALYTICAL DATA

SWMU	Number of Samples Analyzed	Inorganic (Exceeds SSL)	Organic (Exceeds SSL)	Radionuclides (above BV)	PCBs (>1 mg/kg)
39-006(a)	48	0	1 (RE39-09-5822)	3 (RE39-09-5842, 6918, and 6919)	0
39-001(a)	34	0	0	12 (RE39-09-3294, 3298, 3301-06, 3308, 3316, 3320, and 3322)	5 (RE39-09-3295-97, and 3299-3300)
39-001(b)	92	8	0	27 (RE39-09-3100, 3108-10, 13118- 20, 3124, 3129-31, 3133, 3135-36, 3140-41, 3143, 3147, 3152-53, 3172, 3176-78, 3180, and 3182-83)	1 (RE39-09-3118)
TOTAL	**174**	**8**	**1**	**42**	**6**

Table G-1.0-1
Generation and Management of the
Investigation-Derived Waste for North Ancho Canyon Aggregate Area

Waste Stream	Waste Type	Volume or Weight	Storage Method	Final Disposition
Layback/Overburden	Not applicable	6275 total yd^3 for 3 units	Stockpiled	Backfill
Drill Cuttings	LLW	Less than 0.5 yd^3	Bucket	Energy*Solutions* facility in Clive, Utah
Contact Waste	LLW	Less than 2 yd^3	Poly drums	Clean Harbors, Painted Desert, Colorado
HE Test Kits	Mixed LLW Hazardous Waste Industrial Waste	Less than 2 yd^3	Steel and poly drums	Clean Harbors, Painted Desert, Colorado
Excavated Soil with Debris	LLW <50 ppm PCB	9300 yd^3	Stockpiles	Energy*Solutions* Facility in Clive, Utah
	LLW >50 ppm PCB	28066 yd^3	Stockpiles	Energy*Solutions* Facility in Clive, Utah
	Industrial Waste	200 yd^3	Rolloff bins	Clean Harbors, Painted Desert, Colorado
Excavated Soils (No Debris)	LLW $\geq$ 500 ppm PCB	2006 yd^3	Stockpiles	Energy*Solutions* Facility in Clive, Utah
Capacitors	>1000 ppm PCB	9 ft^3	55-gal. drum with absorbent	Clean Harbors, Painted Desert, Colorado

Attachment G-1

Waste Characterization Strategy Form

Waste Characterization Strategy Form

Project Title	**North Ancho Canyon Aggregate Area Investigation Revision 1**
Solid Waste Management Unit or Area of Concern #	**SWMUs 39-002(a), 39-005, 39-006(a), 39-007(a) ,39-010, 39-004(c), 39-004(d), and 39-008, and AOCs 39-002(b),39-002(c),39-002(f),39-007(d)**
Activity Type	**Nature and extent of potential contamination at these sites and to excavate waste and soil.**
Field Team Leader	**Darrel Blain**
Field Waste Management Coordinator	**Ron DeSotel**
Completed by	**Ron DeSotel**
Date	**1/28/2009**

Description of Activity: The purpose of this investigation is to determine the nature and extent of potential contamination at solid waste management units (SWMUs) and areas of concern (AOCs) located within North Ancho Canyon and to excavate waste and soil previously investigated with post-excavation confirmation sampling.
The investigation work plan EP2007-0762 describes investigation and cleanup activities to be implemented to meet requirements of the Consent Order (NMED 2006, 093017) for the North Ancho Canyon Aggregate Area. Detailed site descriptions, potential contaminants, operations, and historical investigations for each SWMU and AOC are included in the associated historical investigation report for North Ancho Canyon Aggregate Area," Los Alamos National Laboratory document LA-UR-07-5948, Los Alamos, New Mexico. (LANL 2007, 098281)

This WCSF describes the management of investigation-derived waste (IDW) and cleanup wastes generated during the investigation and remediation of sites comprising the North Ancho Canyon Aggregate Area at Los Alamos National Laboratory (LANL or the Laboratory). This waste is generated during field-investigation activities and it may include, but is not limited to, drill cuttings; contaminated soil; contaminated personal protective equipment (PPE), sampling supplies, and plastic; fluids from the decontamination of PPE and sampling equipment; and all other waste that has potentially come into contact with contaminants. In addition, IDW includes remediation waste generated during removal actions planned in conjunction with site characterization. This remediation waste includes, but is not limited to, septic tank structures and drain lines, underground storage tanks, excavated debris, contaminated soil, asphalt, and sludge.

Relevant Site History and Description: North Ancho Canyon consists primarily of firing sites used for testing high explosives, support facilities, and waste disposal areas. Active facilities include firing sites, storage areas, administrative offices, workshops, sewage disposal facilities, and supporting infrastructure. Inactive facilities include firing sites, storage areas, waste disposal areas, and sewage and chemical disposal facilities. Cleanup at some SWMUs and AOCs has been completed. The North Ancho Canyon Aggregate Area consists of 26 individual SWMUs and AOCs in Technical Area 39. The following sites are proposed for characterization and or cleanup:

Nine sites [SWMUs 39-002(a), 39-005, 39-006(a) (active components), 39-007(a), 39-010 and AOCs 39-002(b), 39-002(c), 39-002(f), and 39-007(d)] are proposed for characterization. Three sites [SWMUs 39-001(a), 39-001(b), and 39-006(a) inactive components] are proposed for cleanup under the investigation work plan. Cleanup levels proposed for the excavation sites are presented in the work plan and are based on industrial SSLs from NMED, EPA Region 9, EPA Region 6, or screening action levels from the Laboratory.

CHARACTERIZATION STRATEGY

This WCSF identifies the types of wastes expected, based on the data for previous investigations; however, other types of wastes may be encountered. All wastes will be managed in secure, designated areas appropriate to the type of the waste. Waste accumulation area postings, regulated storage duration, and inspection requirements will be based on the type waste and its regulatory classification. The selection of waste containers will be based on U.S. Department of Transportation requirements, waste types, and estimated volumes of IDW to be generated. Immediately following containerization, each waste container will be individually labeled with a unique identification number and with information regarding waste classification, contents, radioactivity, and date generated. IDW characterization will be completed through review of sampling data and/or documentation, or by direct sampling of the IDW or the media being investigated. If analyses indicate the presence of listed constituents that are not identified from historical processes, a due diligence may be performed to support the position that the constituents are not from a known process, spill or disposal event and therefore the waste will not carry the waste code. If a listed constituent is identified and is from a known process but the levels are below screening levels and LDRs, a Contained-In request may be made to NMED in order to drop the listed code from the waste stream. A copy of either the ENV-RCRA approved due diligence or the NMED contained-in approval must accompany all waste profiles prepared for the subject waste(s).
Data currently available for the aggregate area do not identify polychlorinated biphenyl (PCB) concentrations greater than 1 mg/kg. However, if this investigation identifies PCB concentrations between 1 and 50 mg/kg, the Laboratory may submit a request to EPA (with a copy to NMED) to handle the waste as PCB remediation waste.

Investigation activities will be conducted in a manner that minimizes the generation of waste. Waste minimization will be accomplished by implementing the most recent version of the "Los Alamos National Laboratory Hazardous Waste Minimization Report" (LANL, 2007). Waste streams will be recycled/reused, as appropriate.

Considerable amounts of material will be excavated during the remediation of Solid Waste Management Units (SWMUs) 39-001(a), 39-001(b), and 39-006(a). To facilitate the staging and segregation of the remediation waste, the Laboratory will submit an area of contamination (AOC) designation request for these three SWMUs to the NMED for approval. The request will specify the boundaries of the proposed AOCs and describe the activities to be conducted within the AOC.

Waste #1: Layback and Overburden Soils - The layback and overburden soils (referred to as spoil in the work plan), will consist of soil and rock removed from above or adjacent to (e.g., from benching to stabilize the trench) the SWMUs that are to be excavated. The volume of soils generated is estimated to be 3400 yd^3 but may increase or decrease based on how much benching of the trenches is required.

Anticipated Regulatory Status: Industrial, Low-Level.

Characterization Approach: As the soils are excavated, the soils will be screened for radioactive, volatile organic compounds. Based on the screening results, the excavated soils will be segregated and stored either in roll off bins or other suitable containers, or on the ground surfaces with appropriate storm water best management practices. A minimum of one composite sample shall be collected per every 20 yd^3 of stockpiled soils .If soils are containerized, One composite sample shall be collected per container. If process knowledge, odors, or staining indicate that the soils may be contaminated with petroleum products, the materials will also be analyzed for total petroleum hydrocarbons (TPH).

Storage and Disposal Method: Soils will be stored either in roll off bins, suitable containers, or on the ground surface with appropriate storm water best management practices (BMP's). The soils will remain

within the AOC boundary of the SWMU from which they were excavated, awaiting analytical results. If the soils are determined to be suitable for reuse (i.e., contaminate concentrations are less than LANL background, or residential cleanup standards as determined using NMED's and DOE's soil screening guidance), LANL will use this material to backfill the excavated SWMUs. If the soils do not meet background or residential cleanup standards, they will be transported for treatment/disposal at an authorized off site facility appropriate for the waste regulatory classification. Based on existing data, the Laboratory expects soils that cannot be reused to be designated as industrial waste or LLW. The LLW will be disposed of at TA-54, Area G or an authorized off-site radioactive waste facility. Industrial waste will be disposed of at an authorized off-site industrial waste landfill.

Waste # 2: Drill Cuttings (IDW) - This waste stream consists of soil and rock cuttings generated from the drilling of boreholes. Cuttings may or may not contain residues of drilling additives (drilling mud or foam) used to promote borehole integrity. The approximate volume of waste generated is estimated to be less than 2 yd^3.

Anticipated Regulatory Status: Radioactive, Solid, Hazardous, Mixed (hazardous and radioactive), TSCA, New Mexico Special Waste, Industrial, or combinations.

Characterization Approach: The drill cuttings will be characterized using the analytical results from the direct push core sample. The following analyses will be performed: VOC, SVOCs, radionuclide's, TAL metals, cyanide, nitrates, HE, perchlorates, PCBs, and toxicity characteristic metals. If process knowledge, odors, or staining indicate that the cuttings may be contaminated with petroleum products, the materials will also be analyzed for TPH. MSDS may be used to characterize drilling additives (drilling mud or foam).

Storage and Disposal Method: Drill cuttings will be containerized in 55-gal. drums, B-12 containers, or other appropriate containers at the point of generation. Drill cuttings generated from SWMU 39-005 (SWMU 39-005 is not within the AOC boundaries) will be stored in a registered hazardous waste storage area, or accumulation area.

The cuttings may be land applied if they meet the criteria in the NMED-approved Notice of Intent (NOI) Decision Tree for Land Application of Investigation Derived Waste Solids from Construction of Wells and Boreholes. If they cannot be land applied, they will be transported for treatment/disposal at an authorized off site facility. Based on existing data, the Laboratory expects drill cuttings that cannot be land applied to be designated as industrial waste or LLW.

Waste #3: Excavated Debris from SWMUs 39-001(a) and 39-001(b) Disposal Areas-
This waste stream will consist of all waste material removed from within these disposal areas. Due to the uncertainty about the types of material that could be encountered within the trenches, a description of each is not possible; however, examples of wastes that may be encountered are, aerosol cans, wiring, shot stands, metals, batteries, empty containers, containers with unknown contents, equipment, cardboard, paper, plastic, and similar office and firing site debris. If un-containerized liquids are found, they will be managed under Waste Stream #10. If containerized liquids are encountered, they will be segregated and characterized individually. While disposal of intact pieces of HE or propellant or other highly hazardous materials are not expected, work will be suspended if they are encountered until safety personnel address worker safety issues. Debris will contain less than 1% associated soil. The volume of waste generated is estimated to be 6800 yd^3.

***Anticipated Regulatory Status*:** Radioactive, Solid, Hazardous, Mixed (hazardous and radioactive), TSCA, New Mexico Special Waste, Industrial, Universal.

Characterization Approach: Because much of the material is debris, which is difficult to characterize, acceptable knowledge of firing site operations and of the waste materials themselves (e.g., batteries, wiring, etc.) will be used to the extent possible to initially characterize wastes. If sampling is required, a statistical approach, as suggested by EPA guidance on waste sampling, will be used to collect

representative samples. If suspect asbestos-containing materials are encountered, they will be sampled and managed by authorized personnel. All man-made debris will be managed as waste.

Storage and Disposal Method: Because of the expected variability in this waste stream, wastes will be managed on a case-by-case basis within the boundaries of the AOC of each SWMU. As it is excavated, the waste will be screened for radioactive, volatile organic compounds. Based on the screening results, the excavated wastes will be segregated and stored either in roll off bins, other suitable containers, or on the ground surface with appropriate storm water best management practices. Liquids will be containerized.

Most waste will likely be industrial waste or LLW. However, New Mexico Special Waste (NMSW), LLW, hazardous waste, and PCB-contaminated waste may be encountered. The wastes will be sent to an authorized on-site or off-site treatment or disposal facilities, as appropriate to the waste regulatory classification.

Waste #4: Excavated Waste from SWMU 39-006(a) Septic System- This waste stream will consist of septic system components (e.g., piping, concrete reinforced with steel rebar, sludge). If liquids are found, they will be managed under Waste Stream #10. The volume of waste generated is estimated to be 800 yd^3. Debris will contain less than 1% associated soil.

***Anticipated Regulatory Status*:** Radioactive, Solid, Hazardous, Mixed (hazardous and radioactive), TSCA, New Mexico Special Waste, Industrial, Universal, or combinations.

Characterization Approach: Waste determinations for the debris will be based on data from the tanks contents or contaminated soil, if appropriate. The debris may be directly analyzed if it lends itself to size reduction (e.g., concrete or clay piping). The waste will be analyzed for volatile organic compounds VOC, SVOCs, radionuclide's, TAL metals, HE, PCBs, and toxicity characteristic metals.

Storage and Disposal Method: As this waste is excavated, the waste will be screened for radioactive, volatile organic compounds. Based on the screening results, the excavated wastes will be segregated and stored either in roll off bins or other suitable containers, or on the ground surfaces with appropriate storm water best management practices. Liquids will be containerized and managed per waste #10.

Waste determinations for the debris will be based on data from the tanks contents or contaminated soil, if appropriate. Based on existing data and process information, the waste is expected to be industrial waste or hazardous waste, which will be treated/disposed at off-site authorized facilities.

Waste # 5: Contact Waste - The contact waste stream includes spent personal protective equipment, contaminated sampling supplies, dry decontamination waste that may have come in contact with contaminated media, plastic used to segregate debris and maintain stockpiles. The volume of waste generated is estimated to be less than 5 yd^3.

Anticipated Regulatory Status: Radioactive, Solid, Hazardous, Mixed (hazardous and radioactive), TSCA, New Mexico Special Waste, Industrial, or combinations.

Characterization Approach: Characterization of the waste will be conducted using AK of the waste material, the extent of contamination of the contact waste, the methods of generation, as well as analytical data available for the media with which it came in contact.

Storage and Disposal Method: Contact waste will be stored in plastic lined 30-gal. or 55-gal. drums, roll-off bins or other appropriate containers. This waste stream will be treated/disposed in an authorized facility appropriate for the waste regulatory classification.

Waste # 6: Decontamination Fluids - The decontamination fluids waste stream will consist of liquid wastes from decontamination activities (e.g., decontamination solutions and rinse waters). Consistent with waste minimization practices, the Laboratory employs dry decontamination methods to the extent possible. If dry decontamination cannot be performed, liquid decontamination wastes will be collected in containers at the point of generation. The approximate volume of waste generated is estimated to be less than 100 gallons.

Anticipated Regulatory Status: Radioactive, Solid, Hazardous, Mixed (hazardous and radioactive), TSCA, New Mexico Special Waste, Industrial, or combinations.

Characterization Approach: The decontamination fluids will be characterized using AK of the waste materials and analytical results from the media with which it came in contact, augmented by direct sampling of the containerized waste, if needed, and MSDS for any absorbent used

Storage and Disposal Method: Decontamination fluids will be collected in containers at the point of generation. LLW will be treated at the Radioactive Liquid Waste Treatment Facility (RLWTF) at TA-50. If the waste does not meet the waste acceptance criteria for the RLWTF, it may be treated or disposed at another on-site facility (e.g., Sanitary Waste System) or at an authorized off-site facility. If solidification of decontamination fluids is required for transportation or disposal, it may be solidified using an approved absorbent such as Waste-Lock 770 within an authorized storage, treatment, area.

Waste #7: HE / PCB Test Kits - Test kits for HE & PCB sample screening includes a solvent (methanol and acetone). The approximate volume of waste generated is estimated to be less than <1 gallon.

Anticipated Regulatory Status: Hazardous, LLW, Municipal, or Industrial

Characterization Approach: The waste will be characterized based on acceptable knowledge of the type of solvent used and the analytical results for the environmental media that it contacted.

Storage and Disposal Method: Spent solvent will be containerized and stored in a hazardous waste accumulation area. After a waste determination is complete, the spent solvent will be sent to an off-site authorized hazardous waste treatment facility. The remainder of the kits is non-hazardous and will be disposed at an off-site municipal or industrial waste landfill.

Waste #8: Municipal Solid Waste (MSW) – This waste stream primarily consists of non contact trash including but not limited to paper, cardboard, wood, plastic, food and beverage containers, empty solution containers, but may also include commercial solid waste, and industrial solid waste or petroleum contaminated soils that are not a special waste, which are derived from project activities . It is estimated to be 1 yd^3 of MSW will be generated.

Anticipated Regulatory Status: Non-hazardous, non-radioactive, municipal solid waste

Characterization Approach: MSW will be characterized based on acceptable knowledge or if necessary direct sampling of containerized waste.

Management and Disposal Method: MSW will be segregated from all other waste streams and managed in approved containers. It is anticipated that the waste will be stored in plastic trash bags or other appropriate containers and disposed of at the County of Los Alamos Landfill or other authorized facility.

Waste #9: New Mexico Special Waste (NMSW): Petroleum Contaminated Soils (PCS), Spilled Chemical Substance or Commercial Product, or Regulated Asbestos Waste (potential) - NMSW may be generated from the accidental release of commercial products such as hydraulic fluid, motor oil, unleaded gasoline, or diesel fuel (e.g. from the rupture of hydraulic or fuel hoses, or spills during maintenance etc.), spills of chemicals or products used during project operations (e.g. drilling fluid additives), onto the ground, or regulated asbestos wastes generated during project activities. This may also include absorbent padding, paper towels, spill pillows or other absorbent material used to contain the released. It is estimated to be 1 yd^3 of waste will be generated.

Anticipated Regulatory Status: New Mexico Special Waste

Characterization Approach: NMSW will be characterized based on acceptable knowledge using the MSDS and/or direct sampling. PCS will be sampled and analyzed for TPH (DRO/GRO), and total lead.

Management and Disposal Method: NMSW will be managed in approved containers, staged in a designated NMSW storage area, and disposed of at an authorized NMSW facility.

Waste #10 – Un-Containerized Liquids (IDW) - This waste stream consists of un-containerized liquids encountered during the excavation and remediation of Solid Waste Management Units (SWMUs) 39-001(a), 39-001(b), and 39-006(a). The estimated volume of liquids that may be generated will be between 50 and 500 gallons.

***Anticipated Regulatory Status*:** Radioactive, Solid, Hazardous, Mixed (hazardous and radioactive), TSCA, New Mexico Special Waste, Industrial.

Characterization Approach: Waste characterization will be based upon the analytical results obtained from the direct sampling of the containerized liquids, and MSDS for any absorbent used.

Storage and Disposal Method: Liquids will be collected in containers at the point of generation and managed within the boundaries of the AOC of each SWMU. LLW will be treated at the Radioactive Liquid Waste Treatment Facility (RLWTF) at TA-50. If the waste does not meet the waste acceptance criteria for the RLWTF, it may be treated or disposed at another on-site facility (e.g., Sanitary Waste System) or at an authorized off-site facility. If solidification of decontamination fluids is required for transportation or disposal, it may be solidified using an approved absorbent such as Waste-Lock 770 within an authorized storage, treatment, area.

Waste #11: Excavated Soils with Debris - The Excavated Soils with Debris will consist of soil, rock, that is mixed with debris generated from one or all of the three SWMUs that are to be excavated. Soils with debris will be segregated; soils will have less than 1% debris, debris will be managed under Waste Stream #4. The volume of soils with debris generated is estimated to be 1000 yd^3.

Anticipated Regulatory Status: Radioactive, Solid, Hazardous, Mixed (hazardous and radioactive), TSCA, New Mexico Special Waste, Industrial.

Characterization Approach Samples of the soils will be collected and composited. A minimum of one composite sample shall be collected per every 20 yd^3 of stockpiled soils .If soils are containerized, One composite sample shall be collected per container. Soils will be screened for radioactive and volatile organic contaminants. If process knowledge, odors, or staining indicate that the soils may be contaminated with petroleum products, the materials will also be analyzed for total petroleum hydrocarbons (TPH).

Storage and Disposal Method: Based on the screening results, the soils with debris will be segregated and stored either in roll off bins, suitable containers, or on the ground surface with appropriate storm water best management practices (BMP's). The material will remain within the AOC boundary of the SWMU from which they were excavated, awaiting analytical results.

Most waste will likely be industrial waste or LLW. However, New Mexico Special Waste (NMSW), LLW, hazardous waste, and PCB-contaminated waste may be encountered. The wastes will be sent to an authorized on-site or off-site treatment or disposal facilities, as appropriate to the waste regulatory classification.

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CHARACTERIZATION TABLE

Waste Description	Waste # 1 layback and Overburden Spoils	Waste #2 Drill Cuttings	Waste #3 Excavated Waste / SWMU's 39-001 (a), (b)	Waste #4 Excavated Waste / SWMU 39-006 (a)
Volume (estimated)	3400 cy	< 2 cy	6800 cy	800 cy
Packaging	Stockpile/Containers	Containers	Stockpile/Containers	Stockpile/Containers
Regulatory classification:				
Radioactive	X	X	X	X
Municipal			X	X
Hazardous	X	X	X	X
Mixed (hazardous and radioactive)	X	X	X	X
Toxic Substances Control Act (TSCA)	X	X	X	X
New Mexico Special Waste	X	X	X	X
Industrial	X	X	X	X
Liquid			X	X
Characterization Method				
Acceptable knowledge (AK) Existing Data/Documentation			X	X
AK: Site Characterization	X	X		
Direct Sampling of Containerized Waste	X		X(as needed)	X(as needed)
Analytical Testing				
Volatile Organic Compounds (EPA 8260-B)	X		X	X
Semivolatile Organic Compounds (EPA 8270-C)	X		X	X
Organic Pesticides (EPA 8081-A)	X		X	X
Organic Herbicides (EPA 8151-A)	X		X	X
PCBs (EPA 8082)	X		X	X
Total Metals (EPA 6010-B/7471-A)	X		X	X
Total Cyanide (EPA 9012-A)	X		X	X
High Explosives Constituents (EPA 8330/8321-A)	X		X	X
Asbestos			X (as needed)	X (as needed)
Total petroleum hydrocarbon (TPH)-GRO (EPA 8015-M)	X(as needed)		X (as needed)	X(as needed)
TPH-DRO (EPA 8015-M)	X(as needed)		X (as needed)	X(as needed)
Toxicity characteristic leaching procedure (TCLP) Metals (EPA 1311/6010-B)	X		X	X
TCLP Organics (EPA 1311/8260-B & 1311/8270-C)	X		X	X
TCLP Pest. & Herb. (EPA 1311/8081-A/1311/8151-A)	X		X	X
Gross Alpha (alpha counting) (EPA 900)	X		X	X
Gross Beta (beta counting) (EPA 900)	X		X	X
Tritium (liquid scintillation) (EPA 906.0)	X		X	X
Gamma spectroscopy (EPA 901.1)	X		X	X
Isotopic plutonium (chem. separation/alpha spec.) (HASL-300)	X		X	X
Isotopic uranium (chem. separation/alpha spec.) (HASL-300)	X		X	X
Total uranium (6020 inductively coupled plasma mass spectroscopy [ICPMS])	X		X	X
Strontium-90 (EPA 905)	X		X	X
Americium-241 (chem. separation/alpha spec.) (HASL-300)	X		X	X
Perchlorates	X		X	X
Nitrates	X		X	X
WPF	TBD	TBD	TBD	TBD

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CHARACTERIZATION TABLE CONT.

Waste Description	Waste #5 Contact Waste	Waste #6 Decontamination Fluids	Waste #7 HE / PCB Test Kits	Waste #8 Municipal Solid Waste	Waste #9 New Mexico Special Waste
Volume	5 cy	< 100 gallons	< 1 gallon	1 cy	< 1 cy
Packaging	Containers	Containers	Containers	Containers	Containers
Regulatory classification:					
Radioactive	X	X	X		
Municipal				X	
Hazardous	X	X	X		
Mixed (hazardous and radioactive)	X	X	X		
Toxic Substances Control Act (TSCA)	X	X	X		
New Mexico Special Waste		X			X
Industrial	X	X			
Liquid		X			
Characterization Method					
Acceptable Knowledge (AK) Existing Data/Documentation	X	X	X	X	X
AK Site Characterization	X		X	X	
Direct Sampling of Containerized Waste		X(as needed)			X
Analytical Testing					
Volatile Organic Compounds (EPA 8260-B)		X			X
Semivolatile Organic Compounds (EPA 8270-C)		X			
Organic Pesticides (EPA 8081-A)		X			X
Organic Herbicides (EPA 8151-A)		X			X
PCBs (EPA 8082)		X			X
Total Metals (EPA 6010-B/7471-A)		X			X
Total Cyanide (EPA 9012-A)		X			X
High Explosives Constituents (EPA 8330/8321-A)		X			X
Asbestos					X(as needed)
Total petroleum hydrocarbon (TPH)-GRO (EPA 8015-M)		X(as needed)			X
TPH-DRO (EPA 8015-M)		X(as needed)			X
Toxicity characteristic leaching procedure (TCLP) Metals (EPA 1311/6010-B)		X			X
TCLP Organics (EPA 1311/8260-B & 1311/8270-C)		X			X
TCLP Pest. & Herb. (EPA 1311/8081-A/1311/8151-A)		X			X
Gross Alpha (alpha counting) (EPA 900)		X			X
Gross Beta (beta counting) (EPA 900)		X			X
Tritium (liquid scintillation) (EPA 906.0)		X			X
Gamma spectroscopy (EPA 901.1)					X
Isotopic plutonium (chem. separation/alpha spec.) (HASL-300)		X			X
Isotopic uranium (chem. separation/alpha spec.) (HASL 300)		X			X
Total uranium (6020 inductively coupled plasma mass spectroscopy [ICPMS])		X			X
Strontium-90 (EPA 905)		X			X
Americium-241 (chem. separation/alpha spec.) (HASL-300)		X			X
Perchlorates		X			X
Nitrates		X			X
COD/ TSS /MICROTOX		X			
WPF	TBD	TBD	TBD	TBD	TBD

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CHARACTERIZATION TABLE CONT.

Waste Description	Waste #10 Un-Containerized Liquids	Waste #11 Excavated Soils w/ Debris
Volume	50-500 gal	6800 cy
Packaging	Containers	Stockpile/Containers
Regulatory classification:		
Radioactive	X	X
Municipal		X
Hazardous	X	X
Mixed (hazardous and radioactive)	X	X
Toxic Substances Control Act (TSCA)	X	X
New Mexico Special Waste	X	X
Industrial	X	X
Liquid	X	
Characterization Method		
Acceptable knowledge (AK): Existing Data/Documentation	X	X
AK: Site Characterization		
Direct Sampling of Containerized Waste	X(as needed)	X(as needed)
Analytical Testing		
Volatile Organic Compounds (EPA 8260-B)	X	X
Semivolatile Organic Compounds (EPA 8270-C)	X	X
Organic Pesticides (EPA 8081-A)	X	X
Organic Herbicides (EPA 8151-A)	X	X
PCBs (EPA 8082)	X	X
Total Metals (EPA 6010-B/7471-A)	X	X
Total Cyanide (EPA 9012-A)	X	X
High Explosives Constituents (EPA 8330/8321-A)	X	X
Asbestos		
Total petroleum hydrocarbon (TPH)-GRO (EPA 8015-M)	X(as needed)	X (as needed)
TPH-DRO (EPA 8015-M)	X(as needed)	X (as needed)
Toxicity characteristic leaching procedure (TCLP) Metals (EPA 1311/6010-B)	X	X
TCLP Organics (EPA 1311/8260-B & 1311/8270-C)	X	X
TCLP Pest. & Herb. (EPA 1311/8081-A/1311/8151-A)	X	X
Gross Alpha (alpha counting) (EPA 900)	X	X
Gross Beta (beta counting) (EPA 900)	X	X
Tritium (liquid scintillation) (EPA 906.0)	X	X
Gamma spectroscopy (EPA 901.1)		X
Isotopic plutonium (chem. separation/alpha spec.) (HASL-300)	X	X
Isotopic uranium (chem. separation/alpha spec.) (HASL-300)	X	X
Total uranium (6020 inductively coupled plasma mass spectroscopy [ICPMS])	X	X
Strontium-90 (EPA 905)	X	X
Americium-241 (chem. separation/alpha spec.) (HASL-	X	X
Perchlorates	X	X
Nitrates	X	X
COD/TSS /MICROTOX	X	
WPF	TBD	TBD

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Note: Section 1.2 of the TCLP method 1311 states "If a total analysis of the waste demonstrates that individual analytes are not present in the waste, or that they are present but at such low concentrations that the appropriate regulatory levels could not possibly be exceeded, the TCLP need not be run." The methodology for using total waste analyses determination for the 40 TC constituents is as follows;

Liquids – Wastes containing less than 0.5% filterable solids do not require extraction and therefore by filtering the waste and measuring the total constituent levels of the filtrate and comparing those levels to regulatory levels is appropriate.

Solids – Constituent concentrations from the extraction fluid of wastes that are 100% physical solids are divided by 20 (reflecting the 20 to 1 ratio of TCLP extraction) and then compared to the regulatory levels. If the theoretical levels do not equal or exceed the regulatory levels, the TCLP need not be run. If the levels do equal or exceed the regulatory levels, the generator may either declare the waste hazardous or run TCLP analyses.

References

ER-ERSS-SOP-5022, *Management of Environmental Restoration Project Waste.*

Work Plan EP2007-0762

Los Alamos National Laboratory document LA-UR-07-5948, Los Alamos, New Mexico. (LANL 2007, 098281)

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Waste Characterization Strategy Form (continued)

Signatures	Date
Project Leader (Print name and then sign below.) John McCann	3-4-09
WES Waste Management Coordinator (Print name and then sign below.) Gordon Jio	2/26/09
ENV-RCRA Representative (Print name and then sign below.) John Tymkowych or Ann Sherrard	3/2/09
WES-WA Representative (Print name and then sign below.) Andy U. Elicio	3/04/09

	Los Alamos National Laboratory

Amendment # 1 to the
Waste Characterization Strategy Form (WCSF)
for North Ancho Canyon Agg Area, Revision 1, EP2009-0054 (Dated February 2009)

Date: July 10, 2009

INTRODUCTION – This amendment to WCSF EP2009-0054 is to address the characterization approach for capacitors under Waste Stream #3.
BACKGROUND – During the excavation of SWMU 39-001(a), 2 large capacitors were found. The capacitors were segregated and the oil from one of the capacitors was sampled for Aroclors.
WASTE DESCRIPTION – PCB capacitors containing oil.
REGULATORY STATUS, CHARACTERIZATION, MANAGEMENT, AND DISPOSAL (CHANGES) **Waste #3: Excavated Debris from SWMUs 39-001(a) and 39-001(b) Disposal Areas-** *ANTICIPATED REGULATORY STATUS:* No Changes *CHARACTERIZATION APPROACH:* Capacitors will be characterized using AK and the direct sampling of the oil for Aroclors. *STORAGE AND DISPOSAL METHOD:* No Changes

Signatures	**Date**
Project Leader (Sign below.) John McCann	7-13-09
WES Waste Management Coordinator (Sign below.) Gordon Jio	7/13/2009
ENV-RCRA Representative (Sign below.) Ann Sherrard	7/13/2009
WES-WA Representative (Sign below.) Andy Elicio	07/13/09
Los Alamos National Laboratory **ENV-ERSS**	

North Ancho Canyon Aggregate Area Investigation

CHARACTERIZATION TABLE

Waste Description	Waste # 1 layback and Overburden Spoils	Waste #2 Drill Cuttings	Waste #3 Excavated Waste / SWMU's 39-001 (a), (b)	Waste #4 Excavated Waste / SWMU 39-006(a)
Volume (estimated)	3400 cy	< 2 cy	6800 cy	800 cy
Packaging	Stockpile/Containers	Containers	Stockpile/Containers	Stockpile/Containers
Regulatory classification:				
Radioactive	X	X	X	X
Municipal			X	X
Hazardous	X	X	X	X
Mixed (hazardous and radioactive)	X	X	X	X
Toxic Substances Control Act (TSCA)	X	X	X	X
New Mexico Special Waste	X	X	X	X
Industrial	X	X	X	X
Liquid			X	X
Characterization Method				
Acceptable knowledge (AK): Existing Data/Documentation			X	X
AK: Site Characterization	X	X		
Direct Sampling of Containerized Waste	X		X(as needed)	X(as needed)
Analytical Testing				
Volatile Organic Compounds (EPA 8260-B)	X		X	X
Semivolatile Organic Compounds (EPA 8270-C)	X		X	X
Organic Pesticides (EPA 8081-A)	X		X	X
Organic Herbicides (EPA 8151-A)	X		X	X
PCBs (EPA 8082)	X		X (Req. for Capacitors)	X
Total Metals (EPA 6010-B/7471-A)	X		X	X
Total Cyanide (EPA 9012-A)	X		X	X
High Explosives Constituents (EPA 8330/8321-A)	X		X	X
Asbestos			X (as needed)	X (as needed)
Total petroleum hydrocarbon (TPH)-GRO (EPA 8015-M)	X(as needed)		X (as needed)	X(as needed)
TPH-DRO (EPA 8015-M)	X(as needed)		X (as needed)	X(as needed)
Toxicity characteristic leaching procedure (TCLP) Metals (EPA 1311/6010-B)	X		X	X
TCLP Organics (EPA 1311/8260-B & 1311/8270-C)	X		X	X
TCLP Pest. & Herb. (EPA 1311/8081-A/1311/8151-A)	X		X	X
Gross Alpha (alpha counting) (EPA 900)	X		X	X
Gross Beta (beta counting) (EPA 900)	X		X	X
Tritium (liquid scintillation) (EPA 906.0)	X		X	X
Gamma spectroscopy (EPA 901.1)	X		X	X
Isotopic plutonium (chem. separation/alpha spec.) (HASL-300)	X		X	X
Isotopic uranium (chem. separation/alpha spec.) (HASL-300)	X		X	X
Total uranium (6020 inductively coupled plasma mass spectroscopy [ICPMS])	X		X	X
Strontium-90 (EPA 905)	X		X	X
Americium-241 (chem. separation/alpha spec.) (HASL-300)	X		X	X
Perchlorates	X		X	X
Nitrates	X		X	X
WPF	TBD	TBD	TBD	TBD

eer Review Draft: WCSF North Ancho Canyon Agg Area, Revision 1
P2009-0054

Page 7 of 10
February 2009

Attachment G-2

Requests for Approval and Approval Letters

Los Alamos
NATIONAL LABORATORY
EST. 1943
Environmental Programs
P.O. Box 1663, MS M991
Los Alamos, New Mexico 87545
(505) 606-2337/FAX (505) 665-1812

National Nuclear Security Administration
Los Alamos Site Office, MS A316
Environmental Restoration Program
Los Alamos, New Mexico 87544
(505) 667-4255/FAX (505) 606-2132

Date: December 12, 2008
Refer To: EP2008-0625

James P. Bearzi, Bureau Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

Subject: Submittal of Request for Approval of Areas of Contamination for the Investigation and Remediation of Solid Waste Management Units 39-001(a), 39-001(b), and 39-006(a) at Technical Area 39

Dear Mr. Bearzi:

The purpose of this letter is to request approval for three area of contamination designations for the investigation and remediation of Solid Waste Management Units (SWMUs) 39-001(a), 39-001(b), and 39-006(a). These SWMUs are located in Technical Area 39 (TA-39) but are not contiguous; therefore, an area of contamination designation is being requested for each SWMU. These SWMUs are being investigated and remediated according to the approved revised investigation work plan for the North Ancho Aggregate Area, dated December 2007 (EP2007-0761). Los Alamos National Laboratory (the Laboratory) proposes the boundaries of the area of contamination include the sites shown on the site maps (Attachment 1). The Laboratory is requesting that the area of contamination determinations be effective through the completion of the investigation and remediation activities at the site.

The primary purpose of requesting the area of contamination for each SWMU is to facilitate on-site staging and segregation of approximately 8600 yd^3 of remediation waste and additional layback and overburden spoils without triggering a new point of generation or a new area of placement of waste subject to Resource Conservation and Recovery Act requirements. Designating these areas of contamination will provide the Laboratory with flexibility for compliant on-site management of waste while making final waste determinations and for managing the materials that will be staged until they are returned to their respective excavations.

Excavated overburden and layback environmental media will be sampled and analyzed as needed for volatile organic compounds, semivolatile organic compounds, target analyte list metals, cyanide, nitrates, high explosives (if screening detects their presence), perchlorates, radionuclides, polychlorinated biphenyls, and toxicity characteristic metals. The analytical results will be used to ensure that only environmental media with contaminant concentrations that are less than background or industrial cleanup levels will be returned to the point of origin.

All staging and segregation of waste and environmental media on-site will be conducted in an environmentally protective manner, using a combination of containers and appropriately designed and controlled (e.g., bermed, covered) staging piles. Materials will be containerized and managed in accordance with regulatory requirements upon transfer outside of the area of contamination boundary. All deviations from Appendix B of the approved investigation work plan for the North Ancho Canyon Aggregate Area, and all newly developed waste management strategies for this project will be documented in the investigation report for this aggregate area.

If you have any questions, please contact John McCann at (505) 665-1091 (jmccann@lanl.gov) or Suzy Schulman at (505) 606-1962 (sschulman@doeal.gov).

Sincerely,

Michael J. Graham, Associate Director
Environmental Programs
Los Alamos National Laboratory

Sincerely,

David R. Gregory, Project Director
Environmental Operations
Los Alamos Site Office

James Bearzi 3 *December 12, 2008*
EP2008-0625

MG/DG/DM/JM/AS:sm

Attachment: Site maps designating areas of contamination (LA-UR-08-7860)

Cy: (w/att.)
Laurie King, EPA Region 6, Dallas, TX
Ken Kisiel, Portage, Los Alamos, NM
Steve Yanicak, NMED-OB, White Rock, NM
Katie Roberts, NMED-HWB, Santa Fe, NM
John McCann, EP-CAP, MS M992
Ann Sherrard, ENV-RCRA, MS K490
Suzy Schulman, DOE-LASO, MS A316
Kristine Smeltz, WES-DO, MS M992
EP-CAP File, MS M992
RPF, MS M707

Cy: (w/o att.)
Tom Skibitski, NMED-OB, Santa Fe, NM
Alison Bennett, DOE-LASO (date-stamped letter emailed)
Michael J. Graham, ADEP, MS M991
Alison M. Dorries, EP-WES, MS M992
Dave McInroy, EP-CAP, MS M992
IRM-RMMSO, MS A150

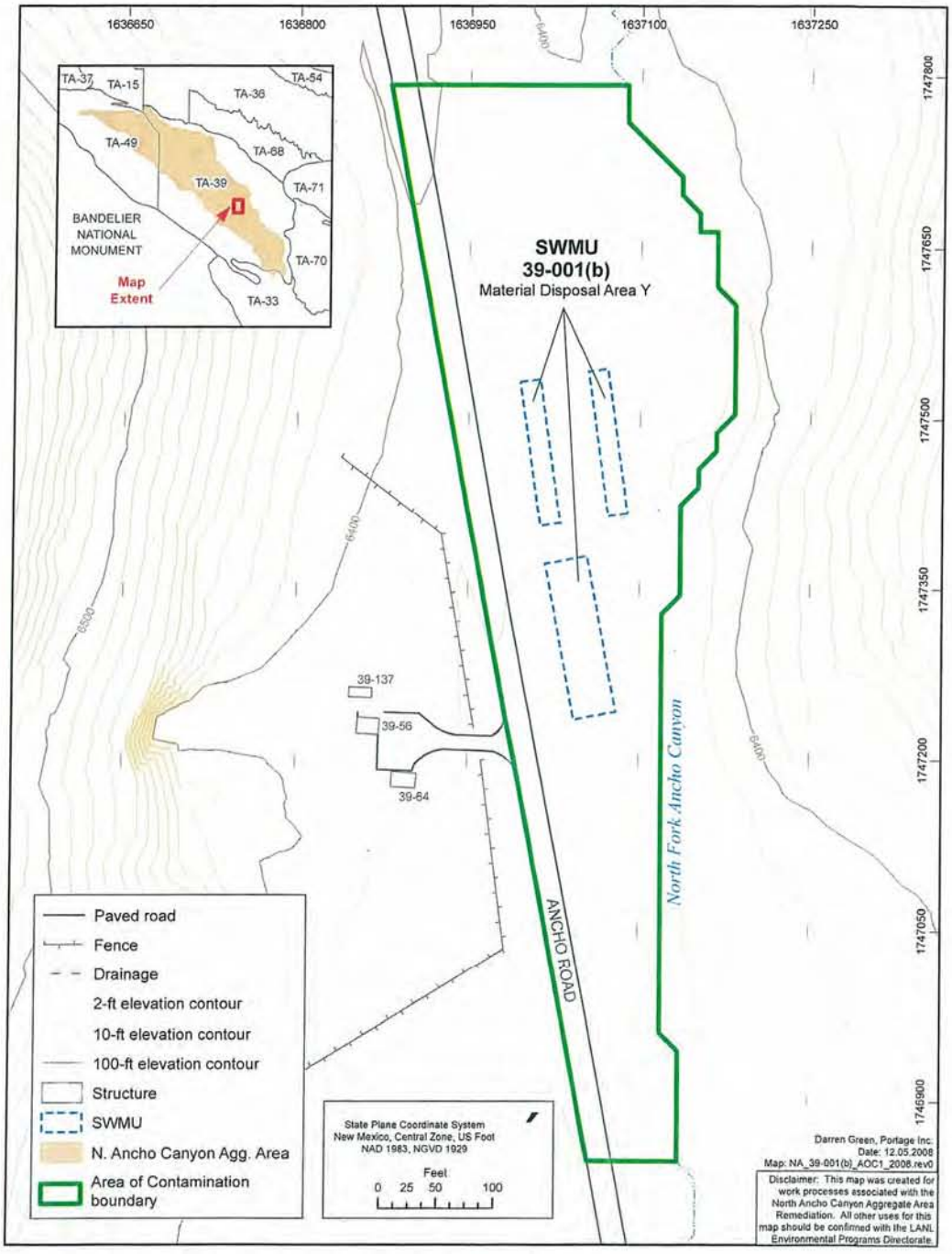

Figure 1. Area of Contamination boundary for SWMU 39-001(b)

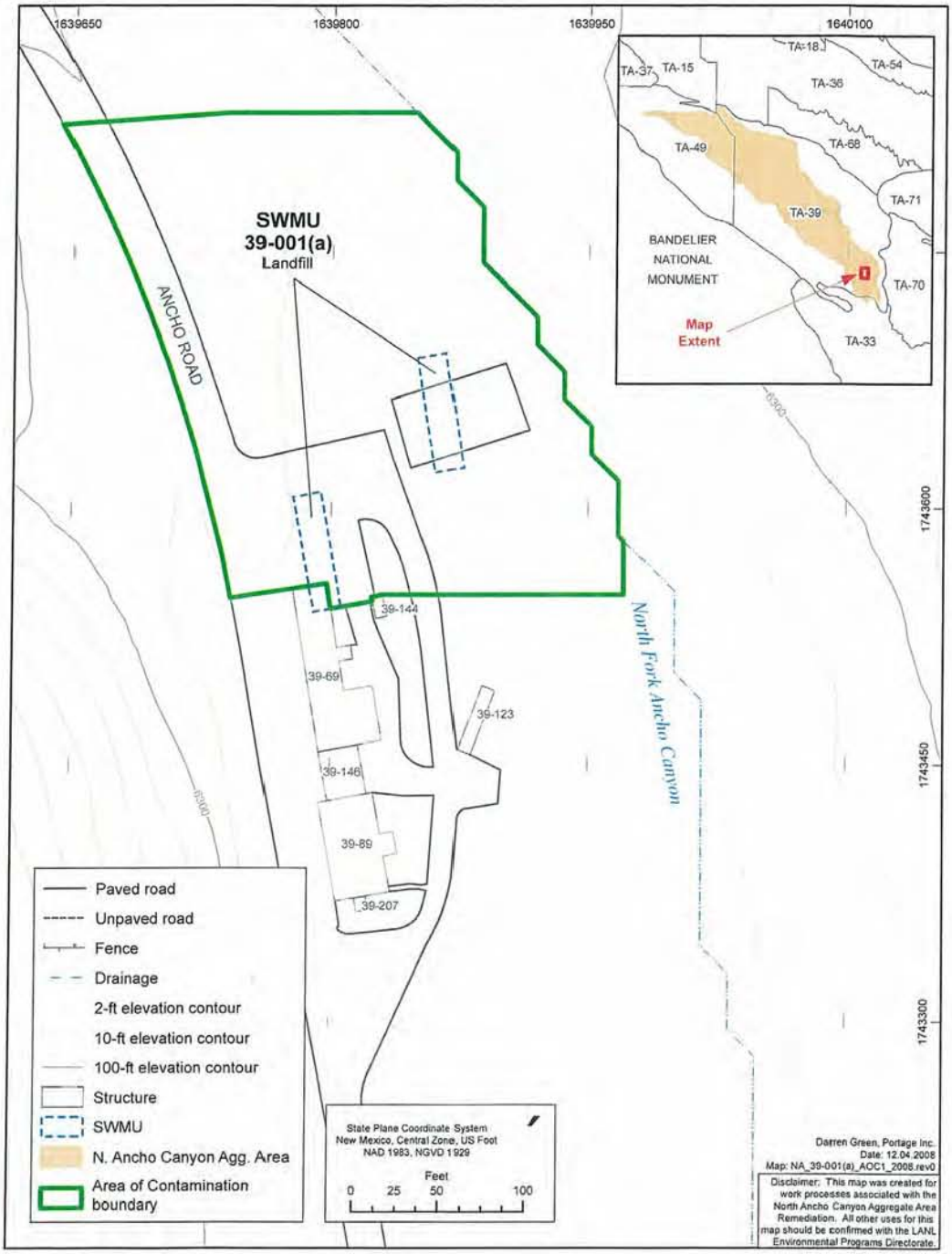

Figure 2. Area of Contamination boundary for SWMU 39-001(a)

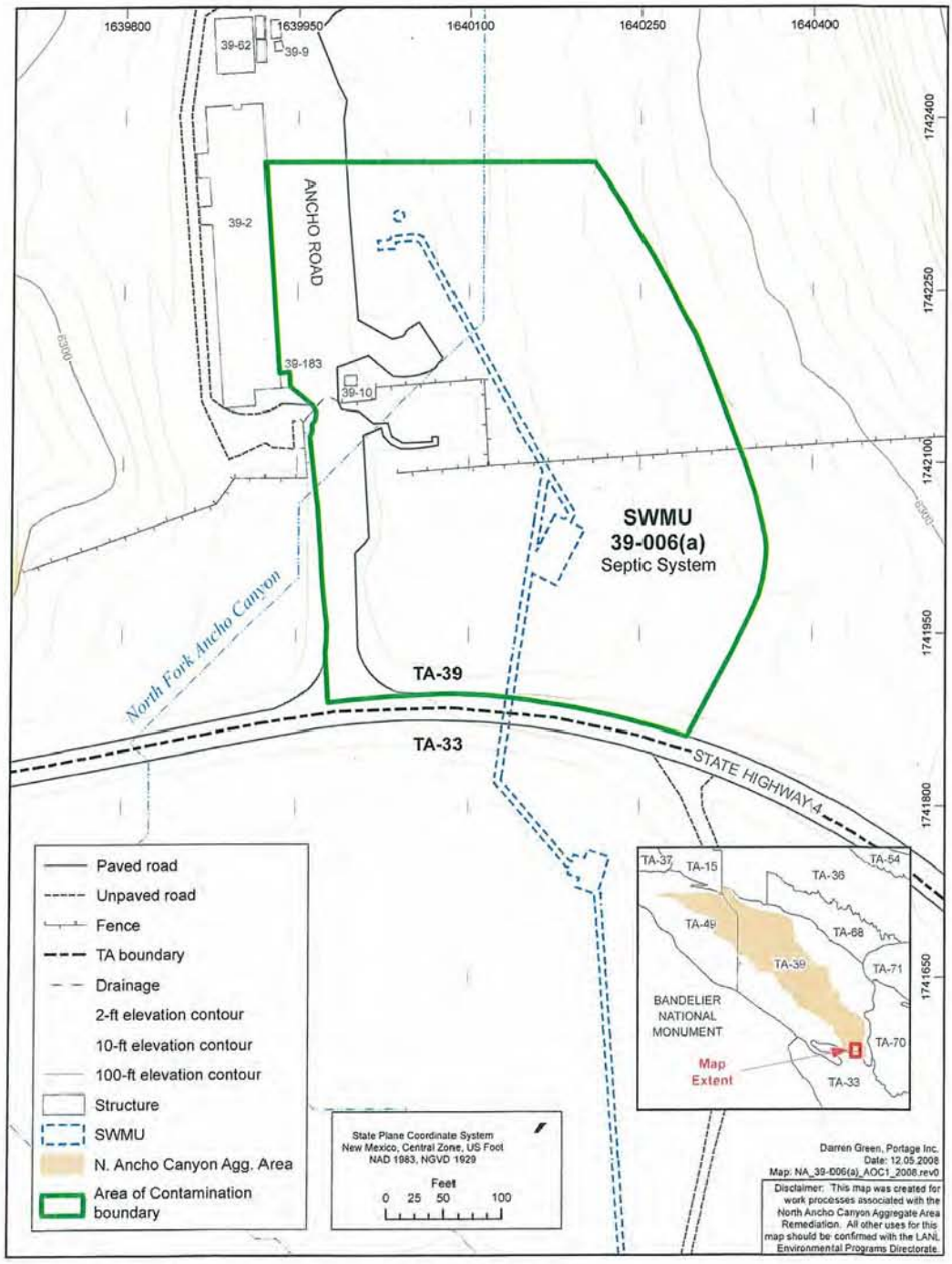

Figure 3. Area of Contamination boundary for SWMU 39-006(a)

NEW MEXICO
ENVIRONMENT DEPARTMENT

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2905 Rodeo Park Drive East, Building 1
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BILL RICHARDSON
Governor

DIANE DENISH
Lieutenant Governor

RON CURRY
Secretary

JON GOLDSTEIN
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

December 30, 2008

David Gregory
Federal Project Director
Los Alamos Site Office
Department of Energy
528 35th Street, Mail Stop A316
Los Alamos, NM 87544

David McInroy
Remediation Services Deputy Project Director
Los Alamos National Laboratory
P.O. Box 1663, MS M992
Los Alamos, NM 87545

08 DEC 31 AM 11:31

RE: APPROVAL OF AN AREA OF CONTAMINATION FOR THE INVESTIGATION AND REMEDIATION OF SOLID WASTE MANAGEMENT UNITS (SWMUS) 39-001(a), 39-001(b), AND 39-006(a), AT TECHNICAL AREA 39 LOS ALAMOS NATIONAL LABORATORY, EPA ID #NM0890010515 HWB-LANL-07-028

Dear Messrs. Gregory and McInroy:

The New Mexico Environment Department (NMED) is in receipt of the Department of Energy and the Los Alamos National Security L.L.C's (collectively the Permittees) *Request for Approval of Areas of Contamination for the Investigation and Remediation of Solid Waste Management Units 39-001(a), 39-001(b), and 39-006(a), at Technical Area 39* dated December 12, 2008 and referenced by EP2008-0625. NMED hereby approves the requested an Area of Contamination (AOC) designation, with the following conditions.

1. The AOC concept is intended to facilitate staging and segregation of remediation wastes without creating a new point of generation subject to the Resource Conservation and Recovery Act (RCRA) and the New Mexico Hazardous Waste Act (HWA). The Permittees shall not return media containing concentrations of contaminants greater than applicable cleanup levels that has been excavated as part of a remedial action, to its point of origin.

2. The Permittees have requested that "environmental media with contaminant concentrations that are less than background or industrial cleanup levels will be returned to the point of origin." NMED will allow the Permittees to return overburden and layback material to the point of origin if contaminant concentrations are less than background or *residential* cleanup levels. The Permittees must sample any layback and overburden material intended for use as backfill for VOCs, SVOCs, TAL metals, cyanide, nitrate, high explosives, perchlorate, radionuclides, and PCBs. At a minimum, the Permittees must collect one profile sample for every 100 cubic yards of stockpiled media.

NMED may require supplemental sampling for staging areas located outside of the original SWMU boundary but within the AOC boundary to ensure no residual contamination remains.

If you have any questions regarding this letter, please contact Kathryn Roberts at (505) 476-6041.

Sincerely,

James P. Bearzi
Chief
Hazardous Waste Bureau

cc: K. Roberts, NMED HWB
D. Cobrain, NMED HWB
S. Yanicak, NMED DOE OB, MS J993
L. King, EPA 6PD-N
M. Graham, ADEP MS J591
G. Rael, DOE LASO, MS A316
file: Reading and LANL '08 (TA-39)

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National Nuclear Security Administration
Los Alamos Site Office, MS A316
Environmental Restoration Program
Los Alamos, New Mexico 87544
(505) 667-4255/FAX (505) 606-2132

Date: April 1, 2009
Refer To: EP2009-0180

James P. Bearzi, Bureau Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

Subject: Request for Approval of Expanded Boundaries for Areas of Contamination for the Investigation and Remediation of Solid Waste Management Units 39-001(a) and 39-001(b) at Technical Area 39

Dear Mr. Bearzi:

The purpose of this letter is to request approval for expanding the boundaries of area of contamination designations for the investigation and remediation of Solid Waste Management Units (SWMUs) 39-001(a) and 39-001(b). These changes were discussed with Dave Cobrain and Kathryn Roberts of your staff on their March 2, 2009, site visit to Los Alamos National Laboratory (the Laboratory). As discussed during their site visit, the size of the disposal pits in SWMU 39-001(a) and the amount of soil mixed with debris in the disposal pits are greater than expected. The Laboratory predicts the same will be true for the disposal pits at SWMU 39-001(b). The primary purpose of requesting the modified area of contamination boundaries is to facilitate staging the excavated debris and soil mixture, segregating debris from the soil, and reusing the soil as backfill in the pits if it meets residential screening levels. The expanded boundaries will provide the space needed to manage the larger-than-expected quantities of waste and soil within the area of contamination boundary associated with each SWMU without triggering a new point of generation or placing waste subject to Resource Conservation and Recovery Act requirements.

The current boundaries of the areas of contamination were approved by the New Mexico Environment Department in a letter dated December 30, 2008. The Laboratory proposes that the boundaries of the area of contaminations be modified to include the areas shown on the site maps in the attached figures. The Laboratory is requesting that the modified area of contamination determinations be effective through the completion of the investigation and remediation activities at the site.

After the debris is segregated from the soil, the debris will be dispositioned as waste. The soil will be sampled and analyzed as needed for volatile organic compounds, semivolatile organic compounds, target analyte list metals, cyanide, nitrates, high explosives (if screening detects their

presence), perchlorates, radionuclides, polychlorinated biphenyls, and toxicity characteristic metals. The analytical results will be used to ensure only environmental media with contaminant concentrations less than background or residential cleanup levels will be returned to the disposal pits. The environmental media returned to the excavation will be placed in the deeper portions of the excavation in the same SWMU from which it was removed.

All staging and segregation of waste and environmental media on-site will be conducted in an environmentally protective manner, using a combination of containers and appropriately designed and controlled (e.g., bermed, covered) staging piles. Materials will be containerized and managed in full accordance with regulatory requirements upon transfer outside of the area of contamination boundary.

If you have any questions, please contact John McCann at (505) 665-1091 (jmccann@lanl.gov) or Suzy Schulman at (505) 606-1962 (sschulman@doeal.gov).

Sincerely,

Michael J. Graham, Associate Director
Environmental Programs
Los Alamos National Laboratory

Sincerely,

David R. Gregory, Project Director
Environmental Operations
Los Alamos Site Office

MG/DG/DM/JM:sm

Attachment: Site Maps Designating Areas of Contamination (LA-UR-09-1994)

Cy: Laurie King, EPA Region 6, Dallas, TX
Steve Yanicak, NMED-OB, White Rock, NM
Tom Skibitski, NMED-OB, Santa Fe, NM
Keyana DeAguero, DOE-LASO (date-stamped letter emailed)
Suzy Schulman, DOE-LASO, MS A316
John McCann, EP-CAP, MS M992
Dave McInroy, EP-CAP, MS M992
Michael J. Graham, ADEP, MS M991
Alison M. Dorries, EP-WES, MS M992
Kristine Smeltz, EP-WES, MS M992
EP-CAP File, MS M992
RPF, MS M707
IRM-RMMSO, MS A150 (date-stamped letter emailed)

James Bearzi 3 April 1, 2009
EP2009-0180

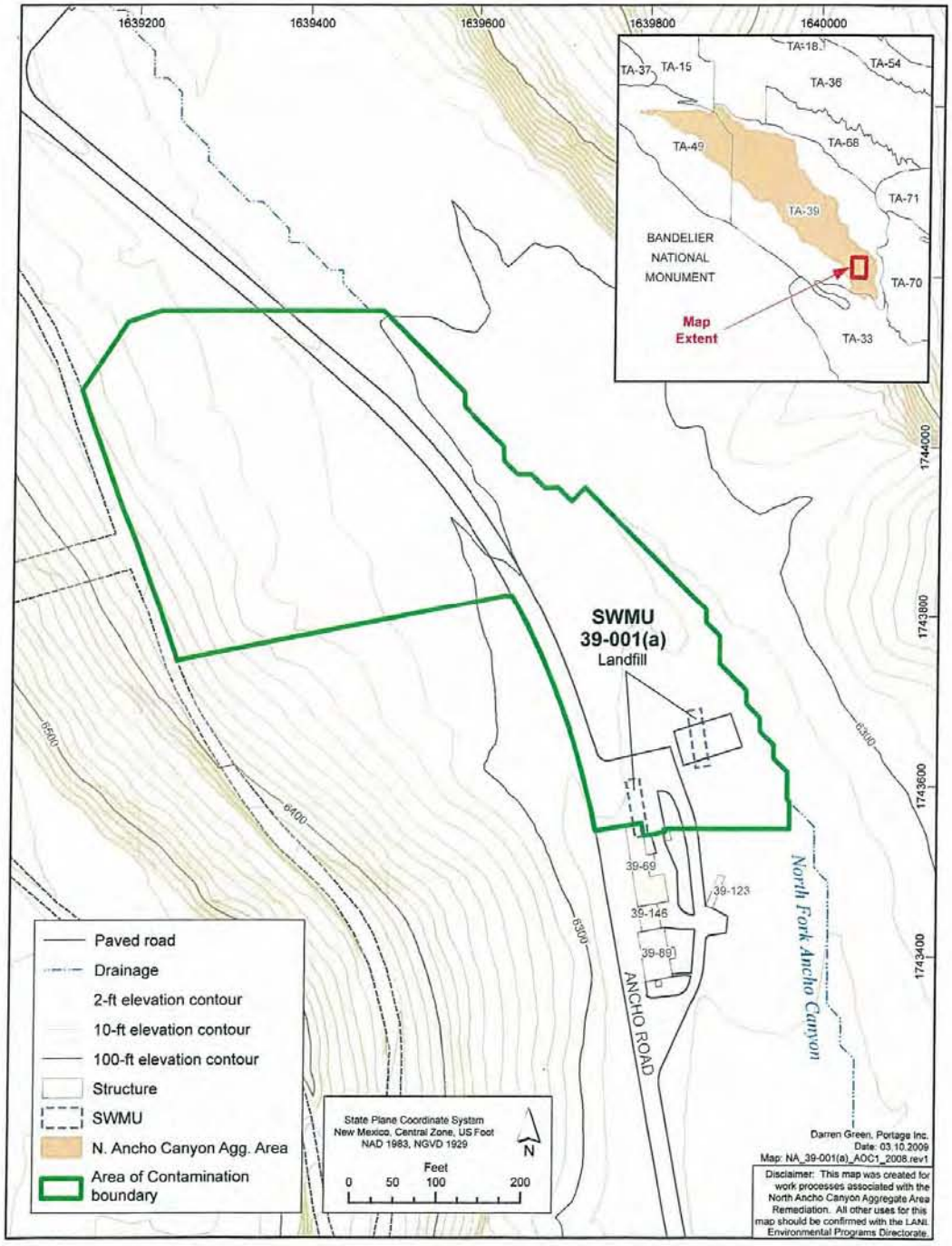

Figure 1 Area of Contamination boundary for SWMU 39-001(a)

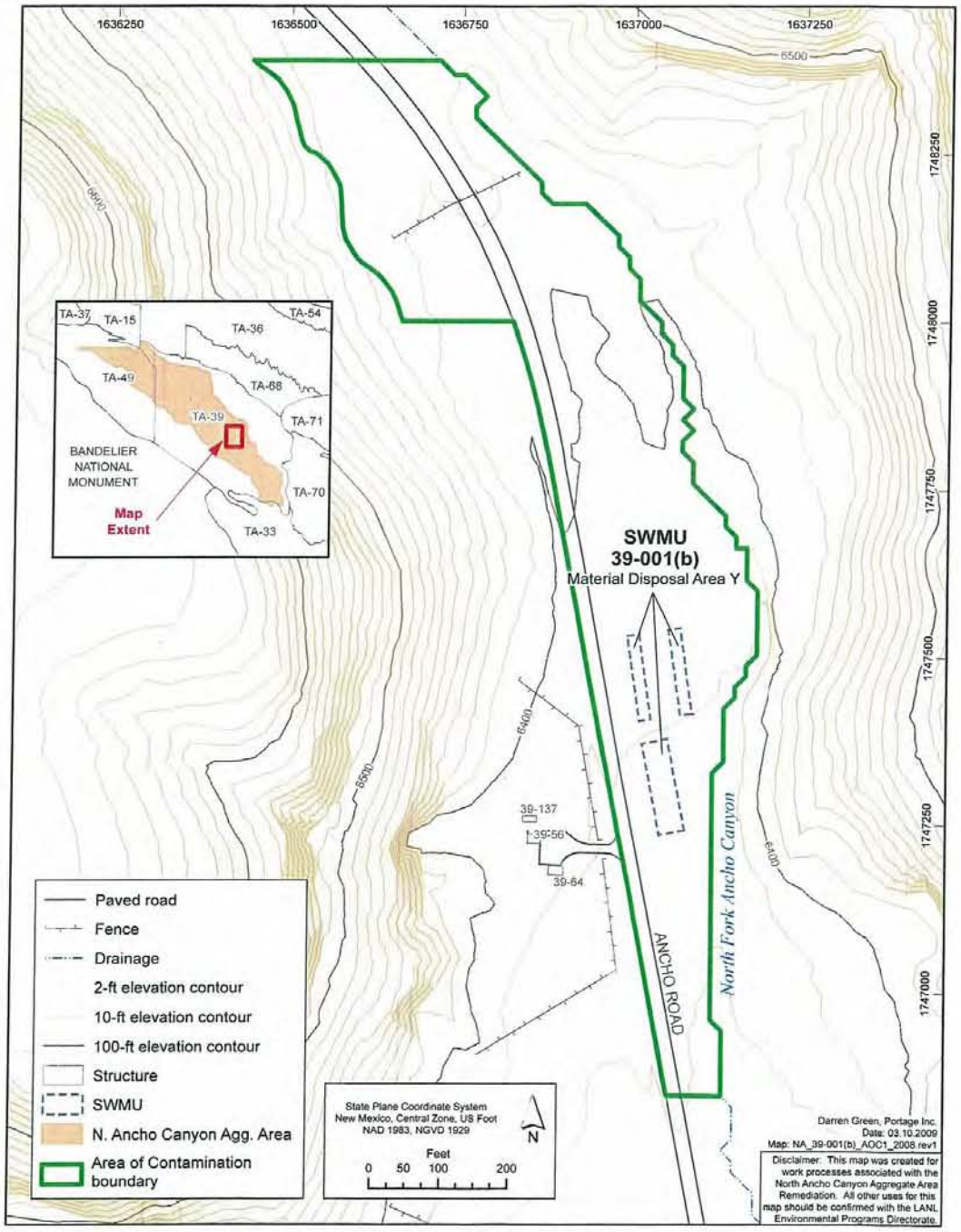

Figure 2 Area of Contamination boundary for SWMU 39-001(b)

NEW MEXICO
ENVIRONMENT DEPARTMENT

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BILL RICHARDSON
Governor

DIANE DENISH
Lieutenant Governor

RON CURRY
Secretary

JON GOLDSTEIN
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

April 6, 2009

David Gregory
Federal Project Director
Los Alamos Site Office
Department of Energy
528 35th Street, Mail Stop A316
Los Alamos, NM 87544

David McInroy
Remediation Services Deputy Project Director
Los Alamos National Laboratory
P.O. Box 1663, MS M992
Los Alamos, NM 87545

RE: APPROVAL OF EXPANDED BOUNDARIES FOR AREAS OF CONTAMINATION FOR THE INVESTIGATION AND REMEDIATION OF SOLID WASTE MANAGEMENT UNITS (SWMUS) 39-001(a) AND 39-001(b), AT TECHNICAL AREA 39 LOS ALAMOS NATIONAL LABORATORY, EPA ID #NM0890010515 HWB-LANL-07-028

Dear Messrs. Gregory and McInroy:

The New Mexico Environment Department (NMED) is in receipt of the Department of Energy and the Los Alamos National Security L.L.C's (collectively the Permittees) *Request for Approval of Expanded Boundaries for Areas of Contamination for the Investigation and Remediation of Solid Waste Management Units 39-001(a) and 39-001(b) , at Technical Area 39* dated April 1, 2009 and referenced by EP2009-0180. NMED hereby approves the request that the Areas of Contamination (AOC) for Solid Waste Management Units (SWMUs) 39-001(a) and 39-001(b) be expanded.

NMED may require supplemental sampling for staging areas located outside of the original SWMU boundary but within the AOC boundary to ensure no residual contamination remains after the staged waste has been removed.

If you have any questions regarding this letter, please contact Kathryn Roberts at (505) 476-6041.

Sincerely,

James P. Bearzi
Chief
Hazardous Waste Bureau

cc: K. Roberts, NMED HWB
D. Cobrain, NMED HWB
S. Yanicak, NMED DOE OB, MS J993
L. King, EPA 6PD-N
M. Graham, ADEP MS J591
G. Rael, DOE LASO, MS A316
file: Reading and LANL '09 (TA-39)

Attachment G-3

LANL Waste Profile System Documentation

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM

WPF #: 41405

17-Aug-2009 02:23 PM (Version: 0) p.1

Generator :	MCCANN, JOHN	MS :	M992	PH :	6651091	Z#:	115625
WMC :	DE SOTEL, RONALD	MS :	J586	PH :	5056655650	Z#:	212070
Contact :							
RCRA Rev :	ELICIO ANDY U	MS :	J496	PH :	5056676956	Z#:	118692
Status :	ACTIVE	Activation Date :	08/17/2009		Expiration Date:		08/17/2010
Group :	ERSS-RS	TA :	39	Bldg :	000000	Room :	00

You are required to keep a copy of the WPF(s) in your files for at least three years. This WPF(s) is valid for one year or as long as the composition of the waste you have characterized remains the same. Should your waste change, please submit a new WPF to Waste Acceptance Group.

Waste Accumn : **PCBs Storage Area Site ID# 5130**
Method of Char : PCB Analysis Number: 09RCRA532/533

Waste Type : **Process Waste/Spent Chemical/Other**
Waste Classes: RCA Waste - **Not RCA Waste**
RAD Waste - **Non-rad**

Waste Category: **Organic**
PCB >= 500 ppm

Waste Sources : **Remediation/Restoration**

Waste Matrix : **Non-aqueous**

Matrix Type : **Heterogeneous**

Process Desc :
DEBRIS EXCAVATED FROM SWMU 39-001(A)

Waste Desc : 2 LARGE CAPACITORS WITH OIL, CONTAINING 100% PCB PACKAGED IN 55 GALLON POLY DRUM WITH ABSORBENT

Ignitability : **Not ignitable**

Corrosivity : **Non-aqueous**

Reactivity : **Non-reactive**

Boiling Point : **Not applicable**

Toxicity Characteristic Metals:

Contaminant	Method	Limit	Min	Max	Unit
ARSENIC	AK	ND			PPM
BARIUM	AK	ND			PPM
CADMIUM	AK	ND			PPM
SILVER	AK	ND			PPM
LEAD	AK	ND			PPM
MERCURY	AK	ND			PPM
SELENIUM	AK	ND			PPM
CHROMIUM	AK	ND			PPM

Toxicity Characteristic Organic Compounds:

Contaminant	Method	Limit	Min	Max	Unit
1,1-DICHLOROETHYLENE	AK	ND			PPM
VINYL CHLORIDE	AK	ND			PPM

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM
WPF #: 41405

17-Aug-2009 02:23 PM (Version: 0) p.2

1,4-DICHLOROBENZENE	AK	ND	PPM
2,4,5-TRICHLOROPHENOL	AK	ND	PPM
2,4,6-TRICHLOROPHENOL	AK	ND	PPM
2,4-DINITROTOLUENE	AK	ND	PPM
BENZENE	AK	ND	PPM
CARBON TETRACHLORIDE	AK	ND	PPM
CHLOROBENZENE	AK	ND	PPM
CHLOROFORM	AK	ND	PPM
CRESOL - MIXED	AK	ND	PPM
HEXACHLOROBENZENE	AK	ND	PPM
HEXACHLOROBUTADIENE	AK	ND	PPM
HEXACHLOROETHANE	AK	ND	PPM
M-CRESOL	AK	ND	PPM
METHYL ETHYL KETONE	AK	ND	PPM
NITROBENZENE	AK	ND	PPM
O-CRESOL	AK	ND	PPM
P-CRESOL	AK	ND	PPM
PENTACHLOROPHENOL	AK	ND	PPM
PYRIDINE	AK	ND	PPM
TETRACHLOROETHYLENE	AK	ND	PPM
TRICHLOROETHYLENE	AK	ND	PPM
1,2-DICHLOROETHANE	AK	ND	PPM

Additional Chemical Constituents and Contaminants:

CAS NO	Constituent	MIN	MAX	UOM
	ABSORBANT	5	10	%
	LARGE PCB CAPACITOR WITH OIL	100	100	%

Additional Information: THIS WASTE WILL BE TSCA REGULATED. WASTE PROMM SWMU 39-001(A) DISPOSAL AREA. WASTE STREAM #3 ON WCSP NORTH ANCHO CANYON AOG ARRA, REVISION 1, EP2009-0054.

WASTE CHARACTERIZATION INFORMATION

Radioactivity Category : **NON-RAD**

RCRA Category : **NON HAZARDOUS**

Secondary Info : N/A

Waste Classification : **PCB WASTE**

Waste Acceptances :

EPA Hazardous Waste Code : N/A

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM

WPF #: 41405

17-Aug-2009 02:23 PM (Version: 0) p.3

GWCP Information

Section 1 - Waste Prevention/Minimization (answer all questions)

Can hazard segregation, elimination, or material substitution be used?	☐ Yes*	☒ No	
Can any of the materials in the waste stream be recycled or reused	☐ Yes*	☒ No	
Has waste minimization been incorporated into procedures or other process controls?	☒ Yes	☐ No	
Can this waste be generated outside a RCA?	☐ Yes*	☐ No	☐ N/A

*Provide Comment

Section 6 - Work Control Documentation (answer all questions)

Do the procedures for this process cover how to manage this waste? ☒ Yes ☐ No (Provide comments)

Do the procedures for this process cover controls to prevent changes to waste constituents and concentrations or addition or removal of waste? ☒ Yes ☐ No (Provide comments)

Section 7 - Package and Storage Control

Describe how the waste will be packaged in according to the applicable WAC:

DSR DOT

Identify the storage management controls that will be used for this waste stream: (check all that apply)

- ☐ Tamper indication devices:
- ☐ Limited use locks with log-in for waste
- ☒ Locked cabinet or building
- ☐ Other (describe)

Section 8 - Waste Certification Statements (check only one)

- ☒ Waste appears to meet WAC chapter for:
  ATTACHMENT 11
- ☐ Waste needs exception/exemption for treatment, storage, or disposal at:
- ☐ Waste does not meet the criteria for any known TSDF, (DOE approval is required. Contact the Waste Management Program Office for assistance.)

Estimated Annual Volume (m3): .075

Appendix H

Risk Assessments

CONTENTS

Figure

Tables

H-1.0 INTRODUCTION

The North Ancho Canyon Aggregate Area lies within Technical Area 39 (TA-39) on Los Alamos National Laboratory (LANL or the Laboratory) property. The North Ancho Canyon Aggregate Area includes both inactive sites undergoing investigation and active firing sites still in use. North Ancho Canyon Aggregate Area consists primarily of firing sites used for testing high explosives, support facilities, and waste disposal areas. Active facilities include firing sites, storage areas, administrative offices, workshops, sewage disposal facilities, and supporting infrastructure. Inactive facilities include firing sites, storage areas, waste disposal areas, and sewage and chemical disposal facilities.

The sites included in this investigation for characterization and remediation are Solid Waste Management Unit (SWMU) 39-002(a) Areas 1 and 3, Area of Concern (AOC) 39-002(c), AOC 39-002(f), SWMU 39-004(c), SWMU 39-004(d), SWMU 39-005, SWMU 39-006(a) active and inactive components, SWMU 39-007(a), AOC 39-007(d), SWMU 39-008, SWMU 39-010, SWMU 39-001(a), and SWMU 39-001(b). Four active sites or areas [SWMUs 39-004(c), 39-004(d), 39-008, and 39-006(a) active components] are included in this investigation report for preliminary characterization, although these sites are impacted by continuing site operations. However, risk-screening assessments were not conducted for these sites because they are currently in use. SWMU 39-002(b) and the surrounding area are covered with concrete and are inaccessible for sampling. Therefore, no human health or ecological risk-screening assessments were conducted for this site. In addition, the results of the investigation of potential contamination of canyon alluvial sediment outside and downgradient of the North Ancho Canyon Aggregate Area within the ephemeral stream channel (the extended drainages) are also included in this investigation report. Investigation activities were conducted between January and July 2009. In addition, historical data from previous investigations completed in 1995 and 1996 are incorporated in this investigation report as appropriate.

H-2.0 BACKGROUND

TA-39 is used primarily as a high-explosives (HE) test-firing site. Experiments conducted at the site center around the behavior of nonnuclear weapons, primarily by photographic techniques. Other activities include the study of various phenomenological aspects of explosives, interactions of explosives, explosions involving other materials, shock-wave physics, equation-of-state measurements, and pulsed-power systems design.

H-2.1 Site Descriptions

H-2.1.1 SWMU 39-002(a) Area 1

SWMU 39-002(a) Storage Area 1 is a former outdoor storage area and satellite accumulation area (SAA) located next to the northwest corner of building 39-02. The site measured approximately 25 × 30 ft and was not paved or protected by any type of roof or walls; the storage area was bounded by various structures on the north, south, and east and an asphalt ramp was located in the east-central portion of the storage area (LANL 2007, 098281). This site was used for storage for approximately 10 yr and was also used for storage before its installation as an SAA. At one time, this site contained a 30-gal. drum, which held small quantities of solvents and adhesives, along with rags and paper wipes contaminated with solvents or adhesives. The area was also used to store lead-containing materials and damaged capacitors and transformers that may have contained polychlorinated biphenyls (PCBs). The area has not been used since 1993 (LANL 2007, 098281).

H-2.1.2 SWMU 39-002(a) Area 3

SWMU 39-002(a) Area 3 is a former outdoor SAA and holding/receiving area located on the asphalt driveway at the north end of the loading dock on the southeast side of building 39-02. This area is no longer used for storage (LANL 2007, 098281). Whether Area 3 was used for storage before its installation as a SAA is not known. Area 3 was not sampled previously because the area was being used for product storage.

H-2.1.3 AOC 39-002(c)

This area is an outside storage area on asphalt next to the gas-gun support structure (structure 39-56) associated with SWMU 39-008. This SAA stored waste paper, solvent-contaminated rags, and vacuum grease. It is unknown if this area was used for storage before its installation as an SAA (LANL 1993, 015316).

H-2.1.4 AOC 39-002(f)

AOC 39-002(f) is a former SAA located on the asphalt driveway outside the northeast corner of a support structure (structure 39-88) for an active firing site [SWMU 39-004(e)]. Before this area became an SAA, it was used to store small quantities of waste solvents, copper sulfate, transformer oil, vacuum grease, and photographic wastes (LANL 1993, 015316, p. 5-18).

H-2.1.5 SWMU 39-004(c)

SWMU 39-004(c) is an active firing site and active operating Resource Conservation and Recovery Act (RCRA) open detonation site (structure 39-06) subject to RCRA closure requirements. This site is located in the southern-most western tributary of Ancho Canyon in the canyon bottom between an ephemeral stream, a steep hill slope to the north, and a steep hill slope to the south. A release assessment showed that low levels of organic and inorganic chemicals and radionuclides have been dispersed around the site and decrease in concentration as distance increases from the firing site (LANL 2007, 098281).

H-2.1.6 SWMU 39-004(d)

SWMU 39-004(d) (structure 39-57) is an active firing site and an active RCRA operating unit subject to RCRA closure requirements. The firing pad is located in the canyon bottom between a diverted ephemeral stream and the canyon wall. SWMU 39-004(d) is located approximately 75 ft southeast from SWMU 39-004(a), also a firing site (LANL 2007, 098280).

H-2.1.7 SWMU 39-005

SWMU 39-005 is the site of a former seepage pit used to dispose of HE-contaminated decant from operations at an explosives operations building (building 39-04). The seepage pit measured approximately 5 × 5 × 7 ft and was not lined or otherwise contained. The gravel and HE-contaminated soil that comprised the pit were removed in 1986 (LANL 1993, 015316, p. 5-42).

H-2.1.8 SWMU 39-006(a) Septic System Active Components

The active components of SWMU 39-006(a) consist of an active septic system (structure 39-104), an active sand filter that replaced the inactive septic system, and an active outfall.

In 1985, a new 2500-gal. precast concrete septic tank (structure 39-104) and drainline were installed after use of the original septic tank (structure 39-12) was discontinued. At the same time, the sand filter south of NM 4 was redesigned and replaced. New piping was added (the 4-in. line under NM 4 was retained to avoid tearing up the road, and the new pipe was tied into the existing line). In approximately 1989, the outfall from the new sand filter was plugged, eliminating the discharge into the canyon (LANL 1995, 046190, pp. 4-41 to 4-45).

H-2.1.9 SWMU 39-007(a) Storage Area

SWMU 39-007(a) is a former storage area located on a concrete pad under a covered porch outside the northeast corner of an equipment shelter (structure 39-63) at TA-39. The dates of operation of the storage area are unknown. Used oil containing lead and solvents was stored at this SWMU. The area around the concrete pad is relatively flat but slopes eastward to a local drainage near the adjacent road.

H-2.1.10 AOC 39-007(d)

AOC 39-007(d) is a storage area (structure 39-142) consisting of a bermed asphalt pad covered with a metal roof located at the south end of Subaggregate Area 2. A valved drainpipe discharges stormwater from the bermed area across the access road toward the Ancho Road drainage (LANL 1993, 015316, p. 5-20). The storage area was initially used for storage of metal and an occasional drum of silicon transformer oil. Later, it became an SAA where chemicals were stored at the site, including dielectric fluid, ethylene glycol, solvents, and kerosene. The SAA was removed in the 1990s, but the storage area continues to be used for storing nonhazardous materials like cable and wire.

H-2.1.11 SWMU 39-008

SWMU 39-008 is an area of potential soil contamination from a gas-gun firing site near a Morgan shed (building 39-137), which houses a single-stage gas-gun with a 6-in.-diameter barrel. The gas-gun is used for outdoor experiments; gas is used as a propellant to fire depleted-uranium projectiles at targets on the cliff face (LANL 1993, 015316, p. 5-26). Testing at this site was conducted from 1960 to 1975, suspended for 13 yr, and then resumed in 1988 (LANL 1993, 015316, p. 5-26). Most the debris from the gas-gun firings is scattered over the area just west of the building, but occasionally projectiles and target fragments hit the cliff face, which is situated approximately 200 ft west of another building associated with this experimental gun (building 39-56). Photographic evidence shows the area between the buildings and the cliff has been leveled, and the removed surface materials were pushed into a mound on the south side of the test area. The gas gun is currently used for experimental purposes and housed in building 39-137.

H-2.1.12 SWMU 39-010

SWMU 39-010 is an area used for staging soil excavated during the 1978 construction of a firing site [SWMU 39-004(e)], located at the south end of Subaggregate Area 1. During construction of SWMU 39-004(e), large quantities of soil were removed and deposited in the canyon east of the firing site, forming SWMU 39-010 (LANL 1993, 015316). This soil dump covers approximately 76,200 ft^2 and is currently covered with vegetation, including shrubs and small trees.

H-2.1.13 Extended Drainages

The extended drainages consist of the drainage channels adjacent to the sites under investigation as well as the main ephemeral stream channel running through North Ancho Canyon. The extended drainages are not a SWMU or AOC, but are included in this investigation to assess the potential for off-site migration of contamination from the SWMUs/AOCs under investigation

H-2.1.14 SWMU 39-001(a)

SWMU 39-001(a) consists of two inactive disposal pits located east and north of the light gas-gun facility (building 39-69). The exact boundaries of the pits are unknown, but each pit likely measures approximately 80 × 20 ft, and are 10 ft deep. Interviews of site workers indicate the pits were used for disposal from 1953 to 1979 (LANL 1993, 015316, p. 5-2). Portions of the pits may be covered by building 39-69 and a concrete pad east of the building. Materials disposed of in the pits include firing-site debris, empty chemical containers, and office waste.

H-2.1.15 SWMU 39-001(b)

SWMU 39-001(b) consists of three trenches used to dispose of debris from SWMU 39-008, empty chemical containers, and office waste (LANL 1993, 015316). Pit 1 was originally known as Material Disposal Area Y and was constructed in the late 1960s. Pit 2 was originally constructed parallel and next to Pit 1 and was used from 1976 to 1981. Pit 3 was constructed directly south of the other two pits and was used from 1981 to 1989. All three pits were closed and covered by May 1989.

H-2.1.16 SWMU 39-006(a) Septic System Inactive Components

SWMU 39-006(a) inactive components consists of an inactive 1800-gal septic tank reinforced with concrete (structure 39-12), associated drainlines, and an inactive chemical seepage pit. The tank was connected to the now inactive sand filter by approximately 260 ft of vitrified clay pipe, which discharged to an outfall in Ancho Canyon. The inactive septic system was constructed in 1952 to dispose of photographic processing chemicals and was only connected to building 39-02 (LANL 1993, 015316, p. 5-40). In 1985, use of septic tank 39-12 was discontinued, the waste removed from the tank, and the tank filled with sand. In about 1989, the outfall from the new sand filter was plugged, eliminating discharge into the canyon (LANL 1995, 046190, p. 4-41 to 4-45).

H-2.2 Sampling Results

The final data set used to identify chemicals of potential concern (COPCs) and evaluate potential risks to human health and the environment for the North Ancho Canyon Aggregate Area consists of all validated data compiled from both historical sampling activities and the 2009 investigation. Only those data determined to be decision-level following the data-quality assessment (Appendix E) are included in the final data set evaluated in Appendix B and in this appendix.

Decision-level data used to determine COPCs for the North Ancho Canyon Aggregate Area include results obtained from samples collected during the following investigations/activities:

- 1994 RCRA facility investigation (RFI) sampling and the 1997 excavation and sampling of test pits at SWMU 39-001(a) (LANL 1997, 055633)
- 1995 RFI sampling and 1997 voluntary corrective action sampling at SWMU 39-002(a) Area 1 (LANL 1995, 046190; LANL 1997, 056758)

- 1995 Phase I RFI sampling at SWMUs 39-004(c) and 39-004(d) (ICF Kaiser Engineers 1997, 097812; LANL 1997, 055633)
- 1993 RFI and 1996 sampling at SWMU 39-006(a) (ICF Kaiser Engineers 1995, 062968; LANL 1995, 046190)
- 1995 VCA and 2001 sampling for PCBs at SWMU 39-007(a) (LANL 1996, 053786; LANL 2001, 071215)
- 1993 Phase I RFI at SWMU 39-008 (ICF Kaiser Engineers 1997, 097812).

H-2.3 Determination of COPCs

Appendix B summarizes the COPC selection process and provides a data summary. Only COPCs identified in Appendix B were retained. The industrial and recreational scenarios utilize data for samples collected from 0–1 ft below ground surface (bgs). The ecological risk screening utilizes data for samples collected from 0–5 ft bgs. The residential scenario utilizes data for samples collected from 0–10 ft bgs. In addition, no confirmatory samples were collected in the surface (0–1 ft bgs) interval at the three sites that underwent excavation [SWMUs 39-001(a), 39-001(b), and 39-006(a) inactive components] because all the material in this depth range was removed during the excavation. Tables H-2.3-1 to H-2.3-23 summarize the COPCs evaluated for risk for each of the sites within the North Ancho Canyon Aggregate Area included in this investigation. Some of the COPCs identified in Appendix B may not be evaluated for potential risk under one or more scenarios because they were only identified as COPCs below the depth interval associated with a given scenario.

H-3.0 CONCEPTUAL SITE MODEL

The sites within the North Ancho Canyon Aggregate Area consist of four types. The first type includes the majority of sites no longer used for the operations under which they became designated as SWMUs or AOCs. This group includes SWMU 39-002(a), AOC 39-002(b), AOC 39-002(c), AOC 39-002(f), SWMU 39-005, SWMU 39-007(a), AOC 39-007(d), and SWMU 39-010. These sites were used primarily to store materials; however, SWMU 39-010 was used for staging soil excavated during the 1978 construction of a firing site. These sites could have COPCs in surface soil from spills and previous operations. Some of the COPCs may have migrated to the subsurface soil as well.

The second type of sites had COPCs associated with subsurface structures or buried waste. The sites in this group are SWMUs 39-001(a), 39-001(b), and 39-006(a) inactive components. These sites may have COPCs associated with buried waste, with the subsurface structures, or from migration of COPCs into the surrounding soil laterally and vertically from the subsurface sources.

The third type of sites includes only the extended drainages. This area of ephemeral channel bottom is not a SWMU or AOC but was investigated as a potential pathway for lateral migration of contaminants from the individual SWMUs and AOCs in the aggregate area.

The fourth type of sites includes the active sites. These sites are included in this investigation report for preliminary characterization, although these sites are impacted by continuing site operations. These sites were given a preliminary evaluation in Appendix B for nature and extent, but no risk assessments were conducted because they are subject to continuing releases that would render any risk assessments inaccurate because of changing concentrations of COPCs over time. This group includes the active firing sites [SWMUs 39-004(c), 39-004(d), and 39-008] for which only limited sampling was done. The active components of the SWMU 39-006(a) septic system are also subject to continuing releases. However, the

work plan included SWMU 39-006(a) inactive components as one of the sites for characterization (LANL 2007, 098280, p. v), so a risk-screening assessment is also provided for SWMU 39-006(a) active components.

H-3.1 Receptors and Exposure Pathways

The current and reasonably foreseeable future land use for the SWMUs and AOCs in the North Ancho Canyon Aggregate Area is industrial; therefore, the receptor reasonably expected to be present is a Laboratory worker. The extended drainages lie within the ephemeral stream channel, which is subject to intermittent flooding; therefore, the recreational scenario was evaluated as the current and reasonably foreseeable future use for the extended drainages. Evaluation of the residential scenario is included for all sites as well per the Compliance Order on Consent (the Consent Order). The primary exposure pathway for human receptors is surface soil as well as subsurface soil/tuff, which 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 (approximately 550 ft bgs) and dry conditions at the site. Human receptors 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. The exposure pathways are the same as those for surface soil. Sources, exposure pathways, and receptors are shown in the conceptual site model (CSM) (Figure H-3.1-1).

The sites of the North Ancho Canyon Aggregate Area all lie in the bottom of the canyon. The sites provide potential habitat for ecological receptors, except where sites are covered with asphalt or structures. For unpaved sites or areas of sites, exposure pathways to ecological receptors are complete. Exposure is assessed at each 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 dust, dermal contact, incidental ingestion of soil, external irradiation, and food web transport. Pathways from subsurface releases may be complete for plants. Surface water was not evaluated because of the lack of surface water features. Sources, exposure pathways, and ecological receptors are presented in the CSM (Figure H-3.1-1).

H-3.2 Environmental Fate and Transport

The evaluation of environmental fate addresses the chemical processes affecting the persistence of a chemical in the environment; the evaluation of transport addresses the physical processes affecting mobility of a contaminant along a migration pathway. Migration 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 also limited by a lack of hydrostatic pressure as well as the lack of a source for the continued release of contamination. Without sufficient moisture and a source, little or no potential migration of materials through the vadose zone to groundwater occurs.

Contamination at depth is addressed in the discussion of extent (Appendix B). 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 to the absence of the key factors that facilitate migration, as discussed above. Given how long the contamination has been present in the subsurface, physical and chemicals properties of the COPCs, and the lack of saturated conditions, the potential for contaminant migration to groundwater is very low.

The New Mexico Environment Department (NMED) guidance (NMED 2009, 106420) 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 the North Ancho 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. Except at the active firing sites, most releases at the North Ancho Canyon Aggregate Area are historical (i.e., they occurred decades ago). The regional aquifer beneath the aggregate area is approximately 550 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 occurred already. Sampling has shown that this migration has not occurred, indicating a very low potential for future contaminant migration to groundwater.

Stormwater or snowmelt infrequently flows down the main channel (extended drainages) in North Ancho Canyon following from the northwest end of the canyon towards NM 4. The best indication of the potential for surface water transport of contaminants carried by stormwater is the current distribution of contaminants within the extended drainages. Section B-2.15-5 in Appendix B describes the pattern of distribution of inorganic and organic chemicals and radionuclides within the extended drainages. Concentrations of inorganic COPCs are generally highest near the active firing sites but decrease to background farther down the canyon. Concentrations of organic COPCs are generally limited to locations near the sites along the drainages and are not further detected downgradient of the sites. Elevated concentrations of radionuclides are more widespread through the channel but still decrease from north to south. The distribution of all COPCs indicated that contamination is migrating into the extended drainages in the proximity of the aggregate area sites but are not migrating further down the main channel or off site; this pattern indicates a low potential for the lateral migration of contaminants through surface water transport.

The relevant release and transport processes of the COPCs are a function of chemical-specific properties, which include the relationship between the physical form of the COPC and the nature of the 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 chemical and physical properties of the North Ancho Canyon Aggregate Area COPCs are presented in Tables H-3.2-1, H-3.2-2, and H-3.2-3.

The primary release and transport mechanisms that may lead to the potential exposure of receptors in the North Ancho 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 from operational activities and historical remediation efforts, elevated levels of COPCs tend to remain concentrated in the vicinity of the original release points.

H-3.2.1 Inorganic Chemicals

In general, and particularly in a semiarid climate such as that found at the sites within the North Ancho 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) 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 H-3.2-1 presents the K_d values for the inorganic COPCs identified at the North Ancho Canyon Aggregate Area sites. Based on this criterion, aluminum, antimony, barium, beryllium, cadmium, chromium, cobalt, lead, manganese, mercury, nickel, thallium, vanadium, and zinc have a 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 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.

- 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 (average pH = 6.9) present in the North Ancho 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. The average soil pH is 6.9 in the North Ancho Canyon Aggregate Area, so leaching of copper is unlikely.

- Cyanide tends to adsorb onto various natural media, including clay and sediment; however, sorption is insignificant relative to the potential for cyanide to volatilize and/or biodegrade. At soil surfaces, volatilization of hydrogen cyanide is a significant mechanism for cyanide loss. Cyanide occurring at low concentrations in subsurface soil is likely to biodegrade under both aerobic and anaerobic conditions. The extent of cyanide is defined.
- Iron is naturally occurring in soil and tuff and may be relatively mobile under reducing conditions. Iron is sensitive to soil pH conditions and occurs in two oxidation states: iron (III), the insoluble oxidized form, and iron (II), the reduced soluble form. Most iron in well drained neutral to alkaline soil is present as precipitates of iron (III) hydroxides and oxides. With time, these precipitates are mineralized and form various iron-bearing minerals, such as lepidcrocite, hematite, and goethite. Iron is not expected to be mobile in the neutral soil (average pH = 6.9) in the North Ancho Canyon Aggregate Area. The extent of iron is defined.
- Nitrate (and to a lesser degree perchlorate) is highly soluble in water and may migrate with water molecules in saturated soil. Nitrate is also naturally occurring and the concentrations detected reflect this. As noted above, the subsurface material beneath the North Ancho Canyon Aggregate Area sites has low moisture content, which inhibits the mobility of nitrate and 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 soil pH at the sites within the North Ancho Canyon Aggregate Area is 6.9, which indicates that selenium is not likely to migrate in this soil.
- Silver sorbs onto soil and sediment and tends to form complexes with inorganic chemicals and humic substances in soil. Organic matter complexes with silver and reduces its mobility. Silver compounds do not leach under dry conditions as found in North Ancho canyon and therefore does not migrate into the subsurface. The extent of silver is defined at depth.

H-3.2.2 Organic Chemicals

Table H-3.2-2 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 for the North Ancho Canyon Aggregate Area. Physical and chemical properties of organic chemicals are important when evaluating their fate and transport. The following physiochemical property information illustrates some aspects of the fate and transport tendencies of the North Ancho 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; amino-4,6-dinitrotoluene[2-]; amino-2,6,dinitrotoluene[4-]; benzoic

acid; chloromethane; dinitroaniline[3,5-]; hexanone[2-]; octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX); iodomethane; methylene chloride; trichloroethene; and trichlorofluoromethane 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-1242; Aroclor-1248; Aroclor-1254; Aroclor-1260; benzene; 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; dichlorophenyltrichloroethylene[4,4'-] (DDE); dichlorodiphenyltrichloroethane[4,4'-] (DDT); dieldrin; di-octylphthalate; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; phenanthrene; pyrene, and tetrachlorodibenzodioxin[2,3,7,8-] (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; bromobenzene; chloromethane; dichlorobenzene[1,2-]; dichlorobenzene[1,4-]; diphenylamine; ethylbenzene; hexanone[2-]; iodomethane; isopropylbenzene; isopropyltoluene[4-]; methylene chloride; methylnaphthalene[2-]; naphthalene; nitrotoluene[4-]; styrene; toluene; trichloroethene; trichlorofluoromethane; trimethylbenzene[1,2,4-]; trimethylbenzene[1,3,5-]; xylene[1,2-]; xylene[1,3-]; and xylene[1,3-+xylene[1,4-] 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; chrysene; dibenz(a,h)anthracene; DDT[4,4'-]; di-n-octylphthalate; HMX; indeno(1,2,3-cd)pyrene; pentaerythritol tetranitrate (PETN); hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX); TCDD[2,3,7,8-]; and tetryl 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; acenapthylene; anthracene; Aroclor-1242; Aroclor-1248; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k)fluoranthene; bis(2 ethylhexyl)phthalate; bromomethane; butylbenzylphthalate; chrysene; dibenz(a,h)anthracene; dibenzofuran; dichlorobenzene[1,2-]; 1,4-dichlorobenzene; DDE[4,4'-]; DDT[4,4'-]; dieldrin; di-n-butylphthalate; di-n-octylphthalate; diphenylamine; ethylbenzene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; isopropylbenzene; isopropyltoluene[4-]; methylnaphthalene[2-]; naphthalene; phenanthrene; pyrene; TCDD[2,3,7,8-]; trimethylbenzene[1,2,4-]; trimethylbenzene[1,3,5-]; xylene[1,2-]; xylene[1,3-]; and xylene[1,3-+xylene[1,4-]. 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; amino-4,6-dinitrotoluene[2-]; amino-2,6,dinitrotoluene[4-]; benzene; benzoic acid; bromobenzene; chloromethane; dinitroaniline[3,5-]; dinitrotoluene[2,4-]; hexanone[2-]; HMX; iodomethane; methylene chloride; nitrotoluene[4-]; PETN; RDX; styrene; tetryl; trichloroethene; trichlorofluoromethane; trinitrobenzene[1,3,5-]; and trinitrotoluene[2,4,6-] 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 (NMED 2006, 092513). Acenaphthene; acenapthylene; anthracene; Aroclor-1242; 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; chrysene; dibenz(a,h)anthracene; dibenzofuran; DDE[4,4'-]; DDT[4,4'-]; dieldrin; di-n-butylphthalate; dinitroaniline[3,5-]; di-n-octylphthalate; diphenylamine; ethylbenzene; fluoranthene; fluorene; HMX; indeno(1,2,3-cd)pyrene; isopropylbenzene; methylnaphthalene[2-]; naphthalene; PETN; phenanthrene; pyrene; styrene; TCDD[2,3,7,8-]; tetryl; 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; amino-4,6-dinitrotoluene[2-]; amino-2,6,dinitrotoluene[4-]; benzene; benzoic acid; bromobenzene; dichlorobenzene[1,2-]; dichlorobenzene[1,4-]; dinitrotoluen[2,4-]; hexanone[2-]; iodomethane; methylene chloride; nitrotoluene[4-]; RDX; toluene; trichloroethene; trichlorofluoromethane; xylene[1,2-]; xylene[1,3-]; and xylene[1,3-+xylene[1,4-].

Anthracene; Aroclor-1242; Aroclor-1248; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; chrysene; dibenz(a,h)anthrachene; DDE[4,4'-]; DDT[4,4'-]; 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; benzene; benzoic acid; bromobenzene; chloromethane; dichlorobenzene[1,2-]; dichlorobenzene[1,4-]; diphenylamine; ethylbenzene; hexanone[2-]; iodomethane; methylene chloride; toluene; trichloroethene; trichlorofluoromethane; xylene[1,2-]; xylene[1,3-]; and xylene[1,3-+xylene[1,4-] 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 and the extent is defined, they are not likely to migrate to groundwater.

H-3.2.3 Radionuclides

Radionuclides are generally not highly soluble or mobile in the environment, particularly in the semiarid climate of LANL. 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 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 H-3.2-3 gives physical and chemical properties of the radionuclide COPCs identified at the North Ancho Canyon Aggregate Area sites. Based on K_d values, americium-241, cesium-137, plutonium-238, and plutonium-239 have a very low potential to migrate towards groundwater at the sites within the North Ancho Canyon Aggregate Area. The K_d values for isotopic uranium and tritium are less than 40 and indicate a potential to migrate towards groundwater.

- One or more uranium isotopes were retained as COPCs at most of the North Ancho Canyon Aggregate Area sites. In general, the actinide nuclides form comparatively insoluble compounds in the environment and are therefore not considered biologically mobile. The actinides are transported in ecosystems mainly by physical and sometimes chemical processes. They tend to attach, sometimes strongly, to surfaces, and they tend to accumulate in soil and sediment. Subsequent movement is largely associated with geological process such as erosion and sometimes leaching. The extent is defined at shallow depths (3 ft bgs or less) and the depth to groundwater is approximately 550 ft.

- Tritium's initial behavior in the environment is determined by the source. If it is released as a gas or vapor to the atmosphere, substantial dispersion can be expected, and the rapidity of deposition is dependent on climatic factors. If tritium is released in liquid form, it is diluted in surface water and is subject to physical dispersion, percolation, and evaporation (Whicker and Schultz 1982, 058209, p. 147). Tritium concentrations in the subsurface at the area of elevated radioactivity are low (<1 pCi/g), indicating that the area of elevated radioactivity is not a significant source of tritium, although this radionuclide is relatively mobile. Because tritium migrates in association with moisture, the low moisture content of the subsurface limits the potential for tritium to migrate to groundwater.

H-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 limit (UCL) of the arithmetic mean was calculated when possible 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 (in a few cases a maximum detection limit was used because the COPC was not detected). The EPC for dioxin and furan congeners is the sum of the detected congeners weighted by the World Health Organization (WHO) 1995 Toxic Equivalent Factors (TEFs); the sum is expressed as the TCDD[2,3,7,8-] equivalent. The TEFs used (http://www.epa.gov/ncea/pdfs/dioxin/part2/drich9.pdf) are presented in Table H-3.3-1, and the TEF calculations are provided as Attachment H-1 (on CD). Most sites had a single sample analyzed for dioxins and furans; if a site had dioxin/furan results for multiple samples, a UCL was calculated using the TCDD[2,3,7,8-] equivalent concentrations for each sample. The summary statistics, including the EPC for each COPC for the human health and the ecological risk-screening assessments and the distribution used for the calculation, are presented in Tables H-2.3-1 to H-2.3-23.

Calculation of UCLs of the mean concentrations was done using the U.S. Environmental Protection Agency (EPA) ProUCL 4.00.04 software (EPA 2007, 106124), 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). Key aspects of ProUCL are that it tests data against an expanded range of distribution types, contains a larger suite of statistical tests, and can perform analyses on datasets with nondetected values nondetected values. The ProUCL documentation strongly recommends against using the maximum detected concentration for the EPC. However, it also cautions against using statistical values calculated on less than four to six detected results in a large data set. Therefore, the maximum detected concentration was used to represent the EPC for COPCs with less than five detected values, because the resultant statistical estimate may not be reliable. In these cases, if the observations are highly skewed and result in significant risk due to use of the maximum detected concentration the COPC is further assessed in the uncertainty section of this document. Input and output data files for ProUCL calculations are provided on CD as Attachment H-2.

H-4.0 HUMAN HEALTH RISK SCREENING

The human health risk-screening assessments were conducted for each site within the North Ancho Canyon Aggregate Area. All sites were screened for the residential scenario using data from 0 to 10 ft

bgs. Individual SWMUs and AOCs were also screened for the industrial scenario because these sites lie within the current operational area of TA-39. Three of the sites [SWMUs 39-004(c), 39-004(d), and 39-008] within the operational area are active firing sites undergoing preliminary characterization, and did not undergo a risk-screening assessment. The area included in the extended drainages lies within and along the ephemeral stream channel; this area was screened using the recreational scenario instead of the industrial scenario. The human health risk-screening assessments compared either the EPC of each COPC with SSLs for chemicals and screening action levels (SALs) for radionuclides. Both the industrial and recreational risk-screening assessments used data from 0–1 ft bgs, while the residential assessment used data from 0 to 10 ft bgs.

H-4.1 Soil Screening Levels

Human health risk-screening assessments for nonradiological COPCs were conducted using SSLs for the industrial and residential scenarios obtained from NMED guidance (NMED 2009, 106420). The NMED SSLs are based on a target hazard quotient (HQ) of 1.0 and a target cancer risk of 1×10^{-5} (NMED 2009, 106420). If SSLs were not available from NMED guidance, the EPA regional screening tables (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm) were used. The EPA regional screening levels for carcinogens were multiplied by 10 to adjust from a 10^{-6} cancer risk level to the NMED target cancer risk level of 10^{-5}. Recreational SSLs were obtained from Laboratory guidance (LANL 2007, 094496) based on the same target risk levels as the NMED SSLs. Surrogate chemicals were also used for some COPCs without a SSL based on structural similarity or because the COPC is a breakdown product (NMED 2003, 081172). Exposure parameters used to calculate the industrial, recreational, and residential SSLs are presented in Table H-4.1-1.

Radionuclide SALs for the industrial, recreational, and residential scenarios are used for comparison with radionuclide EPCs and were derived using the residual radioactive model, Version 6.21 (LANL 2005, 088493). The SALs are based on a 15-mrem/yr dose per U.S. Department of Energy (DOE) guidance (DOE 2000, 067489). Exposure parameters used to calculate the industrial, recreational, and residential SALs are presented in Tables H-4.1-2 through H-4.1-4.

Carcinogenic risk was determined by dividing the EPC by the NMED, adjusted EPA, or Laboratory SSL, multiplying the ratio by 1×10^{-5} to obtain the risk for the individual COPC, and summing the individual COPC risks to obtain a total excess cancer risk for the site. The HQ was obtained by dividing the EPC by the NMED, EPA, or Laboratory SSL and summing the HQs to obtain the hazard index (HI) for the site. The dose is determined by dividing the EPC by the SAL, multiplying the ratio by 15 mrem/yr, and summing the individual doses to obtain the total dose for the site.

H-4.2 Screening Evaluation

H-4.2.1 SWMU 39-002(a) Area 1

SWMU 39-002(a) Area 1 is a former outdoor storage area and SAA between two buildings currently in use with a concrete sidewalk spanning the central area of the site. Therefore, it was screened using industrial and residential SSLs and SALs.

The total excess cancer risk for the industrial scenario is 2×10^{-5} (Table H-4.2-1), which is slightly above the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The elevated cancer risk is primarily from benzo(a)pyrene, which exceeded its industrial SSL. The HI for the industrial scenario is 0.1 (Table H-4.2-2), which is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose based

on an industrial exposure is 0.1 mrem/yr (Table H-4.2-3), which is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The total excess cancer risk for the residential scenario is 6×10^{-5} (Table H-4.2-4), which is above the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The elevated cancer risk is primarily from benzo(a)pyrene and dibenz(a,h)anthracene, which exceeded their residential SSLs. The HI for the residential scenario is 0.8 (Table H-4.2-5), which is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose based on a residential exposure is 0.6 mrem/yr (Table H-4.2-6), which is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

Total petroleum hydrocarbon (TPH) diesel range organics (DRO) was also detected in several 2009 samples at a maximum concentration of 170 mg/kg (range was 9.8 mg/kg to 170 mg/kg). The maximum TPH-DRO concentration was compared to the NMED TPH screening guidelines for unknown oil (200 mg/kg for industrial and residential direct exposure) and for diesel #2/crankcase oil (520 mg/kg and 1120 mg/kg for industrial and residential direct exposure, respectively) (NMED 2006, 094614). The 170 mg/kg is below all screening guidelines.

H-4.2.2 SWMU 39-002(a) Area 3

SWMU 39-002(a) Area 3 is a former SAA located on an asphalt driveway outside a building currently in use. Therefore, it was screened using industrial and residential SSLs. There are no radionuclide COPCs identified for this site.

The total excess cancer risk for the industrial scenario is 8×10^{-7} (Table H-4.2-7), which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI for the industrial scenario is 0.0009 (Table H-4.2-8), which is below the NMED target HI of 1.0 (NMED 2009, 106420).

The total excess cancer risk for the residential scenario is 4×10^{-6} (Table H-4.2-9), which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI for residential scenario is 0.05 (Table H-4.2-10), which is below the NMED target HI of 1.0 (NMED 2009, 106420).

H-4.2.3 SWMU 39-002(c)

SWMU 39-002(c) is a former SAA located on a concrete pad at an active firing site. Therefore, it was screened using industrial and residential SSLs. There are no radionuclide COPCs identified for this site.

The total excess cancer risk for the industrial scenario is 6×10^{-8} (Table H-4.2-11), which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI for the industrial scenario is 0.005 (Table H-4.2-12), which is below the NMED target HI of 1.0 (NMED 2009, 106420).

The total excess cancer risk for the residential scenario is 3×10^{-7} (Table H-4.2-13), which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI for residential scenario is 0.07 (Table H-4.2-14), which is below the NMED target HI of 1.0 (NMED 2009, 106420).

H-4.2.4 SWMU 39-002(f)

SWMU 39-002(f) is a former SAA located on an asphalt driveway next to the support structure at an active firing site. All samples were collected under the asphalt. This site was screened using the industrial and residential SSLs. There are no radionuclide COPCs identified for this site.

The total excess cancer risk for the industrial scenario is 1×10^{-9} (Table H-4.2-15), which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI for the industrial scenario is 0.003 (Table H-4.2-16), which is below the NMED target HI of 1.0 (NMED 2009, 106420).

The total excess cancer risk for the residential scenario is 7×10^{-7} (Table H-4.2-17), which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI for residential scenario is 0.04 (Table H-4.2-18), which is below the NMED target HI of 1.0 (NMED 2009, 106420).

H-4.2.5 SWMU 39-004(c)

This is an active firing site not currently being considered for cleanup or removal from the permit. Based on the approved work plan (LANL 2007, 098280, p. vi), an interim sampling strategy was proposed to identify the COPCs, to determine if contaminants are migrating, and to confirm that active firing activities are dispersing the same contaminants as those dispersed by historical firing activities. That information is presented in Appendix B. No risk screening for human health was conducted for the active sites.

H-4.2.6 SWMU 39-004(d)

This is an active firing site not currently being considered for cleanup or removal from the permit. Based on the approved work plan (LANL 2007, 098280, p. vi), an interim sampling strategy was proposed to identify the COPCs, to determine if contaminants are migrating, and to confirm that active firing activities are dispersing the same contaminants as those dispersed by historical firing activities. That information is presented in Appendix B. No risk screening for human health was conducted for the active sites.

H-4.2.7 SWMU 39-005

SWMU 39-005 is a former seepage pit for disposal of HE-contaminated liquids. This site was screened using the industrial and residential SSLs and SALs.

The total excess cancer risk for the industrial scenario is 5×10^{-6} (Table H-4.2-19), which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI for the industrial scenario is 0.003 (Table H-4.2-20), which is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose for an industrial exposure is 0.14 mrem/yr (Table H-4.2-21), which is below DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The total excess cancer risk for the residential scenario is 1×10^{-5} (Table H-4.2-22), which is equivalent to the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI for residential scenario is 0.4 (Table H-4.2-23), which is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose for a residential exposure is 0.86 mrem/yr (Table H-4.2-24), which is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

H-4.2.8 SWMU 39-006(a) Active Components

The active components of SWMU 39-006(a) comprise the current active septic system for the surrounding buildings. Only the area at the outfall was sampled to provide initial characterization. This outfall area was screened using the industrial and residential SSLs. There are no radionuclide COPCs identified for this site.

The total excess cancer risk for the industrial scenario is 7×10^{-9} (Table H-4.2-25), which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI for the industrial scenario is 0.002 (Table H-4.2-26), which is below the NMED target HI of 1.0 (NMED 2009, 106420).

The total excess cancer risk for the residential scenario is 3×10^{-8} (Table H-4.2-27), which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI for residential scenario is 0.03 (Table H-4.2-28), which is below the NMED target HI of 1.0 (NMED 2009, 106420).

H-4.2.9 SWMU 39-007(a)

SWMU 39-007(a) is a former storage area located on a concrete pad under the covered porch of an equipment storage area. This site was screened using the industrial and residential SSLs. There are no radionuclide COPCs identified for this site.

The total excess cancer risk for the industrial scenario is 4×10^{-5} (Table H-4.2-29), which is above the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The elevated cancer risk is primarily from Aroclor-1254, which exceeded the industrial SSL, and Aroclor-1260. The HI for the industrial scenario is 0.002 (Table H-4.2-30), which is below the NMED target HI of 1.0 (NMED 2009, 106420).

The total excess cancer risk for the residential scenario is 3×10^{-5} (Table H-4.2-31), which is slightly above the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The elevated cancer risk is primarily from Aroclor-1254 and Aroclor-1260, which exceeded their residential SSLs. The HI for residential scenario is 2.3 (Table H-4.2-32), which is above the NMED target HI of 1.0 (NMED 2009, 106420). The elevated HI is from Aroclor-1254, which exceeded its residential SSL.

H-4.2.10 SWMU 39-007(d)

SWMU 39-007(d) is a former SAA currently used for storage of equipment. This site was screened using the industrial and residential SSLs and SALs.

The total excess cancer risk for the industrial scenario is 1×10^{-6} (Table H-4.2-33), which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI for the industrial scenario is 0.007 (Table H-4.2-34), which is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose for an industrial exposure is 0.01 mrem/yr (Table H-4.2-35), which is below DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The total excess cancer risk for the residential scenario is 6×10^{-6} (Table H-4.2-36), which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI for residential scenario is 0.4 (Table H-4.2-37), which is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose for a residential exposure is 0.08 mrem/yr (Table H-4.2-38), which is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

H-4.2.11 SWMU 39-008

SWMU 39-008 is an active firing site not currently being considered for cleanup or removal from the permit. Based on the approved work plan (LANL 2007, 098280, p. vi), an interim sampling strategy was proposed to identify the COPCs, to determine if contaminants are migrating, and to confirm that active firing activities are dispersing the same contaminants as those dispersed by historical firing activities. That information is presented in Appendix B. No risk screening for human health was conducted for the active sites.

H-4.2.12 SWMU 39-010

SWMU 39-010 is an area that was used for staging soil during construction at nearby firing sites. This area was screened using the industrial and residential SSLs and SALs.

The total excess cancer risk for the industrial scenario is 7×10^{-7} (Table H-4.2-39), which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI for the industrial scenario is 0.06 (Table H-4.2-40), which is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose for an industrial exposure is 1.3 mrem/yr (Table H-4.2-41), which is below DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The total excess cancer risk for the residential scenario is 1×10^{-5} (Table H-4.2-42), which is equivalent to the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI for residential scenario is 0.4 (Table H-4.2-43), which is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose for a residential exposure is 6.1 mrem/yr (Table H-4.2-44), which is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

Magnesium was identified as a COPC but does not have a published toxicity value. It is among those elements identified in section 5.9.4 of EPA's Risk Assessment Guidance for Superfund [RAGS] (EPA 1989, 008021) as an essential macronutrient. As an essential nutrient, magnesium may be compared to the recommended daily allowance (RDA) for adults and children. The RDA is 420 mg/d of magnesium for an adult male, 320 mg/d for an adult female, and 240 mg/d for a child (National Research Council 1989, 064000). If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected at SWMU 39-010 of 967 mg/kg, at the EPA default adult soil ingestion rate of 100 mg/d of soil, an adult would ingest approximately 0.14 mg/d of magnesium. At the intake level of 0.14 mg/d of magnesium, the adult's ingestion of magnesium is far less than the RDA for magnesium of 320 to 420 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected at SWMU 39-010 of 967 mg/kg, at the EPA default child soil ingestion rate of 200 mg/d of soil, a child would ingest approximately 0.32 mg/d of magnesium. At the intake level of 0.32 mg/d of magnesium, the child's ingestion of magnesium is far less than the RDA for magnesium of 240 mg/d. Therefore, no adverse health effects are expected from magnesium at 967 mg/kg, and magnesium is eliminated as a COPC.

H-4.2.13 Extended Drainages

The extended drainages are not a SWMU or an AOC but are being investigated for the potential for contaminants to migrate into and through the drainage. This site was screened using the recreational and residential SSLs and SALs.

The total excess cancer risk for the recreational scenario is 1×10^{-6} (Table H-4.2-45), which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI for recreational scenario is 0.07 (Table H-4.2-46), which is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose for a recreational exposure is 0.11 mrem/yr (Table H-4.2-47), which is below DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

The total excess cancer risk for the residential scenario is 9×10^{-6} (Table H-4.2-48), which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI for residential scenario is 0.4 (Table H-4.2-49), which is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose for a residential exposure is 2.3 mrem/yr (Table H-4.2-50), which is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

H-4.2.14 SWMU 39-001(a)

This SWMU has undergone remediation, and confirmatory sampling has indicated that additional soil removal is necessary because PCB levels exceed the industrial cleanup levels. As a result, the risk-screening assessments for SWMU 39-001(a) have not been conducted. Once the SWMU has been remediated to industrial cleanup levels, the risk-screening assessments will be provided.

H-4.2.15 SWMU 39-001(b)

SWMU 39-001(b) contained buried waste, which has been excavated as part of the North Ancho Canyon Aggregate Area investigation. Residual concentrations of COPCs were screened using the residential SSLs and SALs. The industrial scenario was not evaluated for this site because no confirmatory samples were taken in the 0- to 1-ft bgs depth. All environmental media from a minimum of 0 to 5 ft were removed as part of the remediation and replaced with clean fill or stockpiled dirt analyzed to ensure it was below residential SSLs.

The total excess cancer risk for the residential scenario is 2×10^{-6} (Table H-4.2-51), which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI for residential scenario is 0.2 (Table H-4.2-52), which is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose for a residential exposure is 0.04 mrem/yr (Table H-4.2-53), which is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

H-4.2.16 SWMU 39-006(a) Inactive Components

The inactive components of SWMU 39-006(a) include components of the former septic system for the surrounding buildings. The components include the inactive septic tank, the inactive sand filter, and the former chemical seepage pit (the inactive line could not be sampled as it was tied to the active line). The industrial scenario was not evaluated for this site because no confirmatory samples were taken in the 0- to 1-ft bgs depth. The site was screened using the residential SSLs and SALs.

The total excess cancer risk for the residential scenario is 2×10^{-7} (Table H-4.2-54), which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI for residential scenario is 0.3 (Table H-4.2-55), which is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose for a residential scenario is 0.87 mrem/yr (Table H-4.2-56), which is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489).

H-4.3 Uncertainty Analysis

H-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 that are detected or that have detection limits above background are retained for further analysis. However, established BVs may not accurately represent certain subunits of the Bandelier Tuff (e.g., fractured, clay-rich material) encountered during sampling because such data are not included in the background data set. 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 may include errors in sampling, laboratory analysis, and data analysis. However, because concentrations used in the risk-screening evaluations include those detected less than estimated quantitation limits and nondetects above BVs, data evaluation uncertainties are expected to have little effect on the risk-screening results.

H-4.3.2 Exposure Assessment

The following exposure assessment uncertainties were identified for the risk assessment: (1) the applicability of the scenarios, (2) the assumptions underlying the exposure pathways, and (3) the depth over which SSLs were applied for a scenario and the derivation of the 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 2009, 106420). For the sites evaluated, workers are not on-site for that frequency and duration. As a result, the industrial scenario evaluated at these sites overestimates the exposure and risk/dose. The residential scenario is based on exposure of 24 h/d, 350 d/yr, and 30 yr (NMED 2009, 106420) and also overestimates the potential exposure and risk/dose. This is particularly true at TA-39 because none of the sites have residences. The recreational scenario assumes 1 hr/event, 200 events per year, for 30 yr and overestimates the exposure for a hiker. In addition, the child extended backyard exposure assumed for this scenario is not possible because the current and reasonably foreseeable future land use and the access restrictions in place at TA-39.

A number of assumptions are made relative to exposure pathways, including input parameters, the completeness of a given pathway, the contaminated media to which an individual may be exposed, and the intake rates for different routes of exposure. In the absence of site-specific data, the exposure assumptions used were consistent with default values (NMED 2009, 106420). When several upper-bound values (as are found in NMED 2009, 106420) are combined to estimate exposure for any one pathway, the resulting risk can exceed the 99^{th} 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 result in exposure in the same manner as if they were in soil overestimates the potential exposure and risk to receptors.

Uncertainty is introduced in the concentration aggregation of data for estimating the EPCs at a site. 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 the average exposure across the site. Potential risk and exposure from a single location or area with relatively high COPC concentrations may be underestimated if a representative, sitewide value is used. The use of the maximum detected concentration for the EPC overestimates the exposure to contamination because receptors are not consistently exposed to the maximum detected concentration across the site. Maximum detected concentrations were used as the EPCs for the industrial scenario for most COPCs at many of the sites. In addition, many of the organic COPCs were detected only once and use of the maximum detected concentration as the EPC substantially overestimates the exposure at the site.

Some volatile organic compounds (VOCs) were detected in soil and tuff at a few sites. The primary sources of VOCs were the surface storage areas, which stored small quantities of waste solvents or solvent contaminated materials, located on asphalt, and the asphalt itself. NMED SSLs do not include an evaluation of VOCs migration into indoor air. However, EPA Region 6 had screening levels for an indoor worker that included a pathway for inhalation of VOCs volatilized from soil (EPA 2007, 099314). The maximum VOC concentrations detected in soil/tuff across the aggregate area were compared to the EPA Region 6 indoor worker screening values and shows that VOC concentrations are substantially less than

the screening values (2 to 8 orders of magnitude difference) (Table H-4.3-1). Iodomethane does not have a screening value but was detected infrequently (five samples) and at very low levels (maximum concentration is 0.0009 mg/kg). Based on this evaluation, the vapor intrusion into buildings at TA-39 is an unlikely pathway for exposure. In addition, the EPA's draft guidance (EPA 2002, 094114, p. 2) for evaluating subsurface vapor intrusion specifically states that the approaches are primarily designed to ensure protection in residential settings. The possible adjustment for other land uses, in this case industrial, is discussed in EPA's draft guidance (EPA 2002, 094114, p. 3). The draft guidance indicates on that the Occupational Safety and Health Administration generally takes the lead in addressing occupational exposures (EPA 2002, 094114, p. 3). The document further states that workers generally understand the workplace regulations (and monitoring, as needed) that already apply and are provided for their protection. In general, therefore, EPA does not expect this guidance to be used for settings that are primarily occupational.

H-4.3.3 Toxicity Assessment

The primary uncertainty associated with the screening values is related to the derivation of toxicity values used in their calculation. Toxicity values (slope factors [SFs] and reference doses [RfDs]) were used to derive the risk-based screening values used in the screening evaluation (NMED 2009, 106420). Uncertainties were identified in five areas with respect to the toxicity values: (1) extrapolation from other animals to humans, (2) interindividual variability in the human population, (3) the derivation of RfDs and SFs, (4) the chemical form of the COPC, and (5) the use of surrogate chemicals.

H-4.3.3.1 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 between animals and humans in chemical absorption, metabolism, excretion, and toxic responses. 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.

H-4.3.3.2 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 no-observed-adverse-effect level (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.

H-4.3.3.3 Derivation of RfDs and SFs

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 between other animals and humans in chemical absorption, metabolism, excretion, and toxic response. 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 into each of these steps, resulting in the overestimation of potential risk.

H-4.3.3.4 Chemical Form of the COPC

COPCs may be bound to the environmental matrix and not available for absorption into the human body. However, the exposure scenarios default to the assumption that the COPCs are bioavailable. This assumption can lead to an overestimation of the total risk.

H-4.3.3.5 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 acenaphthylene, benzo(g,h,i)perylene, and isopropyltoluene[4-] based on structural similarity. The overall impact of surrogates on the risk assessment is minimal because these COPCs were generally detected at low concentrations (less than 1 mg/kg).

COPCs without Toxicity Values

No toxicity values were available from the EPA Integrated Risk Information System or Health Effects Assessment Summary Tables for iodomethane, triaminotrinitrobenzene (TATB), and PETN detected at sites in the North Ancho Canyon Aggregate Area. Iodomethane was detected once at each of four SWMUs and in the extended drainages. Iodomethane was not detected at a concentration greater than 0.0009 mg/kg. PETN was detected in one sample at 0.02 mg/kg at SWMU 39-002(a) Area 3 and at 0.36 mg/kg in one sample in the extended drainages. TATB was detected in three samples in the extended drainages at 11.6 mg/kg, 1 mg/kg, and 0.597 mg/kg. Therefore, these COPCs are unlikely to have significant effects on the risks for these sites.

H-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.

H-4.3.5 Lead Toxicity

The lead SSLs are based on a blood level of 10 µg/dL using EPA's Integrated Exposure Uptake Biokinetic model. For the sites in the North Ancho Canyon Aggregate Area lead was a COPC for five sites. The ratios of the lead EPCs to the SSLs were 0.1 or less and the HIs were all less than 1.0 for these sites. Therefore, lead is not driving a hazard and the concentrations are not exceeding a blood lead level of 10 µg/dL for any of the receptors. Therefore, an independent assessment of lead is not warranted.

H-4.4 Interpretation of Results

The total excess cancer risks were less than or equivalent to the NMED target level of 1×10^{-5} and the HI was below the NMED target of 1.0 for the industrial and residential scenarios at SWMU 39-002(a) Area 3, AOC 39-002(c), AOC 39-002(f), SWMU 39-005, SWMU 39-006(a) active components, SWMU 39-007(d), and SWMU 39-010. The total excess cancer risks were less than the NMED target level of 1×10^{-5} and the HI was below the NMED target of 1.0 for the residential scenario, which was the only scenario

evaluated, for SWMU 39-001(b) and SWMU 39-006(a) inactive components. The extended drainages had a total excess cancer risk and HI below the NMED target levels for the recreational and residential scenarios. Total doses for the industrial, recreational (extended drainages only), and residential scenarios at all sites were below the DOE target of 15 mrem/yr. The NMED target levels for cancer risk and the HI were exceeded for the industrial and residential scenarios at SWMU 39-007(a) due to Aroclor-1254 and Aroclor-1260. The industrial and residential scenarios also has total excess cancer risks above the target level at SWMU 39-002(a) Area 1 primarily from benzo(a)pyrene (dibenz[a,h]anthracene also for residential).

H-4.4.1 SWMU 39-002(a) Area 1

The industrial cancer risk of 2×10^{-5} exceeds the NMED target level of 1×10^{-5} (NMED 2009, 106420). The industrial HI of 0.1 is below the NMED target HI of 1.0 (NMED 2009, 106420). The industrial dose of 0.1 mrem/yr is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The residential cancer risk of 6×10^{-5} exceeds the NMED target of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.8 is below the NMED target HI of 1.0 (NMED 2009, 106420). The residential dose of 0.6 mrem/yr is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). In addition, the TPH-DRO concentrations were below NMED screening guidelines.

The total dose for the industrial scenario is equivalent to a total risk of 3×10^{-8}, based on a comparison with EPA's outdoor worker preliminary remediation goals (PRGs) for radionuclides (available 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 7×10^{-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).

Based on the results of the screening assessments, there is potential unacceptable risk from benzo(a)pyrene under the industrial scenario and from benzo(a)pyrene and dibenz(a,h)anthracene under the residential scenarios. There are no unacceptable hazards or doses from COPCs for the industrial and residential scenarios.

H-4.4.2 SWMU 39-002(a) Area 3

The industrial cancer risk of 8×10^{-7} is below the NMED target level of 1×10^{-5} (NMED 2009, 106420). The industrial HI of 0.0009 is below the NMED target HI of 1.0 (NMED 2009, 106420). The residential cancer risk of 4×10^{-6} is below NMED target level of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.05 is below the NMED target HI of 1.0 (NMED 2009, 106420). No radionuclide COPCs were identified at this site.

Based on the results of the risk-screening assessments, there are no potential unacceptable risks from COPCs for the industrial and residential scenarios.

H-4.4.3 AOC 39-002(c)

The industrial cancer risk of 6×10^{-8} is below the NMED target for risk of 1×10^{-5} (NMED 2009, 106420). The industrial HI of 0.005 is below the NMED target HI of 1.0 (NMED 2009, 106420). The residential cancer risk of 3×10^{-7} is below the NMED target level of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.07 is below the NMED target HI of 1.0 (NMED 2009, 106420). No radionuclide COPCs were identified for this site.

Based on the results of the risk-screening assessments, there are no potential unacceptable risks from COPCs for the industrial and residential scenarios.

H-4.4.4 AOC 39-002(f)

The industrial cancer risk of 1×10^{-9} is below the NMED target level of 1×10^{-5} (NMED 2009, 106420).The industrial HI of 0.003 is below the NMED target HI of 1.0 (NMED 2009, 106420). The residential cancer risk of 7×10^{-7} is below NMED target level of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.04 is below the NMED target HI of 1.0 (NMED 2009, 106420). No radionuclide COPCs were identified at this site.

Based on the results of the screening assessments, there are no potential unacceptable risks from COPCs for the industrial or residential scenarios.

H-4.4.5 SWMU 39-005

The industrial risk of 5×10^{-6} is below the NMED target for risk of 1×10^{-5} (NMED 2009, 106420). The industrial HI of 0.003 is below the NMED target for hazard of 1.0 (NMED 2009, 106420). The industrial dose rate of 0.14 mrem/yr is below DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The residential risk of 1×10^{-5} is equivalent to the NMED target for risk of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.4 is below the NMED target for hazard of 1.0 (NMED 2009, 106420). The residential dose rate of 0.86 mrem/yr is below 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 1×10^{-7}, based on a comparison with EPA's outdoor worker PRGs for radionuclides (available 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^{-8}, 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).

Based on the results of the risk-screening assessments, there are no potential unacceptable risks and doses from COPCs for the industrial and residential scenarios.

H-4.4.6 SWMU 39-006(a) Active Components

The industrial cancer risk of 7×10^{-9} is below the NMED target level of 1×10^{-5} (NMED 2009, 106420). The industrial HI of 0.002 is below the NMED target HI of 1.0 (NMED 2009, 106420). The residential cancer risk of 3×10^{-8} is below the NMED target level of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.03 is below the NMED target HI of 1.0 (NMED 2009, 106420). No radionuclide COPCs were identified at this site.

Based on the results of the risk-screening assessments, there are no potential unacceptable risks from COPCs for the industrial and residential scenarios.

H-4.4.7 SWMU 39-007(a)

The industrial cancer risk of 4×10^{-5} exceeds the NMED target level of 1×10^{-5} (NMED 2009, 106420). The industrial HI of 0.002 is below the NMED target HI of 1.0 (NMED 2009, 106420). The residential cancer risk of 3×10^{-5} exceeds NMED target level of 1×10^{-5} (NMED 2009, 106420). The residential HI of 2.3 exceeds the NMED target HI (NMED 2009, 106420). No radionuclide COPCs were identified at this site.

Based on the results of the risk-screening assessments, there is potential unacceptable risk under the industrial scenario from Aroclor-1254 and Aroclor-1260. There is also potential unacceptable risk from Aroclor-1254 and Aroclor-1260 and hazard from Aroclor-1254 under the residential scenario.

H-4.4.8 AOC 39-007(d)

The industrial cancer risk of 1×10^{-6} is below the NMED target level of 1×10^{-5} (NMED 2009, 106420). The industrial HI of 0.007 is below the NMED target HI of 1.0 (NMED 2009, 106420). The industrial dose of 0.01 mrem/yr is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The residential cancer risk of 6×10^{-6} is below NMED target level of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.4 is below the NMED target HI of 1.0 (NMED 2009, 106420). The residential dose of 0.08 mrem/yr is 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 8×10^{-11}, based on a comparison with EPA's outdoor worker PRGs for radionuclides (available 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^{-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).

Based on the results of the risk-screening assessments, there are no potential unacceptable risks and doses from COPCs for the industrial and residential scenarios.

H-4.4.9 SWMU 39-010

The industrial cancer risk of 7×10^{-7} is below the NMED target level of 1×10^{-5} (NMED 2009, 106420). The industrial HI of 0.06 is below the NMED target HI of 1.0 (NMED 2009, 106420). The industrial dose of 1.3 mrem/yr is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The residential cancer risk of 1×10^{-5} is equivalent to the NMED target level of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.4 is below the NMED target HI of 1.0 (NMED 2009, 106420). The residential dose of 6.1 mrem/yr is 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^{-10}, based on a comparison with EPA's outdoor worker PRGs for radionuclides (available 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 4×10^{-5}, 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).

Based on the results of the risk-screening assessments, there are no potential unacceptable risks and doses from COPCs for the industrial and residential scenarios.

H-4.4.10 Extended Drainages

The recreational cancer risk of 1×10^{-6} is below the NMED target level of 1×10^{-5} (NMED 2009, 106420). The recreational HI of 0.07 is below the NMED target HI of 1.0 (NMED 2009, 106420). The recreational dose of 0.11 mrem/yr is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The residential cancer risk of 9×10^{-6} is below the NMED target level of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.4 is below the NMED target HI of 1.0 (NMED 2009, 106420). The residential dose of 2.3 mrem/yr is 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^{-9}, based on a conversion in RESRAD. The total dose for the residential scenario is equivalent to a total risk of 7×10^{-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).

Based on the results of the risk-screening assessments, there are no potential unacceptable risks and doses from COPCs for the recreational and residential scenarios.

H-4.4.11 SWMU 39-001(b)

The residential cancer risk of 2×10^{-6} is below NMED target level of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.2 is below the NMED target HI of 1.0 (NMED 2009, 106420). The residential dose of 0.04 mrem/yr 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 3×10^{-8}, 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).

Based on the results of the risk-screening assessments, there is no potential unacceptable risk and dose from COPCs for the residential scenario.

H-4.4.12 SWMU 39-006(a) Inactive Components

The residential cancer risk of 2×10^{-7} is below NMED target level of 1×10^{-5} (NMED 2009, 106420). The residential HI of 0.3 is below the NMED target HI of 1.0 (NMED 2009, 106420). The residential dose of 0.87 mrem/yr 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 6×10^{-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).

Based on the results of the risk-screening assessments, there is no potential unacceptable risk and dose from COPCs for the residential scenario.

H-5.0 ECOLOGICAL RISK SCREENING

H-5.1 Scoping Evaluation

The scoping evaluation establishes the breadth and focus of the screening evaluation. The ecological scoping checklists (Attachment H-3) are a useful tool for organizing existing ecological information. The information was used to determine whether ecological receptors might be affected, to identify the types of receptors that might be present, and to develop the ecological CSM for the North Ancho Canyon Aggregate Area (Figure H-3.1-1). The sites considered in this investigation of the North Ancho Canyon Aggregate Area were visited, and an ecological scoping checklist was prepared for each group of sites. The completely paved sites were grouped for one checklist (only the scoping visit portion of this checklist was completed), the two remote outdoor storage areas were grouped on one checklist, and the remaining sites each had a checklist. Checklists were not completed for SWMU 39-001(a) because this site requires further remediation and sampling, and for SWMU 39-001(b) because either all material in the 0- to 5-ft depth was excavated and replaced by clean fill. No checklists were completed for the active sites; they were excluded from the risk-screening assessments because they were only undergoing limited sampling for preliminary characterization.

All of the sites in the North Ancho Canyon Aggregate Area lie within the canyon bottom. The ecological setting varies somewhat between sites but is generally a vegetated field with scattered shrubs and/or ponderosa pines. The ephemeral surface water channel (the extended drainages) runs adjacent to or through many of the sites, but carries water very infrequently only after intense summer storms and snowmelt. A paved road traverses the center of the canyon bottom; the road connects the various firing sites and operations areas. Because of their rural nature, the sites provide habitat for a large number of species, particularly birds. Larger mammals (bobcats, coyote, and deer) also visit the less developed area of the canyon. Areas farther up the canyon lie within the habitat for the Mexican spotted owl, but the designated habitat for this threatened and endangered (T&E) species does not extend down to the areas under investigation. Much of the area is open vegetated ground or exposed soil/sediment (in the channel); therefore, direct exposure pathways from soil to receptors and indirect pathways through uptake into plants and animals do exist at the North Ancho Canyon Aggregate Area sites.

The potential risk was evaluated in the screening assessments for the following ecological receptors representing several trophic levels:

- plant
- soil-dwelling invertebrates (represented by the earthworm)
- deer mouse (mammalian omnivore)
- montane shrew (mammalian insectivore)
- desert cottontail (mammalian herbivore)
- red fox (mammalian carnivore)
- American robin (avian insectivore, avian omnivore, and avian herbivore)
- American kestrel (avian intermediate carnivore and avian carnivore (surrogate for T&E species [primarily the Mexican spotted owl]).

The rationale for these receptors is presented in “Screening Level Ecological Risk Assessment Methods, Revision 2” (LANL 2004, 087630).

H-5.2 Assessment Endpoints

An assessment endpoint is an explicit expression of the environmental value to be protected. The endpoints are ecologically relevant and help sustain the natural structure, function, and biodiversity of an ecosystem or its components (EPA 1998, 062809). In a screening-level ecological evaluation, receptors represent the populations and/or communities, and assessment endpoints are any adverse effects on the chosen ecological receptors. The purpose of the ecological evaluation is to protect populations and communities of biota rather than individual organisms, except for listed or candidate T&E species and treaty-protected species, when individuals must be protected (EPA 1999, 070086) because populations of protected species tend to be small and the loss of an individual adversely affects the species as a whole (EPA 1997, 059370).

In accordance with this guidance, the Laboratory has developed generic assessment endpoints (LANL 1999, 064137) to ensure that values at all levels of ecological organization are considered in the ecological screening process. 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 functional group. The receptor species were chosen because of their presence at the site, their sensitivity to the COPCs, and

their potential for exposure to those COPCs. These categories of effects and the chosen receptor species were used 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 studies in which the adverse effect evaluated affected reproduction, survival, and/or growth.

The selection of receptors and assessment endpoints is 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 the applicability to the ecosystem of concern.

H-5.3 Screening Evaluation

The ecological risk-screening evaluation identifies chemicals of potential ecological concern (COPECs) and is based on the comparison of EPCs to ecological screening levels (ESLs) in accordance with Laboratory guidance (LANL 2004, 087630). The EPCs used in the assessment are presented in Tables H-2.3-3, H-2.3-5, H-2.3-7, H-2.3-9, H-2.3-12, H-2.3-14, H-2.3-16, H-2.3-18, H-2.3-20, H-2.3-21, and H-2.3-23. ESLs obtained from the ECORISK Database, Version 2.3 (LANL 2008, 103352) are presented in Table H-5.3-1. The ESLs are based on similar species and are derived from experimentally determined NOAELs, lowest-observed-adverse-effect levels (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 HQs calculated for each COPEC and screening receptor are the ratios of the EPC to the ESLs 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.

H-5.3.1 SWMU 39-002(a) Area 1

The HQ using the minimum ESL exceeded 0.3 for antimony, cadmium, copper, cyanide, lead, mercury, thallium, zinc, and 11 organic chemicals, as presented in Table H-5.3-2. The 8 inorganic chemicals and 11 organic chemicals were retained as COPECs. Perchlorate, dichlorobenzene[1,2-], ethylbenzene, iodomethane, and trimethylbenzene[1,2,4-] were retained as a COPECs because these COPCs have no ESLs. These COPECs are discussed further in the uncertainty analysis.

An HQ for each COPEC/receptor combination was calculated and summed to obtain an HI for each receptor. The HI is the sum of HQs for chemicals with common toxicological endpoints for a given receptor. It is assumed for the purposes of ecological screening, that nonradionuclides have common toxicological effects and that HQs may be added. All receptors have HIs greater than 1.0 (Table H-5.3-3).

H-5.3.2 SWMU 39-002(a) Area 3

SWMU 39-002(a) Area 3 and the surrounding area are covered with asphalt and are inaccessible to ecological receptors, and no complete exposure pathways to ecological receptors exist. This site is expected to remain paved under continued use as an active portion of the facility. However, an ecological risk-screening assessment is presented for this site. The HQ using the minimum ESL exceeded 0.3 for antimony, copper, cyanide, Aroclor-1254, bis(2-ethylhexyl)phthalate, di-n-butyl phthalate, and TCDD[2,3,7,8-] equivalent as shown in Table H-5.3-4. The three inorganic chemicals and four organic chemicals were retained as COPECs. Iodomethane and trichlorofluoromethane were retained as COPECs because these COPCs have no ESLs. These COPECs are discussed further in the uncertainty analysis.

An HQ for each retained COPEC/receptor combination was calculated and summed to obtain an HI for each receptor. The HI is the sum of HQs for chemicals with common toxicological endpoints for a given receptor. It is assumed for the purposes of ecological screening, that nonradionuclides have common toxicological effects, and that HQs may be added. The kestrel (top carnivore), the kestrel (intermediate carnivore), robin (all feeding guilds), deer mouse, shrew, and red fox have HIs greater than 1.0. The cottontail, earthworm, and plant have HIs less than 1.0. The results of the HQ/HI analysis are presented in Table H-5.3-5.

H-5.3.3 AOC 39-002(c)

The HQ using the minimum ESL exceeded 0.3 for antimony, cadmium, copper, cyanide, mercury, zinc, Aroclor-1254, and TCDD[2,3,7,8-] equivalent as shown in Table H-5.3-6. The six inorganic chemicals and two organic chemicals were retained as COPECs.

An HQ for each retained COPEC/receptor combination was calculated and summed to obtain an HI for each receptor. The HI is the sum of HQs for chemicals with common toxicological endpoints for a given receptor. It is assumed for the purposes of ecological screening that nonradionuclides have common toxicological effects and that HQs may be added. The kestrel (intermediate carnivore), robin (all feeding guilds), deer mouse, and shrew have HIs greater than 1.0. The kestrel (top carnivore), cottontail, earthworm, plant, and red fox have HIs less than 1.0. The results of the HQ/HI analysis are presented in Table H-5.3-7.

H-5.3.4 AOC 39-002(f)

AOC 39-002(f) and the surrounding area are covered with asphalt and are inaccessible to ecological receptors, and no complete exposure pathways to ecological receptors exist. This site is expected to remain paved under continued use as an active portion of the facility. However, an ecological risk-screening assessment is presented for this site. The HQ using the minimum ESL exceeded 0.3 for antimony and copper as shown in Table H-5.3-8. The two inorganic chemicals were retained as COPECs.

An HQ for each retained COPEC/receptor combination was calculated and summed to obtain an HI for each receptor. The HI is the sum of HQs for chemicals with common toxicological endpoints for a given receptor. It is assumed for the purposes of ecological screening that nonradionuclides have common toxicological effects and that HQs may be added. The deer mouse, plant, and shrew have HIs greater than 1.0. The kestrel (top carnivore), kestrel (intermediate carnivore), robin (all feeding guilds), cottontail, earthworm, and red fox have HIs less than 1.0. The results of the HQ/HI analysis are presented in Table H-5.3-9.

H-5.3.5 SWMU 39-004(c)

Based on the approved work plan (LANL 2007, 098280, p. vi), an interim sampling strategy was proposed to identify COPCs, to determine if contaminants are migrating, and to confirm active firing activities are dispersing the same contaminants as those dispersed by historical firing activities. That information for this site is presented in Appendix B. No screening for ecological risk was conducted for the active sites.

H-5.3.6 SWMU 39-004(d)

Based on the approved work plan (LANL 2007, 098280, p. vi), an interim sampling strategy was proposed to identify COPCs, to determine if contaminants are migrating, and to confirm active firing activities are dispersing the same contaminants as those dispersed by historical firing activities. That information for this site is presented in Appendix B. No screening for ecological risk was conducted for the active sites.

H-5.3.7 SWMU 39-005

The HQ using the minimum ESL exceeded 0.3 for chromium, copper, cyanide, nickel, mercury, selenium, acenaphthene, and TCDD[2,3,7,8-] equivalent as shown in Table H-5.3-10. The six inorganic chemicals and two organic chemicals were retained as COPECs. Bromomethane, dinitroaniline[3,5-], hexanone[2-], and isopropyltoluene[4-] were retained as COPECs because they had no ESLs. These COPECs are discussed further in the uncertainty analysis.

An HQ for each retained COPEC/receptor combination was calculated and summed to obtain an HI for each receptor. The HI is the sum of HQs for chemicals with common toxicological endpoints for a given receptor. It is assumed for the purposes of ecological screening, that nonradionuclides have common toxicological effects and that HQs may be added. The kestrel (intermediate carnivore), the kestrel (top carnivore), robin (all feeding guilds), deer mouse, earthworm, plant, and shrew have HIs greater than 1.0. The cottontail and red fox have HIs less than 1.0. The results of the HQ/HI analysis are presented in Table H-5.3-11.

H-5.3.8 SWMU 39-006(a) Active Components

The outfall area of the active septic system was sampled to provide initial characterization of nature and extent. This is an active septic system; however, an ecological risk-screening assessment is presented for this site. The HQ using the minimum ESL exceeded 0.3 for mercury, bis(2-ethylhexyl)phthalate, and TCDD[2,3,7,8-] equivalent as shown in Table H-5.3-12. The one inorganic chemical and the two organic chemicals were retained as COPECs.

An HQ for each retained COPEC/receptor combination was calculated and summed to obtain an HI for each receptor. The HI is the sum of HQs for chemicals with common toxicological endpoints for a given receptor. It is assumed for the purposes of ecological screening that nonradionuclides have common toxicological effects and that HQs may be added. The kestrel (top carnivore), kestrel (intermediate carnivore), robin (all feeding guilds), and earthworm have HIs greater than 1.0. The, cottontail, deer mouse, plant, shrew, and red fox have HIs less than 1.0. The results of the HQ/HI analysis are presented in Table H-5.3-13.

H-5.3.9 SWMU 39-007(a)

The HQ using the minimum ESL exceeded 0.3 for antimony, cadmium, cyanide, Aroclor-1242, Aroclor-1248, Aroclor-1254, Aroclor-1260, and bis(2-ethylhexyl)phthalate as shown in Table H-5.3-14.

The three inorganic chemicals and five organic chemicals were retained as COPECs. Perchlorate, ethylbenzene, isopropylbenzene, and isopropyltoluene[4-] were retained as COPECs because they have no ESLs. These COPCs are discussed further in the uncertainty analysis.

An HQ for each retained COPEC/receptor combination was calculated and summed to obtain an HI for each receptor. The HI is the sum of HQs for chemicals with common toxicological endpoints for a given receptor. It is assumed for the purposes of ecological screening, that nonradionuclides have common toxicological effects and that HQs may be added. The kestrel (intermediate carnivore), the kestrel (top carnivore), robin (all feeding guilds), deer mouse, plant, red fox, and shrew have HIs greater than 1.0. The cottontail and earthworm have HIs less than 1.0. The results of the HQ/HI analysis are presented in Table H-5.3-15.

H-5.3.10 AOC 39-007(d)

The HQ using the minimum ESL exceeded 0.3 for antimony, cyanide, cadmium, zinc, Aroclor-1242, Aroclor-1254, bis(2-ethylhexyl)phthalate, methylnaphthalene[2-], and phenanthrene as shown in Table H-5.3-16. The four inorganic and five organic chemicals were retained as COPECs. Perchlorate, bromomethane, diphenylamine, isopropyltoluene[4-], trichlorofluoromethane, trimethylbenzene[1,2,4-], and trimethylbenzene[1,3,5-] were retained as COPECs because they have no ESLs. These COPCs are discussed further in the uncertainty analysis.

An HQ for each retained COPEC/receptor combination was calculated and summed to obtain an HI for each receptor. The HI is the sum of HQs for chemicals with common toxicological endpoints for a given receptor. It is assumed for the purposes of ecological screening, that nonradionuclides have common toxicological effects and that HQs may be added. The kestrel (intermediate carnivore), the kestrel (top carnivore), robin (all feeding guilds), deer mouse, earthworm, red fox, and shrew have HIs greater than 1.0. The cottontail and plant have HIs less than 1.0. The results of the HQ/HI analysis are presented in Table H-5.3-17.

H-5.3.11 SWMU 39-008

Based on the approved work plan (LANL 2007, 098280, p. vi), an interim sampling strategy was proposed to identify COPCs, to determine if contaminants are migrating, and to confirm that active firing activities are dispersing the same contaminants as those dispersed by historical firing activities. That information for this site is presented in Appendix B. No screening for ecological risk was conducted for the active sites.

H-5.3.12 SWMU 39-010

The HQ using the minimum ESL exceeded 0.3 for antimony, barium, chromium, copper, lead, manganese, mercury, nickel, vanadium, zinc, Aroclor-1254, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, RDX, uranium-238, and TCDD[2,3,7,8-] equivalent as shown in Table H-5.3-18. The 10 inorganic chemicals, 5 organic chemicals, and 1 radionuclide were retained as COPECs. Perchlorate, chloromethane, hexanone[2-], and trimethylbenzene[1,3,5-] were retained as COPECs because they have no ESLs. These COPCs are discussed further in the uncertainty analysis.

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 average soil pH in the North Ancho Canyon Aggregate Area is 6.9.

An HQ for each retained COPEC/receptor combination was calculated and summed to obtain an HI for each receptor. The HI is the sum of HQs for chemicals with common toxicological endpoints for a given receptor. It is assumed for the purposes of ecological screening that nonradionuclides have common toxicological effects and that HQs may be added. All receptors have HIs greater than 1.0. The results of the HQ/HI analysis are presented in Table H-5.3-19.

H-5.3.13 Extended Drainages

The HQ using the minimum ESL exceeded 0.3 for antimony, cadmium, copper, cyanide, lead, mercury, selenium, zinc, Aroclor-1254, Aroclor-1260, bis(2-ethylhexy)phthalate, and di-n-butyl phthalate as shown in Table H-5.3-20. The eight inorganic and four organic chemicals were retained as COPECs for further investigation. Perchlorate, chloromethane, and trimethylbenzene[1,3,5-] were retained as COPECs because they have no ESLs. These COPCs are discussed further in the uncertainty analysis.

An HQ for each retained COPEC/receptor combination was calculated and summed to obtain an HI for each receptor. The HI is the sum of HQs for chemicals with common toxicological endpoints for a given receptor. It is assumed for the purposes of ecological screening that nonradionuclides have common toxicological effects and that HQs may be added. The kestrel (intermediate carnivore), the kestrel (top carnivore), robin (all feeding guilds), deer mouse, earthworm, plant, and shrew have HIs greater than 1.0. The cottontail and red fox have HIs less than 1.0. The results of the HQ/HI analysis are presented in Table H-5.3-21.

H-5.3.14 SWMU 39-001(a)

The extent of contamination has not been defined, and additional remediation is necessary at this site. Therefore, no ecological risk-screening assessment was conducted for this site.

H-5.3.15 SWMU 39-001(b)

No samples were collected in the 0–5 ft depth at SWMU 39-001(b) because all material in this depth range and deeper was removed as part of the excavation and replaced with clean fill or stockpiled dirt analyzed to ensure it is below residential SSLs. Therefore, no ecological risk-screening assessment was conducted for this site.

H-5.3-16 SWMU 39-006(a) Inactive Components

The HQ using the minimum ESL exceeded 0.3 for cadmium, cyanide, silver, Aroclor-1254, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, and phenol as shown in Table H-5.3-22. The three inorganic and four organic chemicals were retained as COPECs. Perchlorate, iodomethane, and isopropyltoluene[4-] were retained as COPECs because they have no ESLs. These COPCs are discussed further in the uncertainty analysis.

An HQ for each retained COPEC/receptor combination was calculated and summed to obtain an HI for each receptor. The HI is the sum of HQs for chemicals with common toxicological endpoints for a given receptor. It is assumed for the purposes of ecological screening that nonradionuclides have common toxicological effects and that HQs may be added. The kestrel (intermediate carnivore), the kestrel (top carnivore), and the robin (all feeding guilds) have HIs greater than 1.0. The deer mouse, cottontail, earthworm, plant, shrew, and red fox all have HIs less than 1.0. The results of the HQ/HI analysis are presented in Table H-5.3-23.

H-5.4 Uncertainty Analysis

H-5.4.1 Chemical Form

The assumptions used in the ESL derivations are 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. These factors tend to result in conservative ESL estimates, 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 the investigation. Toxicological data are typically based on the most toxic and bioavailable chemical species, which are not typically found in the environment. Inorganic, organic, and radionuclide COPECs are generally not 100% bioavailable to receptors in the natural environment because of interference from other natural processes, such as the adsorption of chemical constituents to matrix surfaces (e.g., soil) 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.

H-5.4.2 Exposure Assumptions

The EPCs used in the calculations of HQs are the UCL or the maximum detected concentration in the soil/fill/tuff to a depth of 5 ft bgs. At SWMU 39-005 and the excavated sites, samples were collected at depths below 5 ft bgs. At those sites, only analytical results from samples collected in the 0–5 ft bgs interval were used to develop the EPCs. These EPCs are conservative estimates of exposure to each COPC. The sampling efforts focused on areas of known contamination, and receptors were assumed to ingest 100% of their food and spend 100% of their time at the site. These assumptions regarding the exposure for terrestrial receptors in the North Ancho Canyon Aggregate Area are likely to result in an overestimation of potential ecological exposure and risk.

H-5.4.3 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, possibly 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.

H-5.4.4 Comparison of EPCs to Background Concentrations

The ecological risk-screening assessments are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPCs of some of the inorganic COPECs are similar to

background concentrations, indicating that exposure of receptors to these inorganic chemicals is similar to background.

SWMU 39-002(a) Area 1

The EPCs for cadmium, thallium, and zinc are similar to background concentrations for soil, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table H-5.4-1). Cadmium, thallium, and zinc are not retained as COPECs because the EPCs are similar to background. Antimony, copper, cyanide, lead, and mercury are retained as COPECs for further evaluation.

SWMU 39-002(a) Area 3

The EPC for antimony and cyanide is similar to background concentrations for soil, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table H-5.4-2). Antimony and cyanide are not retained as COPECs because the EPCs are similar to background. Copper is retained as a COPEC for further evaluation.

AOC 39-002(c)

The EPCs for antimony, cadmium, copper, cyanide, mercury, and zinc are similar to background concentrations for soil, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table H-5.4-3). Antimony, cadmium, copper, cyanide, mercury, and zinc are not retained as COPECs for further evaluation because the EPCs are similar to background.

AOC 39-002(f)

The EPCs for antimony and copper are similar to background concentrations for soil, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table H-5.4-4). Antimony and copper are not retained as COPECs for further evaluation because the EPCs are similar to background.

SWMU 39-005

The EPCs for chromium, copper, cyanide, mercury, nickel, and selenium are similar to background concentrations for soil and for tuff, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table H-5.4-5). Chromium, copper, cyanide, mercury, nickel, and selenium are not retained as COPECs because the EPCs are similar to background. Mercury is retained as a COPEC for further evaluation.

SWMU 39-006(a) Active Components

The EPC for mercury is not similar to background concentrations for soil (Table H-5.4-6). Mercury is retained as a COPEC for further evaluation.

SWMU 39-007(a)

The EPCs for antimony, cadmium, and cyanide are similar to background concentrations for soil, indicating that exposure of receptors to these inorganic chemicals is similar to background

(Table H-5.4-7). Antimony, cadmium, and cyanide are not retained as COPECs because the EPCs are similar to background.

AOC 39-007(d)

The EPCs for antimony, cadmium, cyanide, and zinc are similar to background concentrations for soil, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table H-5.4-8). Antimony, cadmium, cyanide, and zinc are not retained as COPECs because the EPCs are similar to background.

SWMU 39-010

The EPCs for antimony, arsenic, barium, cadmium, chromium, lead, manganese, nickel, vanadium, and zinc are similar to background concentrations for soil, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table H-5.4-9). Antimony, arsenic, barium, cadmium, chromium, lead, manganese, nickel, vanadium, and zinc are not retained as COPECs because the EPCs are similar to background. Mercury and copper were retained as COPECs for further evaluation.

Extended Drainages

The EPCs for cadmium, cyanide, lead, and zinc are similar to background concentrations for soil and sediment, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table H-5.4-10). Cadmium, cyanide, lead, and zinc are not retained as COPECs because the EPCs are similar to background. Antimony was not detected but had detection limits above background. Two detection limits are around 5 mg/kg, but the remaining detection limits range from 1 mg/kg to 1.2 mg/kg. These lower detection limits are similar to background concentrations for soil and sediment. Therefore, antimony is also not retained as a COPEC because the majority of the elevated detection limits are similar to background. Mercury and copper were retained as COPECs for further evaluation.

SWMU 39-006(a) Inactive Components

The EPC for cadmium and silver is similar to background concentrations for soil, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table H-5.4-11). Cadmium and silver are not retained as COPECs because the EPCs are similar to background. Cyanide is retained as a COPEC for further evaluation.

H-5.4.5 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 HIs for the kestrel (top carnivore) are above 1.0 for all sites, except for SWMUs 39-002(c) and 39-002(f).

The HR for the Mexican spotted owl is 366 ha, and the site areas are presented in Table H-5.4-12. The AUFs for the Mexican spotted owl range from 0.0000002 to 0.03. Application of the AUFs for the Mexican spotted owl to the HQs for the kestrel (top carnivore) results in adjusted HIs from 0.000000002 to 0.07. Therefore, there is no potential adverse impacts to the Mexican spotted owl.

H-5.4.6 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 address 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 a receptor is based on the individual receptor HR 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, which is equivalent to 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 ($R2 = 0.91$) (Bowman et al. 2002, 073475). If it is assumed that the receptors can disperse 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 can be derived by $\pi(3.6\sqrt{HR})^2$ or approximately 40 HR.

Population area use factors (PAUFs) are estimated by dividing the area investigated by the population area of each receptor population (Table H-5.4-12). The HQs are recalculated minus the COPECs eliminated based on similarity to background (section H-5.4.4) and adjusted by multiplying by the PAUFs. If the PAUF is greater than 1, the HQ is not adjusted. The HQs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs. The adjusted HQs are summed for each receptor to calculate the adjusted HI.

SWMU 39-002(a) Area 1

The adjusted HQs and HIs are presented in Table H-5.4-13. All the adjusted HIs are less than 1.0, except for the earthworm (15) and the plant (52). Mercury is the primary COPEC for the earthworm, and antimony is the major contributor to the elevated HI for the plant. The antimony EPC is the only detected concentration reported at this site. The plant community was evaluated during the site visit. No evidence of adverse impacts of contamination to the plant community next to the site was found based on field observations during site visits (Attachment H-2); the plant community is typical of the surrounding area and appears healthy. No marked differences in vegetation were observed between this site and the sites with similar topography that did not have elevated HIs. The mercury ESL (0.05 mg/kg) for the earthworm is less than background and overestimates potential risk. If the mercury background value (BV) of 0.1 mg/kg is used, the HI is reduced by half. In addition, because the plant community does not appear affected by the COPECs, the earthworm population is also likely not affected. Therefore, no COPECs are retained at this site.

SWMU 39-002(a) Area 3

The PAUF-adjusted HQs and HIs are presented in Table H-5.4-14. All the adjusted HIs are less than 1.0. Therefore, no COPECs are retained at this site.

SWMU 39-002(c)

The adjusted HIs for all receptors are less than or equivalent to 1.0 (Table H-5.4-15). Therefore, no COPECs are retained at this site.

SWMU 39-005

The adjusted HQs and HIs are presented in Table H-5.4-16. All of the adjusted HIs are less than or equivalent to 1.0, except for the earthworm (14). Mercury is the primary COPEC for the earthworm. The

plant community was evaluated at this site during the site visit. No evidence of adverse impacts of contamination to the plant community based on field observations was found during site visits (Attachment H-2); the plant community is typical of the surrounding area and appears healthy. No marked differences in vegetation were observed between this site and the sites with similar topography that did not have elevated HIs. The mercury ESL (0.05 mg/kg) for the earthworm is less than background and overestimates potential risk. If the mercury BV of 0.1 mg/kg is used the HI is reduced by half. In addition, because the plant community does not appear affected by the COPECs, the earthworm population is also likely not affected. 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, no COPECs are retained at this site.

SWMU 39-006(a) Active Components

The adjusted HQs and HIs are presented in Table H-5.4-17. All of the adjusted HIs are less than 1, except for the earthworm. The earthworm HI (13) was from mercury. The mercury EPC was the maximum detected concentration and the only concentration above background. In addition, the mercury ESL (0.05 mg/kg) for the earthworm is less than background and overestimates potential risk. If the mercury BV of 0.1 mg/kg is used the HI is reduced by half. In addition, because the plant community does not appear affected by the COPECs, the earthworm population is also likely not affected. 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, no COPECs are retained at this site.

SWMU 39-007(a)

The adjusted HQs and HIs are presented in Table H-5.4-18. All the adjusted HIs are less than 1. Therefore, no COPECs are retained at this site.

AOC 39-007(d)

The adjusted HQs and HIs are presented in Table H-5.4-19. All the adjusted HIs are less than or equivalent to 1.0. Therefore, no COPECs are retained at this site.

SWMU 39-010

The adjusted HQs and HIs are presented in Table H-5.4-20. The adjusted HIs are above 1.0 for the robin (omnivore and insectivore), deer mouse, earthworm, and plant. The adjusted HIs are less than or equivalent to 1.0 for the other receptors. Copper is the primary COPEC contributing to the elevated HIs for these receptors. The adjusted HIs for the robin (omnivore and insectivore) and the deer mouse are 8, 5, and 4, respectively, and the earthworm and plant HIs are 21 and 8, respectively. The plant community was evaluated at this site during the site visit. No evidence of adverse impacts of contamination to the plant community based on field observations was found during site visits (Attachment H-2); the plant community is typical of the surrounding area and appears healthy. No marked differences in vegetation were observed between this site and the sites with similar topography that did not have elevated HIs. The mercury ESL (0.05 mg/kg) for the earthworm is less than background and overestimates potential risk. If the mercury BV of 0.1 mg/kg is used, the HI is reduced by half. In addition, because the plant community

does not appear to be affected by the COPECs, the earthworm population is also probably not affected. 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 elevated HIs overestimate the risk to receptors and no COPECs are retained at this site.

Extended Drainages

The adjusted HQs and HIs are presented in Table H-5.4-21. The adjusted HIs are less than or equivalent to 1.0 for the kestrel (intermediate carnivore), kestrel (top carnivore), desert cottontail, red fox, and plant. The adjusted HIs for the robin (all feeding guilds), deer mouse, shrew, and earthworm are above 1.0. The HIs for the deer mouse and shrew are below 3. Dourson and Stara (LANL 2004, 087390) 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.

The adjusted HQs for the extended drainages for the remaining receptors exceed 1.0. The COPCs driving the ecological risk are copper, mercury, bis(2-ethylhexyl)phthalate, and di-n-butylphthalate. The EPCs for these four COPECs are similar to the concentrations reported in canyon reaches in the biota investigations conducted in the canyon reaches in Los Alamos and Pueblo Canyons (LANL 2004, 087390); Mortandad Canyon (LANL 2006, 094161; LANL 2007, 098279); and Pajarito Canyon (LANL 2008, 104909; LANL 2009, 106771). No adverse ecological effects to small mammals, birds, plants and earthworms were found in those studies. In addition, bis(2-ethylhexyl)phthalate, and di-n-butyl phthalate were detected relatively infrequently and the maximum detected concentrations served as the EPCs for the entire extended drainages. The infrequent detection and use of the maximum detected concentrations substantially overestimates exposure and does not reflect the actual risk to receptors. Therefore, no COPECs are retained for further analysis for this site.

SWMU 39-006(a) Inactive Components

The adjusted HQs and HIs are presented in Table H-5.4-22. All of the adjusted HIs are less than 1.0. Therefore, no COPECs are retained for further analysis for this site.

H-5.4.7 Comparison to DOE Tier I Biota Concentration Guide

The DOE Tier I Biota Concentration Guide (BCG) is a lower value for cesium-137 (20.8 pCi/g) than the ECORISK Database final ESL (680 pCi/g). Cesium-137 was a COPC at SWMUs 39-010 and 39-006(a) inactive components. Using the EPC for cesium-137 for each of these sites and the DOE Tier I BCG, the HQs for these sites 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 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.

H-5.4.8 Comparison with Results of Previous Field and Laboratory Studies

Biota investigations have been conducted in canyon reaches in Los Alamos and Pueblo Canyons (LANL 2004, 087390); Mortandad Canyon (LANL 2006, 094161; LANL 2007, 098279); and Pajarito Canyon

(LANL 2008, 104909; LANL 2009, 106771). 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); laboratory testing of sensitive organisms; and seedling germination tests.

The field and laboratory results on small mammals, birds, earthworms, and plants included reaches with similar COPEC concentrations as the EPCs for the sites within the North Ancho Canyon Aggregate Area. The studies found no effects from exposure to COPECs in any of the canyon reaches supporting the conclusion that no potential ecological risk exists at these sites.

H-5.4.9 COPECs without ESLs

Several COPECs do not have ESLs for any receptor in the current version of the ECORISK Database, Version 2.3 (LANL 2008, 103352) because relevant toxicity data for these chemicals have 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 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, U.S. Department of Agriculture (USDA) Integrated Pesticide Management Database, American Bird Conservancy Pesticide Toxicity Database, and Oak Ridge National Laboratory Risk Assessment Information System. Toxicity data were 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, the data 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 chemical-specific ESLs, 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).

SWMU 39-002(a) Area 1

No ESLs are available in the current version of the ECORISK Database, Version 2.3 (LANL 2008, 103352) for perchlorate; dichlorobenzene[1,2-]; ethylbenzene; iodomethane; TPH-DRO; and trimethylbenzene[1,2,4-]. However, dichlorobenzene[1,2-] and iodomethane have interim ESLs for at least one receptor based on toxicity information from the EPA ECOTOX Database and USDA Integrated Pesticide Management Database, respectively. Ethylbenzene and trimethylbenzene[1,2,4-] have surrogate ESLs for a structurally related compound (benzene) in the current version of the ECORISK Database. Nitrate, perchlorate, and TPH-DRO do not have interim or surrogate ESLs, and are assessed qualitatively.

The minimum interim ESL for iodomethane [0.1 mg/kg for the robin (herbivore)] is used to screen the iodomethane EPC (0.00081 mg/kg) and results in a maximum HQ of 0.0008. Because this HQ is less than 0.3, iodomethane is eliminated as a COPEC.

The minimum interim ESL for dichlorobenzene[1,2-] (0.92 mg/kg for the shrew) is used to screen the dichlorobenzene[1,2-] EPC (0.0007 mg/kg) and results in a maximum HQ of 0.0081. Because this HQ is less than 0.3, dichlorobenzene[1,2-] is eliminated as a COPEC.

Ethylbenzene was detected in one sample with a maximum detected concentration of 0.00072 mg/kg. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the ethylbenzene EPC (0.00072 mg/kg) and results in a maximum HQ of 0.00003. Because this HQ is less than 0.3, ethylbenzene is eliminated as a COPEC.

Trimethylbenzene[1,2,4-] was detected in one sample with a maximum detected concentration of 0.00047 mg/kg. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the trimethylbenzene[1,2,4-] EPC (0.00047 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.

Perchlorate was detected in one sample with a maximum detected concentration of 0.00072 mg/kg. The NMED residential SSL for perchlorate is 54.8 mg/kg, indicating that potential toxicity is low. Because of the infrequent detection and the potentially low toxicity, perchlorate is eliminated as a COPEC.

TPH-DRO was detected in 13 samples a maximum detected concentration of 170 mg/kg. The NMED residential screening guideline for diesel fuel #2/crankcase oil is 520. Because the maximum detected concentration is below the screening guideline, TPH-DRO is infrequently detected, and the potential components of the TPH have been evaluated separately in the screening assessment, TPH-DRO is eliminated as a COPEC.

Based these assessments, no COPECs remain at this SWMU, and there is no potential ecological risk to receptors.

SWMU 39-005

No ESLs are available in the current version of the ECORISK Database, Version 2.3 (LANL 2008, 103352) for bromomethane; dinitroaniline [3,5-]; hexanone[2-]; and isopropyltoluene[4-]. In addition, no toxicity data were found as a result of the online database searches. However, hexanone[2-] and isopropyltoluene[4-] have surrogate ESLs for structurally related compounds (butanone[2-] and toluene, respectively) in the current version of the ECORISK Database. Bromomethane and dinitroaniline[3,5-] do not have interim or surrogate ESLs and are assessed qualitatively.

Hexanone[2-] was detected in one sample with a maximum detected concentration of 0.026 mg/kg. The minimum ESL for butanone[2-] (360 mg/kg for the deer mouse) is used to screen the hexanone[2-] EPC (0.026 mg/kg) and results in a maximum HQ of 0.00007. Because this HQ is less than 0.3, hexanone[2-] is eliminated as a COPEC.

Isopropyltoluene[4-] was detected in two samples with a maximum detected concentration of 0.028 mg/kg. The minimum ESL for toluene (23 mg/kg for the shrew) is used to screen the isopropyltoluene[4-] EPC (0.028 mg/kg) and results in a maximum HQ of 0.001. Because this HQ is less than 0.3, isopropyltoluene[4-] is eliminated as a COPEC.

Bromomethane was detected in four samples with a maximum detected concentration of 0.00058 mg/kg. The NMED residential SSL for bromomethane is 22.3 mg/kg, indicating that potential toxicity is low. Because of the infrequent detection and the potentially low toxicity, bromomethane is eliminated as a COPEC.

Dinitroaniline[3,5-] was detected in two samples with a maximum detected concentration of 0.0071 mg/kg. There are no NMED or EPA residential SSLs for dinitroaniline[3,5-]. Because of the infrequent detection and low concentrations, dinitroaniline[3,5-] is eliminated as a COPEC.

Based these assessments, no COPECs remain at this SWMU and there is no potential ecological risk to receptors.

SWMU 39-007(a)

No ESLs are available in the current version of the ECORISK Database, Version 2.3 (LANL 2008, 103352) for nitrate, perchlorate, ethylbenzene, isopropylbenzene, and isopropyltoluene[4-]. In addition, no toxicity data were found as a result of the online database searches. However, ethylbenzene, isopropylbenzene, and isopropyltoluene[4-] have surrogate ESLs for structurally related compounds (benzene and toluene, respectively) in the current version of the ECORISK Database. Perchlorate does not have interim or surrogate ESLs and is assessed qualitatively.

Ethylbenzene was detected in three samples with a maximum detected concentration of 0.00043 mg/kg. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the ethylbenzene EPC (0.00043 mg/kg) and results in a maximum HQ of 0.00002. Because this HQ is less than 0.3, ethylbenzene is eliminated as a COPEC.

Isopropylbenzene was detected in one sample with a maximum detected concentration of 0.00047 mg/kg. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the isopropylbenzene EPC (0.00047 mg/kg) and results in a maximum HQ of 0.0002. Because this HQ is less than 0.3, isopropylbenzene is eliminated as a COPEC.

Isopropyltoluene[4-] was detected in one sample with a maximum detected concentration of 0.0012 mg/kg. The minimum ESL for toluene (23 mg/kg for the shrew) is used to screen the isopropyltoluene[4-] EPC (0.0012 mg/kg) and results in a maximum HQ of 0.00005. Because this HQ is less than 0.3, isopropyltoluene[4-] is eliminated as a COPEC.

Perchlorate was detected in two samples with a maximum detected concentration of 0.00059 mg/kg. The NMED residential SSL for perchlorate is 54.8 mg/kg, indicating that potential toxicity is low. Because of the infrequent detection and the potentially low toxicity, perchlorate is eliminated as a COPEC.

Based these assessments, no COPECs remain at this SWMU, and no potential ecological risk to receptors exists.

AOC 39-007(d)

No ESLs are available in the current version of the ECORISK Database, Version 2.3 (LANL 2008, 103352) for perchlorate; bromomethane; diphenylamine; isopropyltoluene[4-]; trichlorofluoromethane; trimethylbenzene[1,2,4-]; and trimethylbenzene[1,3,5-]. However, diphenylamine has interim ESLs for at least one receptor based on toxicity information from the USDA Integrated Pesticide Management Database. In addition, isopropyltoluene[4-]; trimethylbenzene[1,2,4-]; and trimethylbenzene[1,3,5-] have surrogate ESLs for structurally related compounds (toluene and benzene, respectively) in the current version of the ECORISK Database. Nitrate, perchlorate, bromomethane, and trichlorofluoromethane do not have interim or surrogate ESLs and are assessed qualitatively.

The minimum interim ESL for diphenylamine [17 mg/kg for the robin (insectivore)] is used to screen the diphenylamine EPC (1.85 mg/kg) and results in a maximum HQ of 0.1. Because this HQ is less than 0.3, diphenylamine is eliminated as a COPEC.

Trimethylbenzene[1,2,4-] was detected in one sample with a maximum detected concentration of 0.203 mg/kg. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the trimethylbenzene[1,2,4-] EPC (0.203 mg/kg) and results in a maximum HQ of 0.008. Because this HQ is less than 0.3, trimethylbenzene[1,2,4-] is eliminated as a COPEC.

Trimethylbenzene[1,3,5-] was detected in two samples with a maximum detected concentration of 0.256 mg/kg. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the trimethylbenzene[1,3,5-] EPC (0.256 mg/kg) and results in a maximum HQ of 0.01. Because this HQ is less than 0.3, trimethylbenzene[1,3,5-] is eliminated as a COPEC.

Isopropyltoluene[4-] was detected in two samples with a maximum detected concentration of 0.142 mg/kg. The minimum ESL for toluene (23 mg/kg for the shrew) is used to screen the isopropyltoluene[4-] EPC (0.142 mg/kg) and results in a maximum HQ of 0.006. Because this HQ is less than 0.3, isopropyltoluene[4-] is eliminated as a COPEC.

Perchlorate was detected in one sample with a maximum detected concentration of 0.0048 mg/kg. The NMED residential SSL for perchlorate is 54.8 mg/kg, indicating that potential toxicity is low. Because of the infrequent detection and the potentially low toxicity, perchlorate is eliminated as a COPEC.

Bromomethane was detected in one sample with a maximum detected concentration of 0.00067 mg/kg. The NMED residential SSL for bromomethane is 22.3 mg/kg, indicating that potential toxicity is low. Because of the infrequent detection and the potentially low toxicity, bromomethane is eliminated as a COPEC.

Trichlorofluoromethane was detected in 10 samples with a maximum detected concentration of 0.0013 mg/kg. The NMED residential SSL for trichlorofluoromethane is 2010 mg/kg, indicating that potential toxicity is very low. Because of the infrequent detection and the potentially very low toxicity, trichlrorfluoromethane is eliminated as a COPEC.

Based these assessments, no COPECs remain at this SWMU, and no potential ecological risk to receptors exists.

SWMU 39-010

No ESLs are available in the current version of the ECORISK Database, Version 2.3 (LANL 2008, 103352) for iron, perchlorate, chloromethane, hexanone[2-], magnesium, and trimethylbenzene[1,3,5-]. Hexanone[2-] and trimethylbenzene[1,3,5-] have surrogate ESLs for structurally related compounds (butanone[2-] and benzene, respectively) in the current version of the ECORISK Database. Iron, nitrate, perchlorate, and chloromethane do not have interim or surrogate ESLs and are assessed qualitatively.

Hexanone[2-] was detected in one sample with a maximum detected concentration of 0.0038 mg/kg. The minimum ESL for butanone[2-] (360 mg/kg for the deer mouse) is used to screen the hexanone[2-] EPC (0.0038 mg/kg) and results in a maximum HQ of 0.00001. Because this HQ is less than 0.3, hexanone[2-] is eliminated as a COPEC.

Iron was detected in 53 samples, with only seven samples having concentrations above background for Qbo (concentrations in soil and sediment were background). The maximum detected concentration for iron is 11,300 mg/kg (in soil) and the EPC is 6420 mg/kg. All Qbo concentrations were less than 2 times the Qbo BV and maximum background concentration (3700 mg/kg). The EPC is less than the soil and sediment BVs and maximum background concentrations. Because iron is not substantially different from background and is infrequently detected above background, it is eliminated as a COPEC.

Magnesium was detected above background in two Qbo samples (929 mg/kg and 967 mg/kg) and has an EPC of 674 mg/kg. The EPC is similar to the BV (739 mg/kg) so exposure is similar to background across the site. Because magnesium is not substantially different from background and is infrequently detected above background, it is eliminated as a COPEC.

Perchlorate was detected in eight samples with a maximum detected concentration of 0.0049 mg/kg. The NMED residential SSL for perchlorate is 54.8 mg/kg, indicating that potential toxicity is low. Because of the infrequent detection and the potentially low toxicity, perchlorate is eliminated as a COPEC.

Chloromethane was detected in one sample with a maximum detected concentration of 0.00053 mg/kg. The NMED residential SSL for chloromethane is 35.6 mg/kg, indicating that potential toxicity is low. Because of the infrequent detection and the potentially low toxicity, chloromethane is eliminated as a COPEC.

Trimethylbenzene[1,3,5-] was detected in two samples with a maximum detected concentration of 0.0005 mg/kg. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the trimethylbenzene[1,3,5-] EPC (0.0005 mg/kg) and results in a maximum HQ of 0.00002. Because this HQ is less than 0.3, trimethylbenzene[1,3,5-] is eliminated as a COPEC.

Based these assessments, no COPECs remain at this SWMU, and no potential ecological risk to receptors exists.

Extended Drainages

No ESLs are available in the current version of the ECORISK Database, Version 2.3 (LANL 2008, 103352) for iron; perchlorate; bromomethane; chloromethane; dichlorobenzene[1,2-]; iodomethane; isopropyltoluene[4-]; styrene; TATB; and trimethylbenzene[1,2,4-]. However, dichlorobenzene[1,2-]; iodomethane; and styrene have interim ESLs for at least one receptor based on toxicity information from the EPA ECOTOX Database, USDA Integrated Pesticide Management Database, and Oak Ridge National Laboratory Risk Assessment Information System, respectively. In addition, isopropyltoluene[4-] and trimethylbenzene[1,2,4-] have surrogate ESLs for a structurallyrelated compound (toluene and

benzene, respectively) in the current version of the ECORISK Database. Iron, nitrate, perchlorate, bromomethane, chloromethane, and TATB do not have interim or surrogate ESLs and are assessed qualitatively.

The minimum interim ESL for iodomethane [0.1 mg/kg for the robin (herbivore)] is used to screen the iodomethane EPC (0.00054 mg/kg) and results in a maximum HQ of 0.0054. Because this HQ is less than 0.3, iodomethane is eliminated as a COPEC.

The minimum interim ESL for dichlorobenzene[1,2-] (0.92 mg/kg for the shrew) is used to screen the dichlorobenzene[1,2-] EPC (0.00065 mg/kg) and results in a maximum HQ of 0.0007. Because this HQ is less than 0.3, dichlorobenzene[1,2-] is eliminated as a COPEC.

The minimum interim ESL for styrene (1.2 mg/kg for the earthworm) is used to screen the styrene EPC (0.00037 mg/kg) and results in a maximum HQ of 0.0003. Because this HQ is less than 0.3, styrene is eliminated as a COPEC.

Isopropyltoluene[4-] was detected in one sample with a maximum detected concentration of 0.00059 mg/kg. The minimum ESL for toluene (23 mg/kg for the shrew) is used to screen the isopropyltoluene[4-] EPC (0.00059 mg/kg) and results in a maximum HQ of 0.00003. Because this HQ is less than 0.3, isopropyltoluene[4-] is eliminated as a COPEC.

Trimethylbenzene[1,2,4-] was detected in two samples with a maximum detected concentration of 0.00056 mg/kg. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the trimethylbenzene[1,2,4-] EPC (0.00056 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.

Iron was detected in 192 samples, with only two samples having concentrations above sediment background. Soil concentrations are below soil background. The maximum detected concentration for iron is 24,100 mg/kg and the EPC is 6836 mg/kg. The sediment concentrations were less than 2 times the sediment BV (13,800 mg/kg) and the maximum sediment background concentration (13,000 mg/kg). The EPC is less than the soil and sediment BVs. Because iron is not substantially different from background and is infrequently detected above background, it is eliminated as a COPEC.

Perchlorate was detected in 32 samples with a maximum detected concentration of 0.02 mg/kg. The NMED residential SSL for perchlorate is 54.8 mg/kg, indicating that potential toxicity is low. Because of the infrequent detection and the potentially low toxicity, perchlorate is eliminated as a COPEC.

Bromomethane was detected in one sample with a maximum detected concentration of 0.00045 mg/kg. The NMED residential SSL for bromomethane is 22.3 mg/kg, indicating that potential toxicity is low. Because of the infrequent detection and the potentially low toxicity, bromomethane is eliminated as a COPEC.

Chloromethane was detected in three samples with a maximum detected concentration of 0.00064 mg/kg. The NMED residential SSL for chloromethane is 35.6 mg/kg, indicating that potential toxicity is low. Because of the infrequent detection and the potentially low toxicity, chloromethane is eliminated as a COPEC.

TATB was detected in three samples with a maximum detected concentration of 11.6 mg/kg. There are no NMED or EPA residential SSLs for TATB. Because of the infrequent detection, TATB is eliminated as a COPEC.

Based these assessments, no COPECs remain at this SWMU and there is no potential ecological risk to receptors.

SWMU 39-006(a) Inactive Components

No ESLs are available in the current version of the ECORISK Database, Version 2.3 (LANL 2008, 103352) for nitrate, perchlorate, iodomethane, isopropyltoluene[4-], and trimethylbenzene[1,2,4-]. However, iodomethane has interim ESLs for at least one receptor based on toxicity information from the USDA Integrated Pesticide Management Database. In addition, isopropyltoluene[4-] and trimethylbenzene[1,2,4-] have surrogate ESLs for a structurally related compound (toluene and benzene, respectively) in the current version of the ECORISK Database. Nitrate and perchlorate do not have interim or surrogate ESLs, and are assessed qualitatively.

The minimum interim ESL for iodomethane (0.1 mg/kg for the robin [herbivore]) is used to screen the iodomethane EPC (0.0009 mg/kg) and results in a maximum HQ of 0.009. Because this HQ is less than 0.3, iodomethane is eliminated as a COPEC.

Isopropyltoluene[4-] was detected in one sample with a maximum detected concentration of 0.00059 mg/kg. The minimum ESL for toluene (23 mg/kg for the shrew) is used to screen the isopropyltoluene[4-] EPC (0.00059 mg/kg) and results in a maximum HQ of 0.00003. Because this HQ is less than 0.3, isopropyltoluene[4-] is eliminated as a COPEC.

Trimethylbenzene[1,2,4-] was detected in five samples with a maximum detected concentration of 0.00056 mg/kg. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the trimethylbenzene[1,2,4-] EPC (0.00056 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.

Nitrate was detected in seven samples with a maximum detected concentration of 65.7 mg/kg. Nitrate is naturally occurring and most of the detected concentrations likely reflect natural levels, but no background data are available. The NMED residential SSL for nitrate is 125,000 mg/kg, indicating that potential toxicity is very low. Because of the potentially very low toxicity and the naturally occurring concentrations, nitrate is eliminated as a COPEC.

Perchlorate was detected in three samples with a maximum detected concentration of 0.0032 mg/kg. The NMED residential SSL for perchlorate is 54.8 mg/kg, indicating that potential toxicity is low. Because of the infrequent detection and the potentially low toxicity, perchlorate is eliminated as a COPEC.

Based these assessments, no COPECs remain at this SWMU and there is no potential ecological risk to receptors.

H-5.5 Interpretation and Lines of Evidence

H-5.5.1 Receptor Lines of Evidence

Based on the ecological risk-screening assessments, several COPECs (including COPECs without an ESL) were identified at each of the sites within the North Ancho 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 T&E species), and comparisons to previous field and laboratory canyon investigations. The lines of evidence are presented by receptor in the following subsections.

American Kestrel (Intermediate Carnivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the American kestrel (intermediate carnivore), were less than 0.3.
- The HI analysis eliminated the kestrel (intermediate carnivore) at SWMU 39-002(f) because the HIs were less than or equivalent to 1.0.
- Several COPECs were eliminated because their EPCs were similar to background concentrations.
- The HIs were adjusted by comparisons to background and the PAUF. The adjusted HIs for the kestrel (intermediate carnivore) were less than 1.0 at all sites.

These lines of evidence support the conclusion that no potential ecological risk to the kestrel (intermediate carnivore) exists in the North Ancho Canyon Aggregate Area.

American Kestrel (Top Carnivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the Mexican spotted owl, were less than 0.3.
- The HI analysis eliminated the kestrel (top carnivore) at SWMUs 39-002(c) and 39-002(f) because the HIs were less than or equivalent to 1.0.
- Several COPECs were eliminated because their EPCs were similar to background concentrations.
- The HIs were adjusted by comparisons to background, the AUF because the Mexican spotted owl is a T&E species, and the PAUF for the kestrel (top carnivore). The adjusted HIs were less than 1.0 at all sites.

These lines of evidence support the conclusion that no potential ecological risks to the Mexican spotted owl and the kestrel (top carnivore) exist in the North Ancho Canyon Aggregate Area.

H-5.5.1.3 Robin (All Feeding Guilds)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the robin, were less than 0.3.
- The HI analysis eliminated the robin (all feeding guilds) at SWMU 39-002(f) and the robin (herbivore) at AOC 39-007(d) because the HIs were less than or equivalent to 1.0.
- Several COPECs were eliminated because their EPCs were similar to background concentrations.
- The HIs were adjusted by comparisons to background and the PAUF. The adjusted HIs were less than or equivalent to 1.0 at all sites, except at SWMU 39-010 and in the extended drainages.
- 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 HIs at SWMU 39-010 are less than 10, the HIs likely do not indicate potential risks.
- Field studies and laboratory analyses on birds in Los Alamos/Pueblo Canyon (LANL 2004, 087390) and Mortandad Canyon (LANL 2006, 094161; LANL 2007, 098279) included reaches

with similar concentrations for copper, mercury, bis(2-ethylhexyl)phthalate, and di-n-butyl phthalate, and found no effects from exposure.

These lines of evidence support the conclusion that no potential ecological risk to the robin (all feeding guilds) exists in the North Ancho Canyon Aggregate Area.

H-5.5.1.4 Deer Mouse (Omnivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the deer mouse, were less than 0.3.
- The HI analysis eliminated the deer mouse at SWMUs, 39-002(c), 39-005, 39-006(a) active and inactive components because the HIs were less than or equivalent to 1.0.
- Several COPECs were eliminated because their EPCs were similar to background concentrations.
- The HIs were adjusted by comparisons to background and the PAUF. The adjusted HIs were less than or equivalent to 1.0 at all sites, except SWMU 39-010.
- 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 adjusted HI (4) at SWMU 39-010 is less than 10, the HI probably does not indicate potential risk.
- Field studies and laboratory analyses on small mammals in Los Alamos/Pueblo Canyon (LANL 2004, 087390) and Mortandad Canyon (LANL 2006, 094161; LANL 2007, 098279) included reaches with similar concentrations of copper, mercury, bis(2-ethylhexyl)phthalate, and di-n-butyl phthalate, and found no effects from exposure.

These lines of evidence support the conclusion that no potential ecological risk to the deer mouse exists at the sites in the North Ancho 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, including the desert cottontail, were less than 0.3.
- The HI analysis eliminated the desert cottontail at SWMUs 39-002(a) Area 3, 39-002(c), 39-002(f), 39-005, 39-006(a) active and inactive components, 39-007(a), AOC 39-007(d), and the extended drainages because the HIs were less than or equivalent to 1.0.
- Several COPECs were eliminated because their EPCs were similar to background concentrations.
- The HIs were adjusted by comparisons to background and the PAUF. The adjusted HIs were less than or equivalent to 1.0 at all sites.

These lines of evidence support the conclusion that no potential ecological risk to the desert cottontail exists at the sites in the North Ancho Canyon Aggregate Area.

Earthworm (Invertebrate)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the earthworm, were less than 0.3.
- The HI analysis eliminated the earthworm at SWMUs 39-002(a) Area 3, 39-002(f), 39-006(a) inactive components, and 39-007(a) and AOC 39-007(d) because the HIs were less than or equivalent to 1.0.
- Several COPECs were eliminated because their EPCs were similar to background concentrations.
- The HIs were adjusted by comparisons to background.
- The mercury ESL (0.05 mg/kg) for the earthworm is less than background and overestimates potential risk. If the mercury BV of 0.1 mg/kg is used the HI is reduced by half. In addition, because the plant community does not appear affected by the COPECs, the earthworm population is probably also not affected.
- 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.
- Laboratory studies on earthworms and/or other invertebrates in Los Alamos/Pueblo Canyon (LANL 2004, 087390), Mortandad Canyon (LANL 2006, 094161; LANL 2007, 098279), and Pajarito Canyon (LANL 2008, 104909; LANL 2009, 106771) included reaches with similar mercury and copper concentrations and found no effects from exposure.

These lines of evidence support the conclusion that no potential ecological risk to the earthworm exists at the North Ancho Canyon Aggregate Area.

Plant

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the plant, were less than 0.3.
- The HI analysis eliminated the plant at SWMUs 39-002(a) Area 3, 39-002(c), and 39-006(a) active and inactive components, and AOC 39-007(d) because the HIs were less than or equivalent to 1.0.
- Several COPECs were eliminated because their EPCs were similar to background concentrations.
- The HIs were adjusted by comparisons to background. The adjusted HIs were less than or equivalent to 1.0 at SWMU 39-007(a) and the extended drainages.
- The plant communities were evaluated at all sites during site visits. No evidence of adverse impacts of contamination to the plant community based on field observations was found during site visits (Attachment H-2); the plant community is typical of the surrounding area and appears healthy. No marked differences in vegetation were observed between the sites with elevated plant HIs and the sites with similar topography that did not have elevated HIs.
- 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, the adjusted HIs for the plant at SWMUs 39-005 and 39-010 likely do not indicate potential risk.

- Field and laboratory studies on plants in Los Alamos/Pueblo Canyon (LANL 2004, 087390) and Mortandad Canyon (LANL 2006, 094161; LANL 2007, 098279), and Pajarito Canyon (LANL 2008, 104909; LANL 2009, 106771) included reaches with similar COPEC concentrations and found no effects from exposure.

These lines of evidence support the conclusion that no potential ecological risk to the plant exists at the North Ancho 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, including the shrew, were less than 0.3.
- The HI analysis eliminated the shrew at SWMU 39-006(a) active and inactive components because the HIs were less than or equivalent to 1.0.
- Several COPECs were eliminated because their EPCs were similar to background concentrations.
- The HIs were adjusted by comparisons to background and the PAUF. The adjusted HIs were less than 1.0 at all sites, except the extended drainages.
- 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 adjusted HI in the extended drainages is less than 3, the HI likely does not indicate potential risk.
- Field studies and laboratory analyses on small mammals in Los Alamos/Pueblo Canyon (LANL 2004, 087390) and Mortandad Canyon (LANL 2006, 094161; LANL 2007, 098279) included reaches with similar concentrations of copper, mercury, bis(2-ethylhexyl)phthalate, and di-n-butyl phthalate, and found no effects from exposure.

These lines of evidence support the conclusion that no potential ecological risk to the shrew exists in the North Ancho Canyon Aggregate Area.

Red Fox (Top Carnivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the red fox, were less than 0.3.
- The HI analysis eliminated the red fox at SWMUs 39-002(a) Area 3, 39-002(c), 39-002(f), 39-005, and 39-006(a) active and inactive components because the HIs were less than or equivalent to 1.0.
- Several COPECs were eliminated because their EPCs were similar to background concentrations.
- The HIs were adjusted by comparisons to background and the PAUF. The adjusted HIs were less than 1.0 at all sites.
- These lines of evidence support the conclusion that no potential ecological risk to the red fox exists in the North Ancho Canyon Aggregate Area.

H-5.5.2 Summary

No potential ecological risk was found for any receptor following evaluations based on minimum ESL, HI analyses, comparisons to background, potential effects to populations (individuals for T&E species), and the results of previous field studies in other canyons. These lines of evidence, discussed above for each receptor, and the analysis of COPECs with no ESLs support the conclusion that no potential ecological risk exists within the North Ancho Canyon Aggregate Area.

H-6.0 CONCLUSIONS

H-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 scenario, except at SWMUs 39-002(a) Area 1 and 39-007(a). The human health risk-screening assessments indicated no potential unacceptable risks or doses for the recreational scenario in the extended drainages (the only area evaluated under this scenario). The human health risk-screening assessments indicated no potential unacceptable risks or doses from COPCs for the residential scenario, except at SWMU 39-002(a) Area 1 and SWMU 39-007(a).

At SWMU 39-007(a), the total excess cancer risks for the industrial and residential scenarios are from Aroclor-1254 and Aroclor-1260 and the elevated HI for the residential scenario is primarily from Aroclor-1254. At SWMU 39-002(a) Area 1, the total excess cancer risks for the industrial scenario is due to benzo(a)pyrene and for the residential scenario is due to benzo(a)pyrene and dibenz(a,h)anthracene.

The total excess cancer risks were less than the NMED target level of 1×10^{-5} for the industrial and residential scenarios at SWMUs 39-001(b), 39-002(a) Area 3, 39-005, 39-006(a) inactive and active components, and 39-010, as well as AOCs 39-002(c), 39-002(f), and 39-007(d) and the extended drainages.

The HIs were below the NMED target HI of 1.0 for the industrial and residential scenarios at SWMUs 39-001(b), 39-002(a) Area 1, 39-002(a) Area 3, 39-005, 39-006(a) inactive and active components, and 39-010, as well as AOCs 39-002(c), 39-002(f), and 39-007(d) and the extended drainages. The HI for the industrial scenario was also below the NMED target HI of 1.0 at SWMU 39-007(a).

The total excess cancer risk and HI for the recreational scenario in the extended drainages were below NMED target levels.

Total doses for all scenarios were below the DOE target dose of 15 mrem/yr at all sites. The equivalent total risks were estimated using EPA's radionuclide PRGs for an outdoor worker and a resident (http://epa-orgs.ornl.gov/cgi-bin/radionuclides/rprg_search) and a conversion from RESRAD for the recreational scenario. The radionuclide total risks for the industrial scenario ranged from 5×10^{-11} to 1×10^{-7}, for the residential scenario ranged from 2×10^{-8} to 4×10^{-5}, and was 2×10^{-9} for the recreational scenario in the extended drainages.

The Laboratory's as low as reasonably achievable (ALARA) program description, presented in the "Los Alamos National Laboratory Environmental ALARA Program," PD410, p. 7, effective September 8, 2008, states that "…quantitative ALARA evaluations are not necessary for Laboratory activities that have a potential for annual public exposure less than a 3-mrem TEDE individual dose…." For SWMU 39-006(a), which is the only site where public access is possible, the calculated radiation dose

for the residential scenario is 0.9 mrem/yr. Therefore, radiation exposure to the public at this site is ALARA.

The majority of sites at TA-39 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.

H-6.2 Ecological Risk

No potential ecological risks were found for any receptor based on minimum ESL comparisons, HI analyses, comparisons to background concentrations, and potential effects to populations (individuals for T&E species). In addition, field and laboratory studies conducted and reported as part of the ecological investigations in Los Alamos and Pueblo Canyons (LANL 2004, 087390), Mortandad Canyon (LANL 2006, 094161; LANL 2007, 098279), and Pajarito Canyon (LANL 2008, 104909; LANL 2009, 106771) have found that similar concentrations of COPECs have not adversely impacted small mammal, bird, earthworm, and plant populations, and individual Mexican spotted owls. These lines of evidence, discussed above for each receptor, and the analysis of COPECs with no ESLs support the conclusion that no potential ecological risks exist at the North Ancho Canyon Aggregate Area.

H-7.0 REFERENCES

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Copies of the master reference set are maintained at the New Mexico Environment Department 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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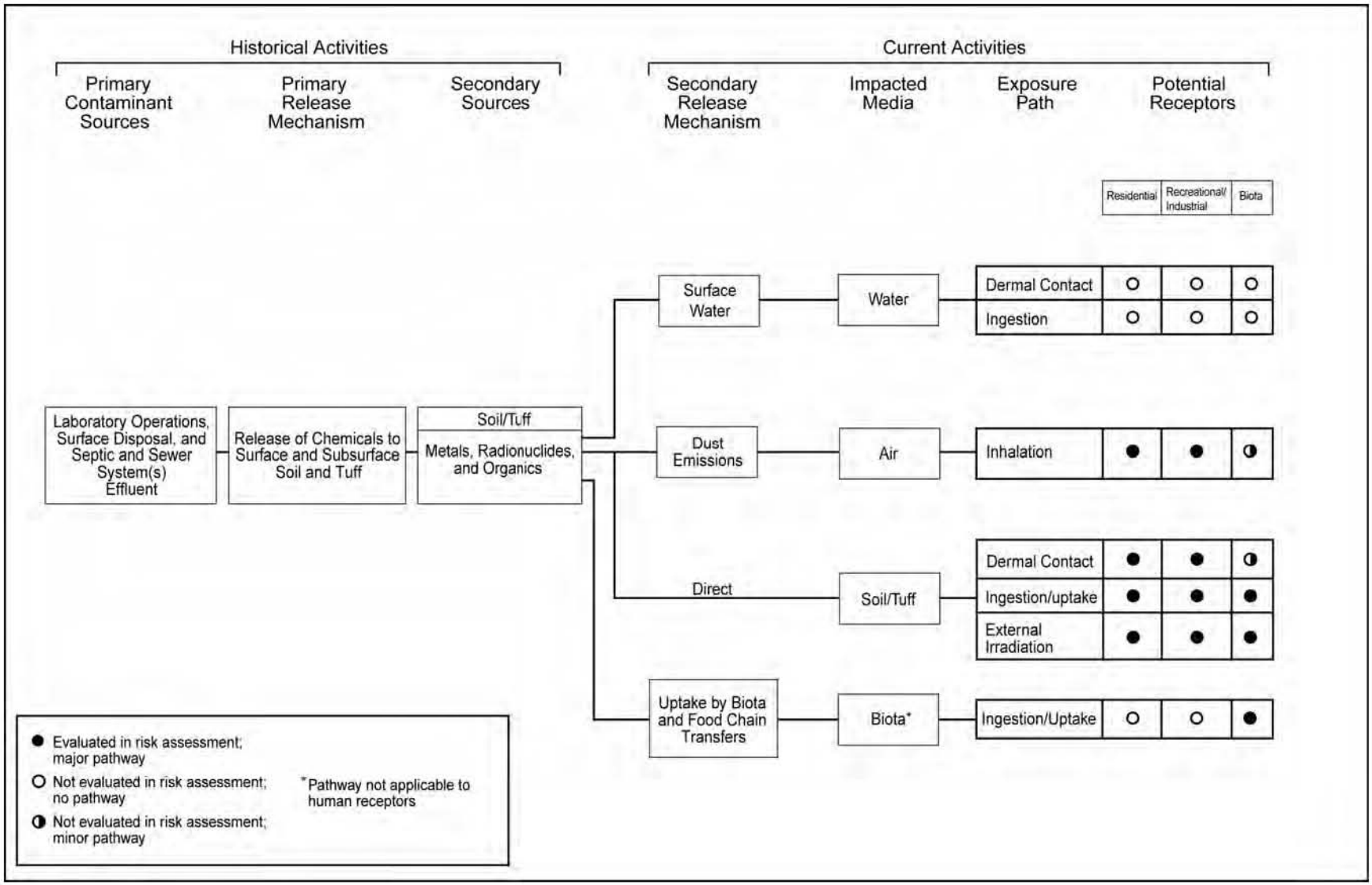


Figure H-3.0-1 Conceptual site model for the North Ancho Canyon Aggregate Area

Table H-2.3-1
Industrial COPC Statistics for SWMU 39-002(a) Area 1

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Cadmium	17/23	0.569	0.529	2.3	0.76	95% KM (Percentile Bootstrap) UCL
Copper	23/23	74.25	110.6	508	116.2	95% Approximate Gamma UCL
Lead	23/23	51.31	55.7	233	77.98	95% H-UCL
Mercury	22/23	0.49	0.689	2.5	1.408	97.5% KM (Chebyshev) UCL
Silver	16/23	0.394	0.301	1.1	0.51	95% KM (t) UCL
Zinc	23/23	101.4	90.72	416	132.2	95% Approximate Gamma UCL
Acenaphthene	16/23	0.429	0.467	1.8	0.596	95% KM (BCA) UCL
Anthracene	17/23	0.687	0.78	3.1	1.42	95% KM (Chebyshev) UCL
Aroclor-1254	20/23	0.16	0.117	0.449	0.203	95% KM (BCA) UCL
Benzo(a)anthracene	20/23	1.681	1.587	6.48	2.235	95% KM (BCA) UCL
Benzo(a)pyrene	22/23	1.993	1.75	6.75	3.621	95% KM (Chebyshev) UCL
Benzo(b)fluoranthene	22/23	1.946	1.83	8.36	3.648	95% KM (Chebyshev) UCL
Benzo(g,h,i)perylene	22/23	1.091	1.079	4.45	2.095	95% KM (Chebyshev) UCL
Benzo(k)fluoranthene	18/23	1.576	1.376	5.2	2.087	95% KM (Percentile Bootstrap) UCL
Bis(2-ethylhexyl)phthalate	7/23	0.211	0.217	0.908	0.311	95% KM (t) UCL
Chrysene	22/23	2.017	1.707	7.3	3.605	95% KM (Chebyshev) UCL
Di-n-butylphthalate	12/23	0.615	0.997	4.4	1.017	95% KM (BCA) UCL
Dibenzofuran	7/23	0.236	0.298	1.1	0.513	95% KM (Percentile Bootstrap) UCL
Fluoranthene	22/23	5.046	4.895	21	9.6	95% KM (Chebyshev) UCL
Fluorene	15/23	0.441	0.496	2	0.634	95% KM (BCA) UCL
Indeno(1,2,3-cd)pyrene	21/23	1.032	1.026	4.2	1.987	95% KM (Chebyshev) UCL
Methylnaphthalene[2-]	8/23	0.119	0.112	0.44	0.173	95% KM (t) UCL
Naphthalene	12/23	0.279	0.377	1.5	0.422	95% KM (BCA) UCL
Phenanthrene	22/23	3.856	4.225	18	7.787	95% KM (Chebyshev) UCL

Table H-2.3-1 (continued)

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Pyrene	22/23	4.249	4.075	17	8.04	95% KM (Chebyshev) UCL
TPH-DRO	11/11	69.09	44.14	170	93.21	95% Student's-t UCL
Uranium-238	23/23	1.928	1.83	8.21	3.591	95% Chebyshev (Mean, Sd) UCL
Antimony	1/23	na*	na	2.46	2.46	Maximum Detected Value
Cyanide (total)	2/12	na	na	20.8	20.8	Maximum Detected Value
Thallium	2/23	na	na	1.26	1.26	Maximum Detected Value
Acenaphthylene	4/23	na	na	0.201	0.201	Maximum Detected Value
Amino-2,6-dinitrotoluene[4-]	1/23	na	na	0.171	0.171	Maximum Detected Value
Aroclor-1260	5/23	na	na	0.155	0.155	Maximum Detected Value
Dibenz(a,h)anthracene	4/23	na	na	0.5	0.5	Maximum Detected Value
Ethylbenzene	1/23	na	na	0.000718	0.000718	Maximum Detected Value
Methylene chloride	3/23	na	na	0.00287	0.00287	Maximum Detected Value
Tetryl	1/23	na	na	0.345	0.345	Maximum Detected Value
Toluene	3/23	na	na	0.0233	0.0233	Maximum Detected Value
Trichloroethene	2/23	na	na	0.000747	0.000747	Maximum Detected Value
Trimethylbenzene[1,2,4-]	1/23	na	na	0.00047	0.00047	Maximum Detected Value
Trinitrotoluene[2,4,6-]	1/23	na	na	1.02	1.02	Maximum Detected Value
Tritium	1/12	na	na	0.11291	0.11291	Maximum Detected Value
Xylene[1,2-]	2/5	na	na	0.000624	0.000624	Maximum Detected Value
Xylene[1,3-]+Xylene[1,4-]	2/5	na	na	0.00177	0.00177	Maximum Detected Value
TCDD[2,3,7,8-] equivalent	1/1	na	na	0.000000348	0.000000348	Maximum Detected Value

*na = Not available.

Table H-2.3-2
Residential and Ecological COPC Statistics for SWMU 39-002(a) Area 1

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Cadmium	37/52	0.354	0.432	2.3	0.625	95% KM (Chebyshev) UCL
Copper	52/52	38.99	79.93	508	62.22	Use 95% H-UCL
Lead	52/52	48.47	137.8	977	52.62	Use 95% H-UCL
Mercury	40/52	0.314	0.542	2.5	0.646	95% KM (Chebyshev) UCL
Silver	40/52	0.261	0.258	1.1	0.327	95% KM (BCA) UCL
Zinc	52/52	75.93	89.24	467	88.09	Use 95% H-UCL
Acenaphthene	29/52	0.262	0.353	1.8	0.347	95% KM (BCA) UCL
Anthracene	34/52	0.404	0.594	3.1	0.557	95% KM (BCA) UCL
Aroclor-1254	35/52	0.0928	0.105	0.449	0.116	95% KM (BCA) UCL
Benzo(a)anthracene	37/52	0.936	1.283	6.48	1.725	95% KM (Chebyshev) UCL
Benzo(a)pyrene	41/52	1.094	1.452	6.75	1.983	95% KM (Chebyshev) UCL
Benzo(b)fluoranthene	41/52	1.081	1.485	8.36	1.99	95% KM (Chebyshev) UCL
Benzo(g,h,i)perylene	41/52	0.631	0.86	4.45	1.158	95% KM (Chebyshev) UCL
Benzo(k)fluoranthene	31/52	0.782	1.177	5.2	1.117	95% KM (BCA) UCL
Bis(2-ethylhexyl)phthalate	14/52	0.167	0.164	0.908	0.216	95% KM (t) UCL
Chrysene	41/52	1.124	1.434	7.3	2.002	95% KM (Chebyshev) UCL
Di-n-butylphthalate	20/52	0.375	0.704	4.4	0.564	95% KM (BCA) UCL
Fluoranthene	43/52	2.738	3.962	21	5.162	95% KM (Chebyshev) UCL
Fluorene	28/52	0.267	0.374	2	0.376	95% KM (BCA) UCL
Indeno(1,2,3-cd)pyrene	39/52	0.594	1.093	4.2	1.093	95% KM (Chebyshev) UCL
Methylnaphthalene[2-]	15/52	0.0787	0.0846	0.44	0.104	95% KM (t) UCL
Naphthalene	22/52	0.178	0.276	1.5	0.247	95% KM (t) UCL
Phenanthrene	43/52	2.116	3.3	18	4.134	95% KM (Chebyshev) UCL
Pyrene	43/52	2.319	3.307	17	4.342	95% KM (Chebyshev) UCL

Table H-2.3-2 (continued)

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
TPH-DRO	13/14	56.29	44.65	170	78.28	95% KM (t) UCL
Uranium-238	52/52	1.605	1.288	8.21	2.384	Use 95% Chebyshev (Mean, Sd) UCL
Antimony	1/52	na*	na	2.46	2.46	Maximum Detected Value
Cyanide (total)	5/38	na	na	20.8	20.8	Maximum Detected Value
Perchlorate	1/38	na	na	0.000715	0.000715	Maximum Detected Value
Thallium	2/52	na	na	1.26	1.26	Maximum Detected Value
Acenaphthylene	7/52	na	na	0.201	0.201	Maximum Detected Value
Amino-2,6-dinitrotoluene[4-]	1/52	na	na	0.171	0.171	Maximum Detected Value
Aroclor-1260	11/52	na	na	0.155	0.155	Maximum Detected Value
Dibenz(a,h)anthracene	9/52	na	na	0.5	0.5	Maximum Detected Value
Dibenzofuran	12/52	na	na	1.1	1.1	Maximum Detected Value
Dichlorobenzene[1,2-]	3/104	na	na	0.0007	0.0007	Maximum Detected Value
Ethylbenzene	1/52	na	na	0.000718	0.000718	Maximum Detected Value
Iodomethane	1/52	na	na	0.00081	0.00081	Maximum Detected Value
Methylene chloride	10/52	na	na	0.00345	0.00345	Maximum Detected Value
Tetryl	1/52	na	na	0.345	0.345	Maximum Detected Value
Toluene	3/52	na	na	0.0233	0.0233	Maximum Detected Value
Trichloroethene	3/52	na	na	0.00084	0.00084	Maximum Detected Value
Trimethylbenzene[1,2,4-]	1/52	na	na	0.00047	0.00047	Maximum Detected Value
Trinitrotoluene[2,4,6-]	1/52	na	na	1.02	1.02	Maximum Detected Value
Xylene[1,2-]	2/14	na	na	0.000624	0.000624	Maximum Detected Value
Xylene[1,3-]+Xylene[1,4-]	2/14	na	na	0.00177	0.00177	Maximum Detected Value
Plutonium-239/240	1/38	na	na	0.105	0.105	Maximum Detected Value
Tritium	1/38	na	na	8.21	8.21	Maximum Detected Value
TCDD[2,3,7,8-] equivalent	1/1	na	na	0.000000348	0.000000348	Maximum Detected Value

*na = Not available.

Table H-2.3-3
Industrial COPC Statistics for SWMU 39-002(a) Area 3

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Copper	9/9	17.28	23	78	37.83	Use 95% H-UCL
Cyanide (total)	5/9	0.176	0.0206	0.21	0.195	95% KM (t) UCL
Aroclor-1254	4/9	na*	na	0.013	0.013	Maximum Detected Value
Benzo(a)anthracene	6/9	0.0935	0.0441	0.17	0.13	95% KM (t) UCL
Benzo(a)pyrene	6/9	0.105	0.0436	0.18	0.141	95% KM (t) UCL
Benzo(b)fluoranthene	6/9	0.0893	0.0336	0.15	0.117	95% KM (t) UCL
Benzo(g,h,i)perylene	6/9	0.063	0.0191	0.091	0.0788	95% KM (t) UCL
Benzo(k)fluoranthene	6/9	0.103	0.0428	0.18	0.139	95% KM (t) UCL
Bis(2-ethylhexyl)phthalate	6/9	0.236	0.196	0.61	0.37	95% KM (t) UCL
Chrysene	7/9	0.107	0.0546	0.19	0.149	95% KM (t) UCL
Fluoranthene	9/9	0.172	0.134	0.39	0.255	Use 95% Student's-t UCL
Methylene chloride	4/9	na	na	0.002	0.002	Maximum Detected Value
Phenanthrene	6/9	0.14	0.0706	0.24	0.199	95% KM (t) UCL
Pyrene	9/9	0.16	0.122	0.38	0.236	Use 95% Student's-t UCL
Anthracene	2/9	na	na	0.053	0.053	Maximum Detected Value
Aroclor-1260	1/9	na	na	0.0091	0.0091	Maximum Detected Value
Di-n-butylphthalate	2/9	na	na	0.54	0.54	Maximum Detected Value
Indeno(1,2,3-cd)pyrene	2/9	na	na	0.079	0.079	Maximum Detected Value
Trichlorofluoromethane	1/9	na	na	0.00037	0.00037	Maximum Detected Value
TCDD[2,3,7,8-] equivalent	1/1	na	na	0.00000113	0.00000113	Maximum Detected Value

*na = Not available.

Table H-2.3-4
Residential and Ecological COPC Statistics for SWMU 39-002(a) Area 3

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Copper	16/16	11.79	18.02	78	31.44	Use 95% Chebyshev (Mean, Sd) UCL
Cyanide (total)	12/16	0.178	0.027	0.21	0.193	95% KM (t) UCL
Aroclor-1254	4/16	na*	na	0.013	0.013	Maximum Detected Value
Acetone	1/16	na	na	0.013	0.013	Maximum Detected Value
Anthracene	2/16	na	na	0.053	0.053	Maximum Detected Value
Aroclor-1260	1/16	na	na	0.0091	0.0091	Maximum Detected Value
Benzo(a)anthracene	6/16	0.0935	0.0441	0.17	0.128	95% KM (t) UCL
Benzo(a)pyrene	7/16	0.0963	0.0458	0.18	0.129	95% KM (t) UCL
Benzo(b)fluoranthene	6/16	0.0893	0.0336	0.15	0.116	95% KM (t) UCL
Benzo(g,h,i)perylene	6/16	0.063	0.0191	0.091	0.0779	95% KM (t) UCL
Benzo(k)fluoranthene	6/16	0.103	0.0428	0.18	0.137	95% KM (t) UCL
Bis(2-ethylhexyl)phthalate	7/16	0.189	0.158	0.61	0.267	95% KM (t) UCL
Chrysene	8/16	0.0996	0.0551	0.19	0.136	95% KM (t) UCL
Di-n-butylphthalate	2/16	na	na	0.54	0.54	Maximum Detected Value
Fluoranthene	12/16	0.133	0.11	0.39	0.185	95% KM (Percentile Bootstrap) UCL
Indeno(1,2,3-cd)pyrene	2/16	na	na	0.079	0.079	Maximum Detected Value
Iodomethane	1/16	na	na	0.00077	0.00077	Maximum Detected Value
Methylene chloride	7/16	0.00182	0.00051	0.0032	0.00214	95% KM (Percentile Bootstrap) UCL
PETN	1/16	na	na	0.00000344	0.00000344	Maximum Detected Value
Phenanthrene	8/16	0.116	0.0745	0.24	0.165	95% KM (t) UCL
Pyrene	12/16	0.129	0.106	0.38	0.183	95% KM (Percentile Bootstrap) UCL
Trichlorofluoromethane	1/16	na	na	0.00037	0.00037	Maximum Detected Value
TCDD[2,3,7,8-] equivalent	1/1	na	na	0.00000113	0.00000113	Maximum Detected Value

*na = Not available.

Table H-2.3-5
Industrial COPC Statistics for AOC 39-002(c)

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Copper	5/5	na*	na	20.6	20.6	Maximum Detected Value
Cyanide (total)	2/5	na	na	0.899	0.899	Maximum Detected Value
Zinc	5/5	na	na	112	112	Maximum Detected Value
Toluene	4/5	na	na	0.00145	0.00145	Maximum Detected Value
Cadmium	2/5	na	na	0.966	0.966	Maximum Detected Value
TCDD[2,3,7,8-] equivalent	1/1	na	na	0.000000399	0.000000399	Maximum Detected Value
Mercury	1/5	na	na	0.0158	0.0158	Maximum Detected Value
Aroclor-1254	1/5	na	na	0.0158	0.0158	Maximum Detected Value
Benzo(a)anthracene	1/5	na	na	0.0474	0.0474	Maximum Detected Value
Xylene[1,3-]+Xylene[1,4-]	1/5	na	na	0.000608	0.000608	Maximum Detected Value

*na = Not available.

Table H-2.3-6
Residential and Ecological COPC Statistics for AOC 39-002(c)

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Cadmium	2/10	na*	na	0.966	0.966	Maximum Detected Value
Copper	10/10	5.823	5.617	20.6	13.57	Use 95% Chebyshev (Mean, Sd) UCL
Cyanide (total)	3/10	0.238	0.234	0.899	0.423	95% KM (t) UCL
Mercury	1/10	na	na	0.0158	0.0158	Maximum Detected Value
Zinc	10/10	48.73	23.35	112	63.31	95% Modified-t UCL
Toluene	6/10	0.00074	0.00036	0.00145	0.00101	95% KM (t) UCL
Aroclor-1254	2/10	na	na	0.0158	0.0158	Maximum Detected Value
Benzo(a)anthracene	1/10	na	na	0.0474	0.0474	Maximum Detected Value
TCDD[2,3,7,8-] equivalent	1/1	na	na	0.0000004	0.0000004	Maximum Detected Value
Xylene[1,3-]+Xylene[1,4-]	1/10	na	na	0.000608	0.000608	Maximum Detected Value

*na = Not available.

Table H-2.3-7
Industrial COPC Statistics for AOC 39-002(f)

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Perchlorate	5/5	na*	na	0.00642	0.00642	Maximum Detected Value
Antimony	1/5	na	na	1.11	1.11	Maximum Detected Value
Copper	5/5	na	na	16.6	16.6	Maximum Detected Value
TCDD[2,3,7,8-] equivalent	1/1	na	na	0.0000000148	0.0000000148	Maximum Detected Value
Toluene	1/5	na	na	0.000627	0.000627	Maximum Detected Value

*na = Not available.

Table H-2.3-8
Residential and Ecological COPC Statistics for AOC 39-002(f)

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Antimony	1/10	na*	na	1.11	1.11	Maximum Detected Value
Copper	10/10	6.486	4.517	16.6	9.507	95% Approximate Gamma UCL
Perchlorate	10/10	0.00465	0.00167	0.00765	0.00562	95% Student's-t UCL
Benzo(a)pyrene	1/10	na	na	0.029	0.029	Maximum Detected Value
Benzo(b)fluoranthene	1/10	na	na	0.0462	0.0462	Maximum Detected Value
Benzo(g,h,i)perylene	1/10	na	na	0.0175	0.0175	Maximum Detected Value
Chrysene	1/10	na	na	0.0287	0.0287	Maximum Detected Value
Fluoranthene	1/10	na	na	0.058	0.058	Maximum Detected Value
Indeno(1,2,3-cd)pyrene	1/10	na	na	0.0159	0.0159	Maximum Detected Value
Phenanthrene	1/10	na	na	0.0397	0.0397	Maximum Detected Value
Pyrene	1/10	na	na	0.0595	0.0595	Maximum Detected Value
Toluene	2/10	na	na	0.000627	0.000627	Maximum Detected Value
TCDD[2,3,7,8-] equivalent	1/1	na	na	0.0000000148	0.0000000148	Maximum Detected Value

*na = Not available.

Table H-2.3-9
Industrial COPC Statistics for SWMU 39-005

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Acenaphthene	4/8	na*	na	0.24	0.24	Maximum Detected Value
Anthracene	4/8	na	na	0.34	0.34	Maximum Detected Value
Benzo(a)anthracene	7/8	na	na	1.1	1.1	Maximum Detected Value
Benzo(a)pyrene	7/8	na	na	0.99	0.99	Maximum Detected Value
Benzo(b)fluoranthene	7/8	na	na	0.81	0.81	Maximum Detected Value
Benzo(g,h,i)perylene	6/8	na	na	0.56	0.56	Maximum Detected Value
Benzo(k)fluoranthene	8/8	na	na	1.1	1.1	Maximum Detected Value
Chrysene	8/8	na	na	1.3	1.3	Maximum Detected Value
Dibenzofuran	3/8	na	na	0.16	0.16	Maximum Detected Value
Fluoranthene	8/8	na	na	2.6	2.6	Maximum Detected Value
Fluorene	4/8	na	na	0.24	0.24	Maximum Detected Value
Indeno(1,2,3-cd)pyrene	8/8	na	na	0.52	0.52	Maximum Detected Value
Methylene chloride	4/8	na	na	0.013	0.013	Maximum Detected Value
Naphthalene	3/8	na	na	0.28	0.28	Maximum Detected Value
Phenanthrene	7/8	na	na	2.2	2.2	Maximum Detected Value
Pyrene	8/8	na	na	3.1	3.1	Maximum Detected Value
Uranium-234	8/8	na	na	2.29	2.29	Maximum Detected Value
Uranium-235/236	7/8	na	na	0.234	0.234	Maximum Detected Value
Uranium-238	8/8	1.884	0.577	3.24	2.27	95% Student's t UCL
Mercury	3/8	na	na	0.72	0.72	Maximum Detected Value
Acetone	1/8	na	na	0.012	0.012	Maximum Detected Value
Bromomethane	1/8	na	na	0.00058	0.00058	Maximum Detected Value
Isopropyltoluene[4-]	1/8	na	na	0.028	0.028	Maximum Detected Value
Methylnaphthalene[2-]	1/8	na	na	0.068	0.068	Maximum Detected Value
Plutonium-238	2/8	na	na	0.038	0.038	Maximum Detected Value
Tritium	1/8	na	na	0.65	0.65	Maximum Detected Value
TCDD[2,3,7,8-] equivalent	1/1	na	na	0.000000181	0.000000181	Maximum Detected Value

*na = Not available.

Table H-2.3-10
Residential COPC Statistics for SWMU 39-005

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Benzo(a)anthracene	25/46	0.188	0.206	1.1	0.244	95% KM (t) UCL
Benzo(a)pyrene	25/46	0.187	0.199	0.99	0.241	95% KM (t) UCL
Benzo(b)fluoranthene	24/46	0.18	0.17	0.81	0.228	95% KM (t) UCL
Benzo(g,h,i)perylene	20/46	0.144	0.11	0.56	0.181	95% KM (t) UCL
Benzo(k)fluoranthene	26/46	0.196	0.217	1.1	0.254	95% KM (t) UCL
Chrysene	26/46	0.217	0.249	1.3	0.282	95% KM (t) UCL
Fluoranthene	32/46	0.363	0.522	2.6	0.506	95% KM (BCA) UCL
Indeno(1,2,3-cd)pyrene	16/46	0.151	0.101	0.52	0.191	95% KM (t) UCL
Methylene chloride	15/46	0.00485	0.0031	0.014	0.0057	95% KM (t) UCL
Phenanthrene	25/46	0.299	0.407	2.2	0.414	95% KM (BCA) UCL
Pyrene	32/46	0.349	0.54	3.1	0.704	95% KM (Chebyshev) UCL
Uranium-234	46/46	1.772	0.517	3.12	1.902	95% Modified-t UCL
Uranium-235/236	30/46	0.108	0.0482	0.282	0.123	95% KM (Percentile Bootstrap) UCL
Uranium-238	39/39	na*	na	3.24	3.24	Maximum Detected Value
Chromium	46/46	4.063	1.86	9.9	4.531	Use 95% Approximate Gamma UCL
Copper	46/46	3.826	4.668	32.4	6.826	Use 95% Chebyshev (Mean, Sd) UCL
Mercury	11/46	na	na	0.72	0.72	Maximum Detected Value
Nickel	46/46	2.728	1.057	5	3.012	Use 95% Approximate Gamma UCL
Dinitroaniline[3,5-]	2/39	na	na	0.0071	0.0071	Maximum Detected Value
Acenaphthene	8/46	na	na	0.24	0.24	Maximum Detected Value
Acetone	8/46	na	na	0.028	0.028	Maximum Detected Value
Amino-2,6-dinitrotoluene[4-]	2/39	na	na	0.014	0.014	Maximum Detected Value
Amino-4,6-dinitrotoluene[2-]	2/39	na	na	0.018	0.018	Maximum Detected Value
Anthracene	13/46	na	na	0.34	0.34	Maximum Detected Value
Aroclor-1254	1/46	na	na	0.34	0.34	Maximum Detected Value

Table H-2.3-10 (continued)

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Bromomethane	4/39	na	na	0.00058	0.00058	Maximum Detected Value
Dibenzofuran	7/46	na	na	0.16	0.16	Maximum Detected Value
Fluorene	9/46	na	na	0.24	0.24	Maximum Detected Value
Hexanone[2-]	1/39	na	na	0.026	0.026	Maximum Detected Value
Isopropyltoluene[4-]	2/39	na	na	0.028	0.028	Maximum Detected Value
Methylnaphthalene[2-]	1/39	na	na	0.068	0.068	Maximum Detected Value
Naphthalene	8/46	na	na	0.28	0.28	Maximum Detected Value
RDX	2/39	na	na	0.0094	0.0094	Maximum Detected Value
Trinitrobenzene[1,3,5-]	1/39	na	na	0.01	0.01	Maximum Detected Value
Trinitrotoluene[2,4,6-]	2/39	na	na	0.01	0.01	Maximum Detected Value
Plutonium-238	7/46	na	na	0.042	0.042	Maximum Detected Value
Tritium	2/46	na	na	0.65	0.65	Maximum Detected Value
TCDD[2,3,7,8-] equivalent	1/1	na	na	0.000000181	0.000000181	Maximum Detected Value

*na = Not available.

Table H-2.3-11
Ecological COPC Statistics for SWMU 39-005

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Acenaphthene	5/39	na*	na	0.24	0.24	Maximum Detected Value
Acetone	6/39	na	na	0.028	0.028	Maximum Detected Value
Amino-2,6-dinitrotoluene[4-]	2/39	na	na	0.014	0.014	Maximum Detected Value
Amino-4,6-dinitrotoluene[2-]	2/39	na	na	0.018	0.018	Maximum Detected Value
Anthracene	7/39	na	na	0.34	0.34	Maximum Detected Value
Benzo(a)anthracene	25/46	0.188	0.206	1.1	0.244	95% KM (t) UCL
Benzo(a)pyrene	25/46	0.187	0.199	0.99	0.241	95% KM (t) UCL
Benzo(b)fluoranthene	24/46	0.18	0.17	0.81	0.228	95% KM (t) UCL
Benzo(g,h,i)perylene	20/46	0.144	0.11	0.56	0.181	95% KM (t) UCL
Benzo(k)fluoranthene	26/46	0.196	0.217	1.1	0.254	95% KM (t) UCL
Bromomethane	4/39	na	na	0.00058	0.00058	Maximum Detected Value
Chromium	46/46	4.063	1.86	9.9	4.531	95% Approximate Gamma UCL
Copper	46/46	3.826	4.668	32.4	6.826	95% Chebyshev (Mean, Sd) UCL
Chrysene	26/46	0.217	0.249	1.3	0.282	95% KM (t) UCL
Cyanide	0/39	na	na	0.5	0.5	Maximum Detected Value
Dinitroaniline[3,5-]	2/39	na	na	0.0071	0.0071	Maximum Detected Value
Dibenzofuran	4/39	na	na	0.16	0.16	Maximum Detected Value
Fluoranthene	32/46	0.363	0.522	2.6	0.495	95% KM (BCA) UCL
Fluorene	5/39	na	na	0.24	0.24	Maximum Detected Value
Hexanone[2-]	1/39	na	na	0.026	0.026	Maximum Detected Value
Indeno(1,2,3-cd)pyrene	16/46	0.151	0.101	0.52	0.191	95% KM (t) UCL
Isopropyltoluene[4-]	2/39	na	na	0.028	0.028	Maximum Detected Value
Methylene chloride	15/46	0.00485	0.0031	0.014	0.0057	95% KM (t) UCL

Table H-2.3-11 (continued)

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Methylnaphthalene[2-]	1/39	na	na	0.068	0.068	Maximum Detected Value
Mercury	3/39	na	na	0.72	0.72	Maximum Detected Value
Naphthalene	5/39	na	na	0.28	0.28	Maximum Detected Value
Nickel	46/46	2.728	1.057	5	3.012	95% Approximate Gamma UCL
Phenanthrene	25/46	0.299	0.407	2.2	0.411	95% KM (BCA) UCL
Plutonium-238	6/39	na	na	0.042	0.042	Maximum Detected Value
Pyrene	32/46	0.349	0.54	3.1	0.704	95% KM (Chebyshev) UCL
RDX	2/39	na	na	0.0094	0.0094	Maximum Detected Value
Trinitrobenzene[1,3,5-]	1/39	na	na	0.01	0.01	Maximum Detected Value
Trinitrotoluene[2,4,6-]	2/39	na	na	0.01	0.01	Maximum Detected Value
Tritium	2/39	na	na	0.65	0.65	Maximum Detected Value
Uranium-234	46/46	1.772	0.517	3.12	1.902	95% Modified-t UCL
Uranium-235/236	30/46	0.108	0.0482	0.282	0.123	95% KM (Percentile Bootstrap) UCL
Uranium-238	46/46	1.81	0.537	3.24	1.94	95% Student's-t UCL
TCDD[2,3,7,8-] equivalent	1/1	na	na	0.000000181	0.000000181	Maximum Detected Value

*na = Not available.

Table H-2.3-12
Industrial COPC Statistics for SWMU 39-006(a) Active Components

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Mercury	3/3	na*	na	0.669	0.669	Maximum Detected Value
Bis(2-ethylhexyl)phthalate	2/3	na	na	0.11	0.11	Maximum Detected Value
TCDD[2,3,7,8-] equivalent	1/1	na	na	0.000000111	0.000000111	Maximum Detected Value

*na = Not available.

Table H-2.3-13
Residential and Ecological COPC Statistics for SWMU 39-006(a) Active Components

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Mercury	4/6	na*	na	0.669	0.669	Maximum Detected Value
Bis(2-ethylhexyl)phthalate	5/6	na	na	0.11	0.11	Maximum Detected Value
Amino-2,6-dinitrotoluene[4-]	1/6	na	na	0.0059	0.0059	Maximum Detected Value
2,3,7,8-TCDD Equivalent	1/1	na	na	0.000000111	0.000000111	Maximum Detected Value

*na = Not available.

Table H-2.3-14
Industrial COPC Statistics for SWMU 39-007(a)

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Cyanide (total)	2/9	na*	na	0.15	0.15	Maximum Detected Value
Cadmium	1/13	na	na	0.591	0.591	Maximum Detected Value
Aroclor-1248	1/13	na	na	0.35	0.35	Maximum Detected Value
Benzo(k)fluoranthene	1/9	na	na	0.042	0.042	Maximum Detected Value
Butybenzylphthalate	1/9	na	na	0.077	0.077	Maximum Detected Value
Chrysene	1/9	na	na	0.04	0.04	Maximum Detected Value
Dichlorobenzene[1,4-]	2/9	na	na	0.00074	0.00074	Maximum Detected Value
Ethylbenzene	2/9	na	na	0.00043	0.00043	Maximum Detected Value
Fluoranthene	1/9	na	na	0.076	0.076	Maximum Detected Value
Phenanthrene	1/9	na	na	0.067	0.067	Maximum Detected Value
Pyrene	1/9	na	na	0.08	0.08	Maximum Detected Value
Toluene	2/9	na	na	0.00095	0.00095	Maximum Detected Value
Antimony	5/13	0.37	0.159	0.749	0.529	95% KM (Percentile Bootstrap) UCL
Aroclor-1254	5/13	1.946	6.54	24.6	22.12	99% KM (Chebyshev) UCL
Aroclor-1260	8/13	0.63	2.076	7.82	6.754	99% KM (Chebyshev) UCL
Bis(2-ethylhexyl)phthalate	4/9	0.192	0.0668	0.268	0.264	95% KM (t) UCL

*na = Not available.

Table H-2.3-15
Residential and Ecological COPC Statistics for SWMU 39-007(a)

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Cadmium	7/28	0.146	0.14	0.591	0.223	95% KM (t) UCL
Aroclor-1254	14/28	1.072	4.566	24.6	2.598	95% KM (t) UCL
Aroclor-1260	16/28	0.312	1.447	7.82	3.122	99% KM (Chebyshev) UCL
Bis(2-ethylhexyl)phthalate	12/24	0.167	0.0507	0.268	0.193	95% KM (t) UCL
Perchlorate	2/24	na*	na	0.000585	0.000585	Maximum Detected Value
Cyanide (total)	4/24	na	na	0.16	0.16	Maximum Detected Value
Antimony	5/28	na	na	0.749	0.749	Maximum Detected Value
Acetone	2/24	na	na	0.0346	0.0346	Maximum Detected Value
Aroclor-1242	1/28	na	na	0.24	0.24	Maximum Detected Value
Aroclor-1248	3/28	na	na	0.35	0.35	Maximum Detected Value
Benzo(k)fluoranthene	1/24	na	na	0.042	0.042	Maximum Detected Value
Butylbenzylphthalate	1/24	na	na	0.077	0.077	Maximum Detected Value
Chrysene	1/24	na	na	0.04	0.04	Maximum Detected Value
Dichlorobenzene[1,4-]	2/24	na	na	0.00074	0.00074	Maximum Detected Value
Ethylbenzene	3/24	na	na	0.00043	0.00043	Maximum Detected Value
Fluoranthene	1/24	na	na	0.076	0.076	Maximum Detected Value
Isopropylbenzene	1/24	na	na	0.000467	0.000467	Maximum Detected Value
Isopropyltoluene[4-]	1/24	na	na	0.00117	0.00117	Maximum Detected Value
Phenanthrene	1/24	na	na	0.067	0.067	Maximum Detected Value
Pyrene	1/24	na	na	0.08	0.08	Maximum Detected Value
Toluene	3/24	na	na	0.00095	0.00095	Maximum Detected Value

*na = Not available.

Table H-2.3-16
Industrial COPC Statistics for AOC 39-007(d)

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Zinc	19/19	34.81	11.55	70.8	39.59	95% Modified-t UCL
Methylene chloride	9/19	0.00276	0.00113	0.00485	0.00342	95% KM (t) UCL
TCDD[2,3,7,8-] equivalent	18/18	0.0000000555	0.0000000829	0.000000257	0.000000103	95% Approximate Gamma UCL
Cadmium	6/18	na*	na	0.47	0.47	Maximum Detected Value
Acetone	3/18	na	na	0.01	0.01	Maximum Detected Value
Aroclor-1242	1/18	na	na	0.66	0.66	Maximum Detected Value
Aroclor-1254	2/18	na	na	0.382	0.382	Maximum Detected Value
Benzo(a)pyrene	1/18	na	na	0.0149	0.0149	Maximum Detected Value
Bis(2-ethylhexyl)phthalate	5/18	na	na	0.35	0.35	Maximum Detected Value
Isopropyltoluene[4-]	1/18	na	na	0.142	0.142	Maximum Detected Value
Methylnaphthalene[2-]	1/18	na	na	6.35	6.35	Maximum Detected Value
Phenanthrene	2/18	na	na	5.73	5.73	Maximum Detected Value
Pyrene	3/18	na	na	1.51	1.51	Maximum Detected Value
Toluene	3/18	na	na	0.00138	0.00138	Maximum Detected Value
Trichlorofluoromethane	3/18	na	na	0.00094	0.00094	Maximum Detected Value
Trimethylbenzene[1,2,4-]	1/18	na	na	0.203	0.203	Maximum Detected Value
Trimethylbenzene[1,3,5-]	1/18	na	na	0.256	0.256	Maximum Detected Value
Plutonium-239/240	1/18	na	na	0.151	0.151	Maximum Detected Value
Tritium	1/18	na	na	0.0089	0.0089	Maximum Detected Value

*na = Not available.

Table H-2.3-17
Residential and Ecological COPC Statistics for AOC 39-007(d)

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Cadmium	8/38	na*	na	0.47	0.47	Maximum Detected Value
Zinc	38/38	35.73	8.786	70.8	38.2	95% Modified-t UCL
Perchlorate	1/38	na	na	0.0048	0.0048	Maximum Detected Value
TCDD[2,3,7,8-] equivalent	37/37	0.0000000297	0.0000000624	0.000000257	0.0000000745	Use 95% Chebyshev (Mean, Sd) UCL
Acetone	6/38	na	na	0.0507	0.0507	Maximum Detected Value
Anthracene	1/38	na	na	0.183	0.183	Maximum Detected Value
Aroclor-1242	2/38	na	na	0.66	0.66	Maximum Detected Value
Aroclor-1254	3/38	na	na	0.382	0.382	Maximum Detected Value
Benzo(a)pyrene	1/38	na	na	0.0149	0.0149	Maximum Detected Value
Bis(2-ethylhexyl)phthalate	10/38	na	na	0.53	0.53	Maximum Detected Value
Bromomethane	1/38	na	na	0.00067	0.00067	Maximum Detected Value
Diphenylamine	1/22	na	na	1.85	1.85	Maximum Detected Value
Fluorene	1/38	na	na	0.265	0.265	Maximum Detected Value
Isopropyltoluene[4-]	2/38	na	na	0.142	0.142	Maximum Detected Value
Methylene chloride	22/38	0.00297	0.00116	0.00533	0.00337	95% KM (t) UCL
Methylnaphthalene[2-]	2/38	na	na	6.35	6.35	Maximum Detected Value
Phenanthrene	3/38	na	na	5.73	5.73	Maximum Detected Value
Pyrene	4/38	na	na	1.51	1.51	Maximum Detected Value
Toluene	3/38	na	na	0.00138	0.00138	Maximum Detected Value
Trichlorofluoromethane	10/38	na	na	0.0013	0.0013	Maximum Detected Value
Trimethylbenzene[1,2,4-]	1/38	na	na	0.203	0.203	Maximum Detected Value
Trimethylbenzene[1,3,5-]	2/38	na	na	0.256	0.256	Maximum Detected Value
Plutonium-239/240	1/38	na	na	0.151	0.151	Maximum Detected Value
Tritium	4/38	na	na	0.423	0.423	Maximum Detected Value

*na = Not available.

Table H-2.3-18
Industrial COPC Statistics for SWMU 39-010

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
TCDD[2,3,7,8-] equivalent	1/1	na*	na	0.00000236	0.00000236	Maximum Detected Value
Copper	18/18	91.93	257.5	1100	695.7	99% Chebyshev (Mean, Sd) UCL
Lead	18/18	17.47	13.73	55.4	23.65	95% Approximate Gamma UCL
Mercury	16/18	0.21	0.266	1.06	0.493	95% KM (Chebyshev) UCL
Cesium-137	5/18	0.116	0.0829	0.377	0.225	95% KM (Percentile Bootstrap) UCL
Uranium-234	18/18	2.921	1.785	7.3	3.653	95% Student's-t UCL
Uranium-235/236	14/18	0.268	0.218	0.9	0.372	95% KM (BCA) UCL
Uranium-238	18/18	11.04	13.37	56.2	17.28	95% Approximate Gamma UCL
Antimony	1/18	na	na	1.19	1.19	Maximum Detected Value
Perchlorate	3/18	na	na	0.00486	0.00486	Maximum Detected Value
Amino-2,6-dinitrotoluene[4-]	1/16	na	na	0.0064	0.0064	Maximum Detected Value
Amino-4,6-dinitrotoluene[2-]	1/16	na	na	0.0099	0.0099	Maximum Detected Value
Aroclor-1254	1/18	na	na	0.0015	0.0015	Maximum Detected Value
Aroclor-1260	1/18	na	na	0.0049	0.0049	Maximum Detected Value
Benzo(a)anthracene	1/18	na	na	0.094	0.094	Maximum Detected Value
Benzo(a)pyrene	1/18	na	na	0.12	0.12	Maximum Detected Value
Benzo(b)fluoranthene	1/18	na	na	0.097	0.097	Maximum Detected Value
Benzo(g,h,i)perylene	1/18	na	na	0.072	0.072	Maximum Detected Value
Benzo(k)fluoranthene	1/18	na	na	0.1	0.1	Maximum Detected Value
Chloromethane	1/6	na	na	0.00053	0.00053	Maximum Detected Value
Chrysene	1/18	na	na	0.12	0.12	Maximum Detected Value

Table H-2.3-18 (continued)

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Di-n-butylphthalate	4/18	na	na	2.76	2.76	Maximum Detected Value
Fluoranthene	1/18	na	na	0.19	0.19	Maximum Detected Value
HMX	2/18	na	na	0.036	0.036	Maximum Detected Value
Indeno(1,2,3-cd)pyrene	1/18	na	na	0.065	0.065	Maximum Detected Value
Phenanthrene	1/18	na	na	0.064	0.064	Maximum Detected Value
Pyrene	1/18	na	na	0.18	0.18	Maximum Detected Value
Trinitrotoluene[2,4,6-]	1/18	na	na	0.033	0.033	Maximum Detected Value
Tritium	1/18	na	na	0.037	0.037	Maximum Detected Value

*na = Not available.

Table H-2.3-19
Residential and Ecological COPC Statistics for SWMU 39-010

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Aluminum	53/54	2184	1317	5140	2972	95% KM (Chebyshev) UCL
TCDD[2,3,7,8-] equivalent	1/1	na*	na	0.00000236	0.00000236	Maximum Detected Value
Arsenic	48/54	0.874	0.331	2.1	0.949	95% KM (BCA) UCL
Barium	53/54	46.4	26.91	150	52.68	95% KM (Percentile Bootstrap) UCL
Cadmium	24/54	0.0714	0.0909	0.54	0.0987	95% KM (% Bootstrap) UCL
Chromium	46/54	3.589	5.06	38.8	6.623	95% KM (Chebyshev) UCL
Copper	53/54	108.9	389.6	2530	443.2	97.5% KM (Chebyshev) UCL
Iron	53/54	4736	2812	11300	6420	95% KM (Chebyshev) UCL
Lead	53/54	15.97	13.91	62	24.3	95% KM (Chebyshev) UCL
Magnesium	53/54	467.6	344.3	1160	673.8	95% KM (Chebyshev) UCL
Manganese	53/54	178.1	83.49	333	228.1	95% KM (Chebyshev) UCL
Mercury	39/54	0.237	0.454	2.47	0.51	95% KM (Chebyshev) UCL
Nickel	53/54	2.758	2.576	18.7	3.366	95% KM (BCA) UCL
Vanadium	53/54	5.119	3.702	13.1	7.336	95% KM (Chebyshev) UCL
Zinc	53/54	31.78	20.38	138	36.88	95% KM (BCA) UCL
Di-n-butylphthalate	15/54	0.233	0.638	3.8	0.628	95% KM (Chebyshev) UCL
Uranium-234	54/54	3.974	7.49	55	4.606	95% H-UCL
Uranium-235/236	36/54	0.485	1.417	10.5	0.874	95% KM (BCA) UCL
Uranium-238	54/54	17.83	48.47	344	24.42	95% H-UCL
Antimony	2/54	na	na	1.19	1.19	Maximum Detected Value
Perchlorate	8/54	na	na	0.00486	0.00486	Maximum Detected Value
Amino-2,6-dinitrotoluene[4-]	2/39	na	na	0.016	0.016	Maximum Detected Value
Amino-4,6-dinitrotoluene[2-]	1/39	na	na	0.0099	0.0099	Maximum Detected Value
Aroclor-1254	3/49	na	na	0.0147	0.0147	Maximum Detected Value

Table H-2.3-19 (continued)

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Aroclor-1260	3/49	na	na	0.0041	0.0041	Maximum Detected Value
Benzo(a)anthracene	2/42	na	na	0.094	0.094	Maximum Detected Value
Benzo(a)pyrene	2/42	na	na	0.12	0.12	Maximum Detected Value
Benzo(b)fluoranthene	2/42	na	na	0.097	0.097	Maximum Detected Value
Benzo(g,h,i)perylene	1/42	na	na	0.072	0.072	Maximum Detected Value
Benzo(k)fluoranthene	2/42	na	na	0.1	0.1	Maximum Detected Value
Bis(2-ethylhexyl)phthalate	4/42	na	na	0.84	0.84	Maximum Detected Value
Chloromethane	1/30	na	na	0.00053	0.00053	Maximum Detected Value
Chrysene	2/42	na	na	0.12	0.12	Maximum Detected Value
Fluoranthene	2/42	na	na	0.19	0.19	Maximum Detected Value
Butylbenzylphthalate	1/7	na	na	0.24	0.24	Maximum Detected Value
Hexanone[2-]	1/30	na	na	0.0038	0.0038	Maximum Detected Value
HMX	10/49	na	na	2.6	2.6	Maximum Detected Value
Indeno(1,2,3-cd)pyrene	1/42	na	na	0.065	0.065	Maximum Detected Value
Phenanthrene	2/42	na	na	0.064	0.064	Maximum Detected Value
Pyrene	2/42	na	na	0.18	0.18	Maximum Detected Value
RDX	5/49	na	na	25.3	25.3	Maximum Detected Value
Trimethylbenzene[1,3,5-]	2/30	na	na	0.0005	0.0005	Maximum Detected Value
Trinitrotoluene[2,4,6-]	3/49	na	na	0.293	0.293	Maximum Detected Value
Cesium-137	3/54	na	na	0.205	0.205	Maximum Detected Value
Tritium	4/54	na	na	3.91	3.91	Maximum Detected Value

*na = Not available.

Table H-2.3-20
Recreational, Residential, and Ecological COPC Statistics for Extended Drainages

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Arsenic	184/192	0.909	0.392	2	0.953	95% KM (BCA) UCL
Cadmium	57/192	0.0815	0.103	0.92	0.0959	95% KM (t) UCL
Copper	186/192	27.16	141.3	1650	71.72	95% KM (Chebyshev) UCL
Cyanide (total)	49/192	0.153	0.0582	0.48	0.164	95% KM (% Bootstrap) UCL
Lead	192/192	9.882	10.22	112	10.29	95% H-UCL
Mercury	138/192	0.39	2.492	28.2	1.518	97.5% KM (Chebyshev) UCL
Zinc	192/192	33.96	17.54	150	36.05	Use95% Student's-t UCL
Uranium-234	190/192	1.766	3.654	37.6	2.246	95% KM (BCA) UCL
Uranium-235/236	85/187	0.152	0.334	3.01	0.195	95% KM (% Bootstrap) UCL
Uranium-238	191/192	5.469	16.42	144	10.65	95% KM (Chebyshev) UCL
Perchlorate	32/192	na*	na	0.02	0.02	Maximum Detected Value
Selenium	38/172	na	na	0.21	0.21	Maximum Detected Value
Acenaphthene	1/192	na	na	0.037	0.037	Maximum Detected Value
Acetone	3/138	na	na	0.042	0.042	Maximum Detected Value
Anthracene	1/192	na	na	0.052	0.052	Maximum Detected Value
Aroclor-1242	5/192	na	na	0.0096	0.0096	Maximum Detected Value
Aroclor-1254	18/192	na	na	0.0398	0.0398	Maximum Detected Value
Aroclor-1260	7/192	na	na	0.0779	0.0779	Maximum Detected Value
Benzo(a)anthracene	2/192	na	na	0.16	0.16	Maximum Detected Value
Benzo(a)pyrene	3/192	na	na	0.18	0.18	Maximum Detected Value
Benzo(b)fluoranthene	3/192	na	na	0.13	0.13	Maximum Detected Value
Benzo(g,h,i)perylene	3/192	na	na	0.094	0.094	Maximum Detected Value
Benzo(k)fluoranthene	2/192	na	na	0.18	0.18	Maximum Detected Value
Bis(2-ethylhexyl)phthalate	37/192	na	na	0.72	0.72	Maximum Detected Value
Bromomethane	1/138	na	na	0.00045	0.00045	Maximum Detected Value
Butylbenzylphthalate	3/192	na	na	0.14	0.14	Maximum Detected Value

Table H-2.3-20 (continued)

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Chloromethane	3/138	na	na	0.00064	0.00064	Maximum Detected Value
Chrysene	2/192	na	na	0.00064	0.00064	Maximum Detected Value
Di-n-butylphthalate	4/192	na	na	0.17	0.17	Maximum Detected Value
Dibenz(a,h)anthracene	1/192	na	na	0.036	0.036	Maximum Detected Value
Dichlorobenzene[1,2-]	1/330	na	na	0.00065	0.00065	Maximum Detected Value
Dichlorobenzene[1,4-]	2/330	na	na	0.00072	0.00072	Maximum Detected Value
Dinitrotoluene[2,4-]	1/357	na	na	0.0037	0.0037	Maximum Detected Value
Fluoranthene	5/192	na	na	0.37	0.37	Maximum Detected Value
HMX	4/191	na	na	0.96	0.96	Maximum Detected Value
Indeno(1,2,3-cd)pyrene	2/192	na	na	0.083	0.083	Maximum Detected Value
Iodomethane	2/138	na	na	0.00054	0.00054	Maximum Detected Value
Isopropyltoluene[4-]	8/138	na	na	0.0091	0.0091	Maximum Detected Value
Methylene chloride	5/138	na	na	0.012	0.012	Maximum Detected Value
Nitrotoluene[4-]	1/166	na	na	0.23	0.23	Maximum Detected Value
PETN	1/165	na	na	0.36	0.36	Maximum Detected Value
Phenanthrene	2/192	na	na	0.23	0.23	Maximum Detected Value
Pyrene	5/192	na	na	0.36	0.36	Maximum Detected Value
RDX	1/192	na	na	0.32	0.32	Maximum Detected Value
Styrene	1/138	na	na	0.00037	0.00037	Maximum Detected Value
TATB	3/191	na	na	11.6	11.6	Maximum Detected Value
Toluene	17/138	na	na	0.0041	0.0041	Maximum Detected Value
Trichlorofluoromethane	2/138	na	na	0.0014	0.0014	Maximum Detected Value
Trimethylbenzene[1,2,4-]	27/138	na	na	0.00074	0.00074	Maximum Detected Value
Trinitrotoluene[2,4,6-]	1/181	na	na	0.0056	0.0056	Maximum Detected Value
Tritium	9/192	na	na	0.65	0.65	Maximum Detected Value
TCDD[2,3,7,8-] equivalent	1/1	na	na	0.0000000333	0.0000000333	Maximum Detected Value

*na = Not available.

Table H-2.3-21
Residential COPC Statistics for SWMU 39-001(b)

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Lead	23/23	7.009	4.328	23.7	8.65	or 95% Modified-t UCL
Mercury	6/23	0.198	0.799	3.94	2.014	99% KM (Chebyshev) UCL
Vanadium	23/23	9.548	9.611	48	18.28	Use 95% Chebyshev (Mean, Sd) UCL
Zinc	23/23	25.25	5.686	44	27.27	Use 95% Approximate Gamma UCL
Cyanide (total)	1/23	na*	na	0.13	0.13	Maximum Detected Value
Acenaphthene	1/23	na	na	0.31	0.31	Maximum Detected Value
Aroclor-1254	2/23	na	na	0.046	0.046	Maximum Detected Value
Benzo(a)anthracene	2/23	na	na	0.079	0.079	Maximum Detected Value
Benzo(a)pyrene	2/23	na	na	0.083	0.083	Maximum Detected Value
Benzo(b)fluoranthene	2/23	na	na	0.066	0.066	Maximum Detected Value
Benzo(g,h,i)perylene	1/23	na	na	0.06	0.06	Maximum Detected Value
Benzo(k)fluoranthene	2/23	na	na	0.067	0.067	Maximum Detected Value
Bis(2-ethylhexyl)phthalate	3/23	na	na	0.12	0.12	Maximum Detected Value
Chrysene	2/23	na	na	0.088	0.088	Maximum Detected Value
Fluoranthene	2/23	na	na	0.2	0.2	Maximum Detected Value
HMX	3/23	na	na	0.046	0.046	Maximum Detected Value
Indeno(1,2,3-cd)pyrene	1/23	na	na	0.052	0.052	Maximum Detected Value
Phenanthrene	2/23	na	na	0.13	0.13	Maximum Detected Value
Pyrene	2/23	na	na	0.17	0.17	Maximum Detected Value
RDX	3/23	na	na	0.12	0.12	Maximum Detected Value
Toluene	1/23	na	na	0.00037	0.00037	Maximum Detected Value
Trimethylbenzene[1,2,4-]	2/23	na	na	0.00052	0.00052	Maximum Detected Value
Tritium	4/23	na	na	2.18	2.18	Maximum Detected Value
TCDD[2,3,7,8-] equivalent	1/1	na	na	0.00000000245	0.00000000245	Maximum Detected Value

*na = Not available.

Table H-2.3-22
Residential COPC Statistics for SWMU 39-006(a) Inactive Components

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Cadmium	25/29	0.442	1.247	6.7	1.919	97.5% KM (Chebyshev) UCL
Cyanide (total)	23/29	1.64	2.905	10.9	7.129	99% KM (Chebyshev) UCL
Nitrate	25/29	10.15	14.71	68.2	22.3	95% KM (Chebyshev) UCL
Silver	28/29	10.27	41.25	227	87.88	99% KM (Chebyshev) UCL
Aroclor-1254	11/29	0.0165	0.0163	0.072	0.023	95% KM (t) UCL
Bis(2-ethylhexyl)phthalate	11/29	0.355	0.457	2	0.509	95% KM (t) UCL
Perchlorate	8/29	na*	na	0.00324	0.00324	Maximum Detected Value
Cesium-137	1/29	na	na	0.308	0.308	Maximum Detected Value
Tritium	3/29	na	na	2.02	2.02	Maximum Detected Value
Acetone	3/29	na	na	0.011	0.011	Maximum Detected Value
Benzene	1/29	na	na	0.0088	0.0088	Maximum Detected Value
Di-n-butylphthalate	1/29	na	na	0.039	0.039	Maximum Detected Value
Iodomethane	1/29	na	na	0.0009	0.0009	Maximum Detected Value
Isopropyltoluene[4-]	1/29	na	na	0.00059	0.00059	Maximum Detected Value
Phenol	1/29	na	na	0.49	0.49	Maximum Detected Value
Toluene	2/29	na	na	0.00048	0.00048	Maximum Detected Value
Trimethylbenzene[1,2,4-]	2/29	na	na	0.00056	0.00056	Maximum Detected Value
TCDD[2,3,7,8-] equivalent	1/1	na	na	0.0000000195	0.0000000195	Maximum Detected Value

*na = Not available.

Table H-2.3-23
Ecological COPC Statistics for SWMU 39-006(a) Inactive Components

COPC	Proportion of Detects	Mean (mg/kg)	Standard Deviation (mg/kg)	Maximum Detected Value (mg/kg)	EPC (mg/kg)	EPC Method
Acetone	5/54	na*	na	0.013	0.013	Maximum Detected Value
Aroclor-1254	4/10	0.0103	0.0126	0.048	0.0188	95% KM (t) UCL
Benzene	1/1	na	na	0.0088	0.0088	Maximum Detected Value
Bis(2-ethylhexyl)phthalate	4/10	0.265	0.117	0.54	0.42	95% KM (Percentile Bootstrap) UCL
Cadmium	9/10	0.0701	0.0391	0.17	0.0942	95% KM (Percentile Bootstrap) UCL
Cesium-137	1/54	na	na	0.308	0.308	Maximum Detected Value
Cyanide (total)	8/10	1.258	2.293	8.02	4.637	95% KM (Chebyshev) UCL
Di-n-butylphthalate	1/54	na	na	0.039	0.039	Maximum Detected Value
Iodomethane	1/54	na	na	0.0009	0.0009	Maximum Detected Value
Isopropyltoluene[4-]	1/54	na	na	0.00059	0.00059	Maximum Detected Value
Nitrate	7/10	17.89	22.42	68.2	65.71	97.5% KM (Chebyshev) UCL
Perchlorate	3/10	0.000873	0.000789	0.00324	0.00324	95% KM (% Bootstrap) UCL
Phenol	1/1	na	na	0.49	0.49	Maximum Detected Value
Silver	10/10	0.543	0.686	2.2	1.128	95% Approximate Gamma UCL
Toluene	2/54	na	na	0.00048	0.00048	Maximum Detected Value
Trimethylbenzene[1,2,4-]	5/54	na	na	0.0056	0.00056	Maximum Detected Value
Tritium	6/54	na	na	2.02	2.02	Maximum Detected Value
TCDD[2,3,7,8-] equivalent	1/1	na	na	0.0000000195	0.0000000195	Maximum Detected Value

*na = Not available.

Table H-3.2-1
Physical and Chemical Properties of Inorganic COPCs

COPC	K_d [a] (cm^3/g)	Water Solubility[a,b] (g/L)
Aluminum	1500	Insoluble
Arsenic	29	Insoluble
Antimony	45	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	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.

Table H-3.2-2
Physical and Chemical Properties of Organic COPCs

COPC	Organic Carbon Partition Coefficient, K_{oc}[a] (L/kg)	Log Octanol-Water Partition Coefficient, K_{ow}[a]	Water Solubility (mg/L)[a]	Vapor Pressure[a] (mm Hg at 25°C)
Acenaphthene	6.12E+03	3.92E+00[b]	3.6E+00[b]	2.5E-03[b]
Acenaphthylene	6.12E+03	3.94E+00	1.61E+01	9.12E-04
Acetone	1.98E+00	-2.40E-01[b]	1.00E+06[b]	2.31E+02[b]
Amino-4,6-dinitrotoluene [2-]	1.01E+02	1.84E+00	1.22E+03	3.33E-06
Amino-2,6-dinitrotoluene [4-]	1.01E+02	1.84E+00	1.22E+03	3.65E-06
Anthracene	2.04E+04	4.45E+00[b]	4.34E-02[b]	2.67E-06[b]
Aroclor-1242	4.48E+04	6.29E+00	2.77E-01	8.63E-05
Aroclor-1248	4.39E+04[c]	6.34E+00	5.32E-02[c]	4.94E-04
Aroclor-1254	5.30E+05[c]	6.79E+00[b]	3.40E-03[b]	6.53E-06[b]
Aroclor-1260	5.30E+05[c]	8.27E+00[b]	2.84E-04[b]	4.05E-05[b]
Benzene	1.66E+02[c]	2.13E+00	5.32E-02[c]	4.94E-04
Benzo(a)anthracene	2.31E+05	5.76E+00[b]	9.40E-03[b]	1.90E-06[b]
Benzo(a)pyrene	7.87E+05	6.13E+00[b]	1.62E-03[b]	5.49E-09[b]
Benzo(b)fluoranthene	8.03E+05	5.78E+00[b]	1.50E-03[b]	5.00E-07[b]
Benzo(g,h,i)perylene	2.68E+06	6.63E+00[b]	2.60E-04[b]	1.00E-10[b]
Benzo(k)fluoranthene	7.87E+05	6.11E+00[b]	8.00E-04[b]	9.65E-10[b]
Benzoic acid	1.45E+01	1.87E+00[b]	3.40E+03[b]	7.00E-04[b]
Bis(2-ethylhexyl)phthalate	1.65E+05	7.60E+00[b]	2.70E-01[b]	1.42E-07[b]
Bromobenzene	2.68E+02	2.99E+00	4.46E+02	4.18E+00
Bromomethane	1.43E+01[c]	6.34E+00	5.32E-02[c]	4.94E-04
Butylbenzylphthalate	9.36E+03	4.73E+00	2.69E+00	8.25E-06
Chloromethane	1.43E+01[c]	9.10E-01	5.32E+03[c]	4.3E+03
Chrysene	2.36E+05	5.81E+00[b]	6.30E-03[b]	6.23E-09[b]
Dibenz(a,h)anthracene	2.62E+06	6.54E+00	1.03E-03	1.39E-11
Dibenzofuran	1.13E+04	4.12E+00	3.1E+00	2.48E-03
Dichlorobenzene[1,2-]	4.43E+02[c]	3.43E00	8.00E+01[c]	1.47E+00
Dichlorobenzene[1,4-]	4.34E+01	3.44E+00[b]	8.13E+01[b]	1.74E+00[b]
DDE[4,4'-]	1.53E+05	6.51E+00	4.0E-02	6.0E-06
DDT[4,4'-]	2.2E+05	6.91E+00	5.5E-03	1.6E-07
Dieldrin	1.06E+04	5.2E+00	2.5E-01	3.0E-06
Di-n-butylphthalate	1.46E+03	4.50E+00	1.12E+01	0.00E+00
Dinitroaniline [3,5-]	5.96E+02	1.89E+00	1.29E+03	8.54E-06
Dinitro-2-methylphenol[4,6-]	na[d]	na	na	na
Dinitrotoluene [2,4]	3.64E+02[c]	1.98E+00	2.70E+02[c]	1.47E-04
Di-n-octylphthalate	1.96E+05	8.1E+00	2.0E-02	1.0E-07
Diphenylamine	1.89E+03	3.50E+00	5.30E+02	6.70E+04

Table H-3.2-2 (continued)

COPC	Organic Carbon Partition Coefficient, K_{oc}[a] (L/kg)	Log Octanol-Water Partition Coefficient, K_{ow}[a]	Water Solubility (mg/L)[a]	Vapor Pressure[a] (mm Hg at 25°C)
Ethylbenzene	5.18E+02	3.15E+00	1.69E+02	9.6E+00
Fluoranthene	7.09E+04[c]	5.16E+00[c]	2.60E-01[c]	9.22E-06[c]
Fluorene	1.13E+04	4.18E+00[b]	1.89E+00[b]	8.42E-03[b]
Hexanone[2-]	1.3E+01	1.38E+00	1.75E+04	1.16E+01
HMX	1.85E+03[c]	1.60E-01	9.44E+03[c]	3.30E-14
Indeno(1,2,3-cd)pyrene	2.68E+06	6.70E+00[b]	1.90E-04[b]	1.25E-10[b]
Iodomethane	1.43E+01	1.51E+00	1.38E+04	4.05E+02
Isopropylbenzene	8.17E+02	3.66E+00	6.13E+01	4.5E+00
Isopropyltoluene[4-]	na	4.10E+00[b]	2.34E+01[b]	1.64E+00[b]
Methylene chloride	2.37E+01	1.30E+00[b]	1.30E+04[b]	4.30E+02[b]
Methylnaphthalene[2-]	2.98E+03	3.86E+00	2.46E+01	5.5E-02
Naphthalene	1.84E+03	3.3E+00	3.1E+01	8.5E-02
Nitrotoluene[4-]	3.09E+02[c]	2.37E+00	4.42E+02[c]	1.57E-02
PETN	7.58E+02	2.38E+00	4.30E+01	5.45E-09
Phenanthrene	2.08E+04	4.46E+00[b]	1.15E+00[b]	1.12E-04[b]
Pyrene	6.94E+04	4.88E+00[b]	1.35E-01[b]	4.50E-06[b]
RDX	1.95E+02[c]	8.70E-01	5.97E+01[c]	4.10E-09
Styrene	5.18E+02	2.95E+00	3.1E+02	6.4E+00
TATB	na	na	na	na
TCDD [2,3,7,8-]	1.46E+05[c]	6.8E+00	2.00E-04[c]	1.50E-09
Tetryl	2.14E+03[c]	1.64E+00	7.40E+01[c]	1.17E-09
Toluene	2.68E+02	2.73E+00	5.26E+02	2.84E+01
TPH-DRO	na	na	na	na
Trichloroethene	6.77E+01[c]	2.42E+00	1.28E+03[c]	6.90E+01
Trichlorofluoromethane	4.86E+01	2.53E+00	1.1E+03	8.03E+02
Trimethylbenzene[1,2,4-]	7.18E+02	3.63E+00	5.7E+01	2.1E+00
Trimethylbenzene[1,3,5-]	7.03E+02	3.42E+00	4.82E+01	2.1E+00
Trinitrobenzene[1,3,5-]	1.09E+03	1.18E+00	2.78E+02	6.44E-06
Trinitrotoluene [2,4,6-]	1.85E+03	1.60E+00	1.38E+02	8.02E-06
Xylene[1,2-]	4.34E+02	3.2E+00	1.61E+02	8.29E+00
Xylene(1,3-)	4.43E+02	3.12E+00	1.06E+02	7.99E+00
Xylene[1,3-]+Xylene[1,4-]	4.43E+02	3.12E+00	1.06E+02	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 (2009, 106420).

[d] na = Not available.

Table H-3.2-3
Physiochemical Properties of Radionuclide COPCs

COPC	Soil-Water Partition Coefficient, K_d [a] (cm^3/g)	Water Solubility [b] (g/L)
Americium-241	680	Insoluble
Cesium-137	1000	Insoluble
Plutonium-238	4500	Insoluble
Plutonium-239	4500	Insoluble
Tritium	9.9	Soluble
Uranium-234	0.4	Insoluble
Uranium-235	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 H-3.3-1
Toxic Equivalency Factors (TEFs)
Used for Calculating TCDD Equivalent Concentrations

Dioxin and Furan Congeners	WHO 1995* TEF
Tetrachlorodibenzodioxin[2,3,7,8-]	1
Pentachlorodibenzodioxin[1,2,3,7,8-]	1
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	0.1
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	0.1
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	0.1
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	0.01
Octachlorodibenzodioxin	0.0003
Tetrachlorodibenzofuran[2,3,7,8-]	0.1
Pentachlorodibenzofuran[1,2,3,7,8-]	0.03
Pentachlorodibenzofuran[2,3,4,7,8-]	0.3
Hexachlorodibenzofuran[1,2,3,4,7,8-]	0.1
Hexachlorodibenzofuran[1,2,3,6,7,8-]	0.1
Hexachlorodibenzofuran[1,2,3,7,8,9-]	0.1
Hexachlorodibenzofuran[2,3,4,6,7,8-]	0.1
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	0.01
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	0.01
Octachlorodibenzofuran	0.0003

*http://www.epa.gov/ncea/pdfs/dioxin/part2/drich9.pdf.

Table H-4.1-1
Parameters Used to Calculate Chemical SSLs

Parameters	Residential Values	Industrial Values	Recreational Values
Target HQ	1	1	1
Target cancer risk	10^{-5}	10^{-5}	10^{-5}
Averaging time (carcinogen)	70 yr × 365 days	70 yr × 365 days	70 yr × 365 days
Averaging time (noncarcinogen)	ED × 365 days	ED × 365 days	ED × 365 days
Skin absorption factor	Semivolatile organic compound (SVOC) = 0.1; Chemical-specific	SVOC = 0.1; Chemical-specific	SVOC = 0.1; Chemical-specific
Adherence factor–child	0.2 mg/cm^2	n/a[a]	0.2 mg/cm^2
Body weight–child	15 kg (age: 0–6 yr)	n/a	31 kg (age: 6–11 yr)
Cancer slope factor–oral (chemical-specific)	(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)$^{-1}$
Exposure frequency	350 day/yr	225 day/yr	200 events/yr
Exposure duration–child	6 yr	n/a	6 yr
Age-adjusted ingestion factor	114 mg-yr/kg-day	n/a	22.6 mg/kg-day
Age-adjusted inhalation factor	11 m^3-yr/kg-day	n/a	0.8 m^3-yr/kg-day
Inhalation rate–child	10 m^3/day	n/a	1.2 m^3/hr
Soil ingestion rate–child	200 mg/day	n/a	71.4 mg/day
Particulate emission factor	6.61 × 10^9 m^3/kg	6.61 × 10^9 m^3/kg	6.61 × 10^9 m^3/kg
RfD–oral (chemical-specific)	(mg/kg-day)	(mg/kg-day)	(mg/kg-day)
RfD–inhalation (chemical-specific)	(mg/kg-day)	(mg/kg-day)	(mg/kg-day)
Exposed surface area–child	2800 cm^2/day	n/a	3525 cm^2/day
Age-adjusted skin contact factor (carcinogens)	361 mg-yr/kg-day	n/a	273.3 mg-yr/kg-day
VF for soil (chemical-specific)	(m^3/kg)	(m^3/kg)	(m^3/kg)
Body weight–adult	70 kg	70 kg	70 kg
Exposure duration[b]	30 yr	25 yr	30 yr
Adherence factor–adult	0.07 mg/cm^2	0.2 mg/cm^2	0.07 mg/cm^2
Soil ingestion rate–adult	100 mg/day	100 mg/day	25.6 mg/day
Exposed surface area–adult	5700 cm^2/day	3300 cm^2/day	5700 cm^2/day
Inhalation rate–adult	20 m^3/day	20 m^3/day	1.6 m^3/hr

Note: Parameter values from NMED (2009, 106420).

[a] n/a = Not applicable.

[b] Exposure duration for lifetime resident is 30 yr. For carcinogens, the exposures are combined for child (6 yr) and adult (24 yr).

Table H-4.1-2
Parameters Used in the SAL Calculations for Radionuclides, Residential

Parameters	Residential, Child	Residential, Adult
Inhalation rate (m^3/yr)	3652.5[a]	7305[b]
Mass loading (g/m^3)	1.5×10^{-7} [c]	1.5×10^{-7} [c]
Outdoor time fraction	0.2236[d]	0.0599[e]
Indoor time fraction	0.7347[f]	0.8984[g]
Soil ingestion (g/yr)	73[h]	36.5[i]

[a] Calculated as (10 m^3/d × 350 d/yr] / (indoor + outdoor time fractions], where 10 m^3/d is the daily inhalation rate of a child (NMED 2009, 106420).

[b] Calculated as (20 m^3/d × 350 d/yr] / (indoor + outdoor time fractions], where 20 m^3/d is the daily inhalation rate of an adult (NMED 2009, 106420).

[c] Calculated as (1/ $6.6 \times 10^{+9}$ m^3/kg) x 1000 g/kg, where 6.6 x 10^{+9} m^3/kg is the particulate emission factor (NMED 2009, 106420).

[d] Calculated as (5.6 hr/d × 350 d/yr] / 8766 hr/yr, where 5.6 hr/dis an estimate of time spent outdoors for a 3- to 11-yr-old child (EPA 1997, 066598, section 15.4-1).

[e] Calculated as (1.5 hr/d × 350 d/yr] / 8766 hr/yr, where 1.5 hr/d is an estimate of time spent outdoors for an adult 12 yr and older (EPA 1997, 066598, section 15.4-1).

[f] Calculated as [(24–5.6 hr/d × 350 d/yr] / 8766 hr/yr.

[g] Calculated as [(24–1.5 hr/d × 350 d/yr] / 8766 hr/yr.

[h] Calculated as [0.2 g/d × 350 d/yr] / [indoor + outdoor time fractions], where 0.2 g/d is the child soil-ingestion rate (NMED 2009, 106420).

[i] Calculated as [0.1 g/d × 350 d/yr] / [indoor + outdoor time fractions], where 0.1 g/d is the adult soil-ingestion rate (NMED 2009, 106420).

Table H-4.1-3
Parameters Used in the SAL Calculations for Radionuclides, Industrial

Parameters	Industrial, Adult
Inhalation rate (m^3/yr)	19,481[a]
Mass loading (g/m^3)	1.5×10^{-7} [b]
Outdoor time fraction	0.2053[c]
Indoor time fraction	0
Soil ingestion (g/yr)	97.4[d]

[a] Calculated as [20 m^3/day × 225 d/yr] / [indoor + outdoor time fractions], where 20 m^3/d is the daily inhalation rate of an adult and 225 d/yr is the exposure frequency (NMED 2009, 106420).

[b] Calculated as [1/ $6.6 \times 10^{+9}$ m^3/kg] × 1000 g/kg, where $6.6 \times 10^{+9}$ m^3/kg is the particulate emission factor (NMED 2009, 106420).

[c] Calculated as [8 hr/d × 225 d/yr] / 8766 hr/yr, where 8 hr/d is an estimate of the average length of the work day.

[d] Calculated as [0.1 g/d × 225 d/yr] / [indoor + outdoor time fractions], where 0.1 g/d is the adult soil ingestion rate (NMED 2009, 106420).

Table H-4.1-4
Parameters Used in the SAL Calculations for Radionuclides, Recreational

Parameters	Recreational, Child	Recreational, Adult
Inhalation rate (m^3/yr)	10,526[a]	14,035[b]
Mass loading (g/m^3)	1.5 × 10-7[c]	1.5 x 10-7[c]
Outdoor time fraction	0.0228[d]	0.0228[d]
Indoor time fraction	0	0
Soil ingestion (g/yr)	626[e]	225[f]

[a] Calculated as [1.2 m^3/hr × 200 hr/yr] / [indoor + outdoor time fractions], where 1.2 m^3/hr is the child inhalation rate for moderate activity (EPA 1997, 066596, Table 5-23).

[b] Calculated as [1.60 m^3/hr × 200 hr/yr] / [indoor + outdoor time fractions], where 1.6 m^3/d is the adult inhalation rate for moderate activity (EPA 1997, 066596, Table 5-23).

[c] Calculated as [1/ 6.6 × 10^{+9} m^3/kg) x 1000 g/kg, where 6.6 x 10^{+9} m^3/kg is the particulate emission factor (NMED 2009, 106420).

[d] Calculated as [1 hr/d × 200 d/yr] / 8766 hr/yr, where 1 hr/d is an estimate of the exposure time for a recreational adult or child (LANL 2007, 094496). Calculated as [(0.4 g/d × 5.6 hr/day) × 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/d is the upper bound child soil-ingestion rate (EPA 1997, 066598, Table 4-23).

[f] Calculated as [(0.1 g/d × 3.9 hr/day) × 200 hr/yr] / [indoor + outdoor time fractions], where 3.9 hr/d is the time-weighted average for "doers" ages 12–44 (EPA 1997, 066598, Table 15-10), and where 0.1 g/d is the adult soil-ingestion rate (NMED 2009, 106420).

Table H-4.2-1
Industrial Screening for Carcinogens for SWMU 39-002(a) Area 1

COPC	EPC[a] (mg/kg)	Industrial SSL[b] (mg/kg)	Cancer Risk
TCDD[2,3,7,8-] equivalent	0.000000348	0.000204	1.71E-08
Aroclor-1254	0.203	8.26	2.46E-07
Aroclor-1260	0.155	8.26	1.88E-07
Benzo(a)anthracene	2.235	23.4	9.55E-07
Benzo(a)pyrene	3.621	2.34	1.55E-05
Benzo(b)fluoranthene	3.648	23.4	1.56E-06
Benzo(k)fluoranthene	2.087	234	8.92E-08
Bis(2-ethylhexyl)phthalate	0.311	1370	2.27E-09
Chrysene	3.605	2340	1.54E-08
Dibenz(a,h)anthracene	0.5[c]	2.34	2.14E-06
Ethylbenzene	0.000718[c]	385	1.86E-11
Indeno(1,2,3-cd)pyrene	1.987	23.4	8.49E-07
Methylene chloride	0.00287[c]	1090	2.63E-11
Naphthalene	0.422	252	1.67E-08
Trichloroethene	0.000747[c]	253	2.95E-11
		Total Excess Cancer Risk	**2E-05**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420).

[c] Maximum detected concentration.

Table H-4.2-2
Industrial Screening for Noncarcinogens for SWMU 39-002(a) Area 1

COPC	EPC[a] (mg/kg)	Industrial SSL[b] (mg/kg)	HQs
Acenaphthene	0.596	36700	0.00002
Acenaphthylene	0.201[c]	18300	0.00001
Amino-2,6-dinitrotoluene[4-]	0.171[c]	2000[d]	0.00009
Anthracene	1.42	183000	0.00001
Antimony	2.46[c]	454	0.005
Benzo(g,h,i)perylene	2.095	18300	0.0001
Cadmium	0.76	1120	0.0007
Copper	116.2	45400	0.003
Cyanide (total)	20.8[c]	22700	0.0009
Di-n-butylphthalate	1.017	68400	0.00001
Dibenzofuran	0.513	1620[e]	0.0003
Fluoranthene	9.6	24400	0.0004
Fluorene	0.634	24400	0.00003
Lead	77.98	800	0.1
Mercury	1.408	310[d]	0.004
Methylnaphthalene[2-]	0.173	4100[d]	0.00004
Phenanthrene	7.787	20500	0.0004
Pyrene	8.04	18300	0.0004
Silver	0.51	5680	0.00009
Thallium	1.26[c]	74.9	0.02
Tetryl	0.345[c]	27400	0.00001
Toluene	0.0233[c]	57900	0.0000004
Trimethylbenzene[1,2,4-]	0.00047[c]	280[d]	0.000002
Trinitrotoluene[2,4,6-]	1.02[c]	469	0.002
Xylene[1,2-]	0.000624[c]	31500	0.00000002
Xylene[1,3-]+Xylene[1,4-]	0.00177[c]	3610[f]	0.0000005
Zinc	132.2	341000	0.0004
		HI	**0.1**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] Maximum detected concentration.

[d] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[e] SSL from NMED (2006, 092513).

[f] SSL for total xylenes used.

Table H-4.2-3
Industrial Screening for Radionuclides for SWMU 39-002(a) Area 1

COPC	EPC[a] (pCi/g)	Industrial SAL[b] (pCi/g)	Dose (mrem/yr)
Uranium-238	3.591	430	0.13
Tritium	0.113[c]	440000	0.000004
		Total Dose	**0.1**

[a] UCL used unless otherwise noted.

[b] SALs from NMED 2005, 088493.

[c] Maximum detected concentration.

Table H-4.2-4
Residential Screening for Carcinogens for SWMU 39-002(a) Area 1

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	Cancer Risk
TCDD[2,3,7,8-] equivalent	0.000000348	0.0000414	7.73E-08
Aroclor-1254	0.116	2.2[c]	5.27E-07
Aroclor-1260	0.155	1.7	9.12E-07
Benzo(a)anthracene	1.725	4.81	3.59E-06
Benzo(a)pyrene	1.983	0.481	4.12E-05
Benzo(b)fluoranthene	1.99	4.81	4.14E-06
Benzo(k)fluoranthene	1.117	48.1	2.32E-07
Bis(2-ethylhexyl)phthalate	0.216	280	7.71E-09
Chrysene	2.002	481	4.16E-08
Dibenz(a,h)anthracene	0.5[d]	0.481	1.04E-05
Ethylbenzene	0.000718[d]	69.6	1.03E-10
Indeno(1,2,3-cd)pyrene	1.093	4.81	2.27E-06
Methylene chloride	0.00345[d]	199	1.73E-10
Naphthalene	0.247	45	5.49E-08
Trichloroethene	0.00084[d]	45.7	1.84E-10
		Total Excess Cancer Risk	**6E-05**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[d] Maximum detected concentration.

Table H-4.2-5
Residential Screening for Noncarcinogens for SWMU 39-002(a) Area 1

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	HQs
Cadmium	0.625	77.9	0.008
Copper	62.22	3130	0.02
Lead	52.62	400	0.1
Mercury	0.646	23[c]	0.03
Silver	0.327	391	0.0008
Zinc	88.09	23500	0.004
Acenaphthene	0.347	3440	0.0001
Anthracene	0.557	17200	0.00003
Acenaphthylene	0.201[d]	1720[e]	0.0001
Amino-2,6-dinitrotoluene[4-]	0.171[d]	150[c]	0.001
Antimony	2.46[d]	31.3	0.08
Aroclor-1254	0.116	1.12	0.1
Benzo(g,h,i)perylene	1.158	1720[e]	0.0007
Cyanide (total)	20.8[d]	1560	0.01
Dibenzofuran	1.1[d]	142[f]	0.008
Dichlorobenzene[1,2-]	0.0007[d]	3010	0.0000002
Di-n-butylphthalate	0.564	6110	0.00009
Fluoranthene	5.162	2290	0.002
Fluorene	0.376	2290	0.0002
Methylnaphthalene[2-]	0.104	310[c]	0.0003
Perchlorate	0.000715[d]	54.8	0.00001
Phenanthrene	4.134	1830	0.002
Pyrene	4.342	1720	0.003
Thallium	1.26c	5.16	0.2
Tetryl	0.345[d]	244	0.001
Toluene	0.0233[d]	5570	0.000004
Trimethylbenzene[1,2,4-]	0.00047[d]	67[c]	0.000008
Trinitrotoluene[2,4,6-]	1.02[d]	35.9	0.03
Xylene[1,2-]	0.000624[d]	9550	0.0000007
Xylene[1,3-] + Xylene[1,4-]	0.00177	1090[g]	0.000002
		HI	**0.8**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[d] Maximum detected concentration.

[e] Pyrene used as a surrogate based on structural similarity.

[f] SSL from NMED (2006, 092513).

[g] SSL for total xylenes used.

Table H-4.2-6
Residential Screening for Radionuclides for SWMU 39-002(a) Area 1

COPC	EPC[a] (pCi/g)	Residential SAL[b] (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	0.105	33	0.05
Tritium	8.21	750	0.16
Uranium-238	2.384	86	0.42
		Total Dose	**0.6**

[a] Maximum detected concentration.

[b] SALs from LANL (2005, 088493).

Table H-4.2-7
Industrial Screening for Carcinogens for SWMU 39-002(a) Area 3

COPC	EPC[a] (mg/kg)	Industrial SSL[b] (mg/kg)	Cancer Risk
Aroclor-1254	0.013[c]	8.26	1.57E-08
Benzo(a)anthracene	0.13	23.4	5.56E-08
Benzo(a)pyrene	0.141	2.34	6.03E-07
Benzo(b)fluoranthene	0.117	23.4	5.00E-08
Benzo(k)fluoranthene	0.139	234	5.94E-09
Bis(2-ethylhexyl)phthalate	0.37	1370	2.70E-09
Chrysene	0.149	2340	6.37E-10
Methylene chloride	0.002[c]	1090	1.83E-11
Aroclor-1260	0.0091[c]	8.26	1.10E-08
Indeno(1,2,3-cd)pyrene	0.079[c]	23.4	3.38E-08
TCDD[2,3,7,8-] equivalent	0.00000113[c]	0.000204	5.53E-08
		Total Excess Cancer Risk	**8E-07**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420).

[c] Maximum detected concentration.

Table H-4.2-8
Industrial Screening for Noncarcinogens for SWMU 39-002(a) Area 3

COPC	EPC[a] (mg/kg)	Industrial SSL[b] (mg/kg)	HQs
Copper	37.83	45400	0.0008
Cyanide (total)	0.195	22700	0.000009
Benzo(g,h,i)perylene	0.0788	18300[c]	0.000004
Fluoranthene	0.255	24400	0.00001
Phenanthrene	0.199	20500	0.00001
Pyrene	0.236	18300	0.00001
Di-n-butylphthalate	0.54[d]	68400	0.000008
Anthracene	0.053[d]	183000	0.0000003
Trichlorofluoromethane	0.00037[d]	6760	0.00000005
		HI	**0.0009**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420).

[c] Pyrene used as a surrogate based on structural similarity.

[d] Maximum detected concentration.

Table H-4.2-9
Residential Screening for Carcinogens for SWMU 39-002(a) Area 3

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	Cancer Risk
TCDD[2,3,7,8-] equivalent	0.00000113[c]	0.0000414	2.72E-07
Aroclor-1254	0.013[c]	2.2[d]	5.91E-08
Aroclor-1260	0.0091[c]	1.7	5.35E-08
Benzo(a)anthracene	0.128	4.81	2.66E-07
Benzo(a)pyrene	0.129	0.481	2.68E-06
Benzo(b)fluoranthene	0.116	4.81	2.41E-07
Benzo(k)fluoranthene	0.137	48.1	2.85E-08
Bis(2-ethylhexyl)phthalate	0.267	280	9.54E-09
Chrysene	0.136	481	2.83E-09
Indeno(1,2,3-cd)pyrene	0.079[c]	4.81	1.64E-07
Methylene chloride	0.00214	199	1.08E-10
		Total Excess Cancer Risk	**4E-06**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] Maximum detected concentration.

[d] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table H-4.2-10
Residential Screening for Noncarcinogens for SWMU 39-002(a) Area 3

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	HQs
Antimony	0.94(U)[c]	31.3	0.03
Copper	31.44	3130	0.01
Cyanide (total)	0.193	1560	0.0001
Aroclor-1254	0.013[d]	1.12	0.01
Acetone	0.013[d]	67500	0.0000002
Anthracene	0.053[d]	17200	0.000003
Benzo(g,h,i)perylene	0.0779	1720[e]	0.00005
Di-n-butylphthalate	0.54[d]	6110	0.00009
Fluoranthene	0.185	2290	0.00008
Phenanthrene	0.165	1830	0.00009
Pyrene	0.183	1720	0.0001
Trichlorofluoromethane	0.00037[d]	2010	0.0000002
		HI	**0.05**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420).

[c] Antimony was not detected but had a detection limit above background.

[d] Maximum detected concentration.

[e] Pyrene used as a surrogate based on structural similarity.

Table H-4.2-11
Industrial Screening for Carcinogens for AOC 39-002(c)

COPC	EPC[a] (mg/kg)	Industrial SSL[b] (mg/kg)	Cancer Risk
TCDD[2,3,7,8-] equivalent	0.0000004	0.000204	2.0E-08
Aroclor-1254	0.0158	8.26	2.0E-08
Benzo(a)anthracene	0.0474	23.4	2.0E-08
		Total Excess Cancer Risk	**6E-08**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420).

Table H-4.2-12
Industrial Screening for Noncarcinogens for AOC 39-002(c)

COPC	EPC[a] (mg/kg)	Industrial SSL[b] (mg/kg)	HQs
Antimony	1.14(U)[c]	454	0.003
Copper	20.6	45400	0.0005
Cyanide	0.899	22700	0.00004
Mercury	0.138	310[d]	0.0004
Zinc	112	341000	0.0003
Toluene	0.00145	57900	0.00000003
Cadmium	0.966	1120	0.0009
		HI	**0.005**

[a] Maximum detected concentration.

[b] SSLs from NMED (2009, 106420).

[c] Antimony was not detected but had detection limits above background.

[d] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table H-4.2-13
Residential Screening for Carcinogens for AOC 39-002(c)

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	Cancer Risk
TCDD[2,3,7,8-] equivalent	0.0000004	0.0000414	9.65E-08
Aroclor-1254	0.0158	2.2[c]	7.18E-08
Benzo(a)anthracene	0.0474	4.81	9.85E-08
		Total Excess Cancer Risk	**3E-07**

[a] Maximum detected concentration.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table H-4.2-14
Residential Screening for Noncarcinogens for AOC 39-002(c)

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	HQs
Antimony	1.19(U)[c]	31.3	0.04
Cadmium	0.966[d]	77.9	0.01
Copper	13.57	3130	0.004
Cyanide (total)	0.423	1560	0.0003
Mercury	0.0158	23[e]	0.0007
Zinc	63.31	23500	0.003
Toluene	0.00101	5570	0.0000002
Aroclor-1254	0.0158[d]	1.12	0.01
Xylene[1,3-]+Xylene[1,4-]	0.000608[d]	1090[f]	0.000001
		HI	**0.07**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420).

[c] Antimony was not detected but had detection limits above background.

[d] Maximum detected concentration.

[e] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[f] SSL for total xylenes used.

Table H-4.2-15
Industrial Screening for Carcinogens for AOC 39-002(f)

COPC	EPC[a] (mg/kg)	Industrial SSL[b] (mg/kg)	Cancer Risk
TCDD[2,3,7,8-] equivalent	0.0000000148	0.000204	1E-09
		Total Excess Cancer Risk	**1E-09**

[a] Maximum detected concentration.

[b] SSLs from NMED (2009, 106420).

Table H-4.2-16
Industrial Screening for Noncarcinogens for AOC 39-002(f)

COPC	EPC[a] (mg/kg)	Industrial SSL[b] (mg/kg)	HQs
Perchlorate	0.00642	795	0.000008
Antimony	1.11	454	0.0024
Copper	16.6	45400	0.0004
Toluene	0.000627	57900	0.00000001
		HI	**0.003**

[a] Maximum detected concentration.

[b] SSLs from NMED (2009, 106420).

Table H-4.2-17
Residential Screening for Carcinogens for AOC 39-002(f)

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	Cancer Risk
TCDD[2,3,7,8-] equivalent	0.0000000148	0.0000414	3.58E-09
Benzo(a)pyrene	0.029	0.481	6.03E-07
Benzo(b)fluoranthene	0.0462	4.81	9.60E-08
Chrysene	0.0287	481	5.97E-10
Indeno(1,2,3-cd)pyrene	0.0159	4.81	3.31E-08
		Total Excess Cancer Risk	**7E-07**

[a] Maximum detected concentration.

[b] SSLs from NMED (2009, 106420).

Table H-4.2-18
Residential Screening for Noncarcinogens for AOC 39-002(f)

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	HQs
Antimony	1.11[c]	31.3	0.04
Copper	9.507	3130	0.003
Perchlorate	0.00562	54.8	0.0001
Benzo(g,h,i)perylene	0.0175[c]	1720[d]	0.00001
Fluoranthene	0.058[c]	2290	0.00003
Phenanthrene	0.0397[c]	1830	0.00002
Pyrene	0.0595[c]	1720	0.00003
Toluene	0.000627[c]	5570	0.0000001
		HI	**0.04**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420).

[c] Maximum detected concentration.

[d] Pyrene SSL used as a surroigate base on structural similarity.

Table H-4.2-19
Industrial Screening for Carcinogens for SWMU 39-005

COPC	EPC[a] (mg/kg)	Industrial SSL[b] (mg/kg)	Cancer Risk
TCDD[2,3,7,8-] equivalent	0.00000018[c]	0.000204	8.87E-09
Benzo(a)anthracene	1.1	23.4	4.70E-07
Benzo(a)pyrene	0.99	2.34	4.23E-06
Benzo(b)fluoranthene	0.81	23.4	3.46E-07
Benzo(k)fluoranthene	1.1	234	4.70E-08
Chrysene	1.3	2340	5.56E-09
Methylene chloride	0.013	1090	1.19E-10
Naphthalene	0.28	252	1.11E-08
		Total Excess Cancer Risk	**5E-06**

[a] Maximum detected concentration.

[b] SSLs from NMED (2009, 106420).

[c] Maximum detected concentration.

Table H-4.2-20
Industrial Screening for Noncarcinogens for SWMU 39-005

COPC	EPC[a] (mg/kg)	Industrial SSL[b] (mg/kg)	HQs
Acenaphthene	0.24	36700	0.000007
Benzo(g,h,i)perylene	0.56	18300[c]	0.00003
Dibenzofuran	0.16	1620[d]	0.00009
Fluoranthene	2.6	24400	0.0001
Fluorene	0.24	24400	0.00001
Phenanthrene	2.2	20500	0.0001
Pyrene	3.1	18300	0.0002
Bromomethane	0.00058	83.6	0.000007
Methylnaphthalene[2-]	0.068	4100[e]	0.00002
Mercury	0.72	310[e]	0.002
Anthracene	0.34	183000	0.000002
Acetone	0.012	851000	0.00000001
Isopropyltoluene[4-]	0.028	14900[f]	0.000002
		HI	**0.003**

[a] Maximum detected concentration.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] Pyrene SSL used as a surrogate based on structural similarity.

[d] SSL from NMED (2006, 092513).

[e] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[f] Isopropylbenzene SSL used as a surrogate based on structural similarity.

Table H-4.2-21
Industrial Screening for Radionuclides for SWMU 39-005

COPC	EPC[a] (pCi/g)	Industrial SAL[b] (pCi/g)	Dose (mrem/yr)
Uranium-234	2.29	1500	0.02
Uranium-235/236	0.234	87	0.04
Uranium-238	2.27	430	0.08
Plutonium-238	0.038	240	0.002
Tritium	0.65	440000	0.00002
		Total Dose	**0.14**

[a] Maximum detected concentration.

[b] SALs from NMED (2005, 088493).

Table H-4.2-22
Residential Screening for Carcinogens for SWMU 39-005

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	Cancer Risk
TCDD[2,3,7,8-] equivalent	0.000000181[c]	0.0000414	4.02E-08
Arsenic	1.2(U)[d]	3.59	3.34E-06
Chromium	4.531	2800[e]	1.62E-08
Benzo(a)anthracene	0.244	4.81	5.07E-07
Benzo(a)pyrene	0.241	0.481	5.01E-06
Benzo(b)fluoranthene	0.228	4.81	4.74E-07
Benzo(k)fluoranthene	0.254	48.1	5.28E-08
Chrysene	0.282	481	5.86E-09
Indeno(1,2,3-cd)pyrene	0.191	4.81	3.97E-07
Methylene chloride	0.0057	199	2.86E-10
Aroclor-1254	0.34[c]	2.2[e]	1.55E-06
Naphthalene	0.28[c]	45.0	6.22E-08
RDX	0.0094[c]	35.6	2.64E-09
		Total Excess Cancer Risk	**1E-05**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] Maximum detected concentration.

[d] Arsenic was not detected but had detection limits above background.

[e] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table H-4.2-23
Residential Screening for Noncarcinogens for SWMU 39-005

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	HQs
Copper	6.826	3130	0.002
Nickel	3.012	1560	0.002
Benzo(g,h,i)perylene	0.181	1720[c]	0.0001
Fluoranthene	0.506	2290	0.0002
Phenanthrene	0.414	1830	0.0002
Pyrene	0.704	1720	0.0004
Mercury	0.72[d]	23[e]	0.03
Selenium	0.56(U)[f]	391	0.001
Acenaphthene	0.24[d]	3440	0.0001
Acetone	0.028[d]	67500	0.0000004
Amino-2,6-dinitrotoluene[4-]	0.014[d]	150[e]	0.0001
Amino-4,6-dinitrotoluene[2-]	0.018[d]	150[e]	0.0001
Anthracene	0.34[d]	17200	0.00002
Aroclor-1254	0.34[d]	1.12	0.3
Bromomethane	0.00058[d]	22.3	0.00003
Dibenzofuran	0.16[d]	142[g]	0.001
Fluorene	0.24[d]	2290	0.0001
Hexanone[2-]	0.026[d]	31800[h]	0.000001
Isopropyltoluene[4-]	0.028[d]	271[i]	0.0001
Methylnaphthalene[2-]	0.068[d]	310[e]	0.02
Trinitrobenzene[1,3,5-]	0.01[d]	2200[e]	0.000005
Trinitrotoluene[2,4,6-]	0.01[d]	35.9	0.0003
		HI	**0.4**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] Pyrene SSL used as surrogate based on structural similarity.

[d] Selenium was not detected but had a detection limit above background.

[e] Maximum detected concentration.

[f] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[g] SSL from NMED (2006, 092513).

[h] Butanone[2-] SSL used as surrogate based on structural similarity.

[i] Isopropylbenzene SSL used as surrogate based on structural similarity.

Table H-4.2-24
Residential Screening for Radionuclides for SWMU 39-005

COPC	EPC[a] (pCi/g)	Residential SAL[b] (pCi/g)	Dose (mrem/yr)
Plutonium-238	0.042[c]	37	0.017
Tritium	0.65[c]	750	0.013
Uranium-234	1.902	170	0.17
Uranium-235/236	0.123	17	0.11
Uranium-238	3.24	86	0.56
		Total Dose	**0.86**

[a] UCL used unless otherwise noted.

[b] SALs from LANL (2005, 088493).

[c] Maximum detected concentration.

Table H-4.2-25
Industrial Screening for Carcinogens for SWMU 39-006(a) Active Components

COPC	EPC[a] (mg/kg)	Industrial SSL[b] (mg/kg)	Cancer Risk
TCDD[2,3,7,8-]	0.000000111	0.000204	5.44E-09
Bis(2-ethylhexyl)phthalate	0.11	1370	8.03E-10
		Total Excess Cancer Risk	**6E-09**

[a] Maximum detected concentration.

[b] SSLs from NMED (2009, 106420).

Table H-4.2-26
Industrial Screening for Noncarcinogens for SWMU 39-006(a) Active Components

COPC	EPC[a] (mg/kg)	Industrial SSL[b] (mg/kg)	HQs
Mercury	0.669	310	0.0022
		HI	**0.002**

[a] Maximum detected concentration.

[b] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table H-4.2-27
Residential Screening for Carcinogens for SWMU 39-006(a) Active Components

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	Cancer Risk
TCDD[2,3,7,8-] equivalent	0.000000111[c]	0.0000414	2.46E-08
Bis(2-ethylhexyl)phthalate	0.11[c]	280	3.93E-09
		Total Excess Cancer Risk	**3E-08**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420).

[c] Maximum detected concentration.

Table H-4.2-28
Residential Screening for Noncarcinogens for SWMU 39-006(a) Active Components

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	HQs
Mercury	0.669	23	0.03
Amino-2,6-dinitrotoluene[4-]	0.0059	150	0.00004
		HI	**0.03**

[a] UCL used unless otherwise noted.

[b] SSLs from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table H-4.2-29
Industrial Screening for Carcinogens for SWMU 39-007(a)

COPC	EPC[a] (mg/kg)	Industrial SSL[b] (mg/kg)	Cancer Risk
Aroclor-1248	0.35[c]	8.26	4.24E-07
Benzo(k)fluoranthene	0.042[c]	234	1.79E-09
Butylbenzylphthalate	0.077[c]	9100[d]	8.46E-11
Chrysene	0.04[c]	2340	1.71E-10
Dichlorobenzene[1,4-]	0.00074[c]	180	4.11E-11
Ethylbenzene	0.00043[c]	385	1.12E-11
Aroclor-1254	22.12	8.26	2.68E-05
Aroclor-1260	6.754	8.26	8.18E-06
Bis(2-ethylhexyl)phthalate	0.264	1370	1.93E-09
		Total Excess Cancer Risk	**4E-05**

[a] Maximum detected concentration.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] Maximum detected concentration.

[d] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table H-4.2-30
Industrial Screening for Noncarcinogens for SWMU 39-007(a)

COPC	EPC[a] (mg/kg)	Industrial SSL[b] (mg/kg)	HQs
Cyanide (total)	0.15[c]	22700	0.000007
Fluoranthene	0.076[c]	24400	0.000003
Phenanthrene	0.067[c]	20500	0.000003
Pyrene	0.08[c]	18300	0.000004
Toluene	0.00095[c]	57900	0.00000002
Antimony	0.529	454	0.001
Cadmium	0.591	1120	0.0005
		HI	**0.002**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420).

[c] Maximum detected concentration.

Table H-4.2-31
Residential Screening for Carcinogens for SWMU 39-007(a)

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	Cancer Risk
Aroclor-1242	0.24	1.7	1.41E-06
Aroclor-1248	0.35	1.7	2.06E-06
Aroclor-1254	2.598	2.2[c]	1.18E-05
Aroclor-1260	3.122	1.7	1.84E-05
Bis(2-ethylhexyl)phthalate	0.193	280	6.89E-09
Benzo(k)fluoranthene	0.042[d]	48.1	8.73E-09
Butylbenzylphthalate	0.077[d]	2600[c]	2.96E-10
Chrysene	0.04[d]	481	8.32E-10
Dichlorobenzene[1,4-]	0.00074[d]	32.1	2.31E-10
Ethylbenzene	0.00043[d]	69.6	6.18E-11
		Total Excess Cancer Risk	**3E-05**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[d] Maximum detected concentration.

Table H-4.2-32
Residential Screening for Noncarcinogens for SWMU 39-007(a)

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	HQs
Acetone	0.0346[c]	67500	0.0000005
Antimony	0.749[c]	31.3	0.02
Aroclor-1254	2.598	1.12	2.3
Cyanide (total)	0.16[c]	1560	0.0001
Fluoranthene	0.076[c]	2290	0.00003
Isopropylbenzene	0.000467[c]	3210	0.0000002
Isopropyltoluene[4-]	0.00117[c]	3210[d]	0.00004
Perchlorate	0.000585[c]	54.8	0.00001
Phenanthrene	0.067[c]	1830	0.00004
Pyrene	0.08[c]	1720	0.00005
Toluene	0.00095[c]	5570	0.0000002
Cadmium	0.223	77.9	0.003
		HI	**2.3**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420).

[c] Maximum detected concentration.

[d] Isopropylbenzene SSL used as a surrogate based on structural similarity.

Table H-4.2-33
Industrial Screening for Carcinogens for AOC 39-007(d)

COPC	EPC[a] (mg/kg)	Industrial SSL[b] (mg/kg)	Cancer Risk
Aroclor-1242	0.66[c]	8.26	7.99E-07
Aroclor-1254	0.382[c]	8.26	4.62E-07
Benzo(a)pyrene	0.0149[c]	2.34	6.37E-08
Bis(2-ethylhexyl)phthalate	0.35[c]	1370	2.55E-09
Methylene chloride	0.00342	1090	3.14E-11
TCDD[2,3,7,8-] equivalent	0.000000103	0.000204	5.06E-09
		Total Excess Cancer Risk	**1E-06**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 092513).

[c] Maximum detected concentration.

Table H-4.2-34
Industrial Screening for Noncarcinogens for AOC 39-007(d)

COPC	EPC[a] (mg/kg)	Industrial SSL[b] (mg/kg)	HQs
Antimony	1.14(U)[c]	454	0.003
Cyanide (total)	0.57(U)[d]	22700	0.00003
Acetone	0.01	851000	0.00000001
Cadmium	0.47[e]	1120	0.0004
Isopropyltoluene[4-]	0.142[e]	14900[f]	0.00001
Methylnaphthalene[2-]	6.35[e]	4100[g]	0.002
Phenanthrene	5.73[e]	20500	0.0003
Pyrene	1.51[e]	18300	0.00008
Toluene	0.00138[e]	57900	0.00000002
Trichlorofluoromethane	0.00094[e]	6760	0.0000001
Trimethylbenzene[1,2,4-]	0.203[e]	280[g]	0.0007
Trimethylbenzene[1,3,5-]	0.256[e]	200[g]	0.001
Zinc	39.59	341000	0.0001
		HI	**0.007**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] Antimony was not detected but had detection limits above background.

[d] Cyanide was not detected but had detection limits above background.

[e] Maximum detected concentration.

[f] Pyrene SSLK used as a surrogate based on structural similarity.

[g] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table H-4.2-35
Industrial Screening for Radionuclides for AOC 39-007(d)

COPC	EPC[a] (pCi/g)	Industrial SAL[b] (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	0.151	210	0.01
Tritium	0.0089	440000	0.0000003
		Total Dose	**0.01**

[a] Maximum detected concentration.

[b] SALs from NMED (2005, 088493).

Table H-4.2-36
Residential Screening for Carcinogens for AOC 39-007(d)

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	Cancer Risk
TCDD[2,3,7,8-] equivalent	0.0000000745	0.0000414	1.80E-08
Aroclor-1242	0.66[c]	1.7	3.88E-06
Aroclor-1254	0.382[c]	2.2[d]	1.74E-06
Benzo(a)pyrene	0.0149[c]	0.481	3.10E-07
Bis(2-ethylhexyl)phthalate	0.53[c]	280	1.89E-08
Methylene chloride	0.00337	199	1.69E-10
		Total Excess Cancer Risk	**6E-06**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] Maximum detected concentration.

[d] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table H-4.2-37
Residential Screening for Noncarcinogens for AOC 39-007(d)

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	HQs
Antimony	1.2(U)[c]	31.3	0.04
Cyanide (total)	0.98(U)[d]	1560	0.0006
Cadmium	0.47[e]	77.9	0.006
Zinc	38.2	23500	0.002
Perchlorate	0.0048[e]	54.8	0.00009
Acetone	0.0507[e]	67500	0.000001
Anthracene	0.183[e]	17200	0.00001
Aroclor-1254	0.382[e]	1.12	0.3
Bromomethane	0.00067[e]	22.3	0.00003
Diphenylamine	1.85[e]	1500[f]	0.001
Fluorene	0.265[e]	2290	0.0001
Isopropyltoluene[4-]	0.142[e]	3210[g]	0.00004
Methylnaphthalene[2-]	6.35[e]	310[f]	0.02
Phenanthrene	5.73[e]	1830	0.003
Pyrene	1.51[e]	1720	0.001
Toluene	0.00138[e]	5570	0.0000002
Trichlorofluoromethane	0.0013[e]	2010	0.0000006
Trimethylbenzene[1,2,4-]	0.203[e]	67[f]	0.004
Trimethylbenzene[1,3,5-]	0.256[e]	47[f]	0.01
		HI	**0.4**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] Antimony was not detected but had detection limits above background.

[d] Cyanide was not detected but had detection limits above background.

[e] Maximum detected concentration.

[f] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[g] Isopropylbenzene SSL used as surrogate based on structural similarity.

Table H-4.2-38
Residential Screening for Radionuclides for AOC 39-007(d)

COPC	EPC[a] (pCi/g)	Residential SAL[b] (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	0.151	33	0.07
Tritium	0.42	750	0.008
		Total Dose	**0.08**

[a] Maximum detected concentration.

[b] SALs from LANL (2005, 088493).

Table H-4.2-39
Industrial Screening for Carcinogens for SWMU 39-010

COPC	EPC[a] (mg/kg)	Industrial SSL[b] (mg/kg)	Cancer Risk
TCDD[2,3,7,8-] equivalent	0.00000236	0.000204	1.16E-07
Aroclor-1254	0.0015	8.26	1.82E-09
Aroclor-1260	0.0049	8.26	5.93E-09
Benzo(a)anthracene	0.094	23.4	4.02E-08
Benzo(a)pyrene	0.12	2.34	5.13E-07
Benzo(b)fluoranthene	0.097	23.4	4.15E-08
Benzo(k)fluoranthene	0.1	234	4.27E-09
Chloromethane	0.00053	198	2.68E-11
Chrysene	0.12	2340	5.13E-10
Indeno(1,2,3-cd)pyrene	0.065	23.4	2.78E-08
		Total Excess Cancer Risk	**7E-07**

[a] Maximum detected concentration.

[b] SSLs from NMED (2009, 106420).

Table H-4.2-40
Industrial Screening for Noncarcinogens for SWMU 39-010

COPC	EPC[a] (mg/kg)	Industrial SSL[b] (mg/kg)	HQs
Cadmium	0.58(U)[c]	77.9	0.007
Copper	695.7	45400	0.02
Lead	23.65	800	0.03
Mercury	0.493	310[d]	0.002
Antimony	1.19[e]	454	0.003
Perchlorate	0.00486[e]	795	0.000006
Amino-2,6-dinitrotoluene[4-]	0.0064[e]	2000[d]	0.000003
Amino-4,6-dinitrotoluene[2-]	0.0099[e]	1900[d]	0.000005
Benzo(g,h,i)perylene	0.072[e]	18300[f]	0.000004
Di-n-butylphthalate	2.76[e]	68400	0.00004
Fluoranthene	0.19[e]	24400	0.000008
HMX	0.036[e]	34200	0.000001
Phenanthrene	0.064[e]	20500	0.000003
Pyrene	0.18[e]	18300	0.00001
Trinitrotoluene[2,4,6-]	0.033[e]	469	0.00007
		HI	**0.06**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] Cadmium was not detected from 0-1 ft but had detection limits above background.

[d] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[e] Maximum detected concentration.

[f] Pyrene SSL used as a surrogate based on structural similarity.

Table H-4.2-41
Industrial Screening for Radionuclides for SWMU 39-010

COPC	EPC[a] (pCi/g)	Industrial SAL[b] (pCi/g)	Dose (mrem/yr)
Cesium-137	0.225	5.6	0.6
Uranium-234	3.653	1500	0.002
Uranium-235/236	0.372	87	0.06
Uranium-238	17.28	430	0.6
Tritium	0.037[c]	440000	0.000001
		Total Dose	**1.3**

[a] UCL used unless otherwise noted.

[b] SALs from LANL (2005, 088493).

[c] Maximum detected concentration.

Table H-4.2-42
Residential Screening for Carcinogens for SWMU 39-010

COPC	EPC[a,b] (mg/kg)	Residential SSL[c,d] (mg/kg)	Cancer Risk
TCDD[2,3,7,8-] equivalent	0.00000236	0.0000414	5.70E-07
Arsenic	0.949	3.59	2.64E-06
Aroclor-1254	0.0147[b]	2.2[d]	6.68E-08
Aroclor-1260	0.0041[b]	1.7	2.41E-08
Benzo(a)anthracene	0.094[b]	4.81	1.95E-07
Benzo(a)pyrene	0.12[b]	0.481	2.49E-06
Benzo(b)fluoranthene	0.097[b]	4.81	2.02E-07
Benzo(k)fluoranthene	0.1[b]	48.1	2.08E-08
Bis(2-ethylhexyl)phthalate	0.84[b]	280	3.00E-08
Chloromethane	0.00053[b]	35.6	1.49E-10
Chromium	6.623	2800[d]	2.23E-08
Chrysene	0.12[b]	481	2.49E-09
Butylbenzylphthalate	0.24[b]	2600[d]	9.23E-10
Indeno(1,2,3-cd)pyrene	0.065[b]	4.81	1.35E-07
RDX	25.3[b]	35.6	7.11E-06
		Total Excess Cancer Risk	**1E-05**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[d] Maximum detected concentration.

Table H-4.2-43
Residential Screening for Noncarcinogens for SWMU 39-010

COPC	EPC[a,b] (mg/kg)	Residential SSL[c] (mg/kg)	HQs
Aluminum	2972	78100	0.04
Barium	52.68	15600	0.003
Cadmium	0.0987	77.9	0.001
Copper	443.2	3130	0.1
Iron	6410	54800	0.1
Lead	24.3	400	0.06
Manganese	228.1	10700	0.02
Mercury	0.51	23[d]	0.02
Nickel	3.366	1560	0.002
Vanadium	7.336	391	0.02
Zinc	36.88	23500	0.002
Di-n-butylphthalate	0.628	6110	0.0001
Antimony	1.19[b]	31.3	0.04
Perchlorate	0.00486[b]	54.8	0.00009
Amino-2,6-dinitrotoluene[4-]	0.016[b]	150[d]	0.0001
Amino-4,6-dinitrotoluene[2-]	0.0099[b]	150[d]	0.00007
Aroclor-1254	0.0147[b]	1.12	0.01
Benzo(g,h,i)perylene	0.072[b]	1720[e]	0.00004
Fluoranthene	0.19[b]	2290	0.00008
Hexanone[2-]	0.0038[b]	31800[f]	0.0000001
HMX	2.6[b]	3060	0.0008
Phenanthrene	0.064[b]	1830	0.00003
Pyrene	0.18[b]	1720	0.0001
Trimethylbenzene[1,3,5-]	0.0005[b]	47[d]	0.00002
Trinitrotoluene[2,4,6-]	0.293[b]	35.9	0.008
		HI	**0.4**

[a] UCL used unless otherwise noted.

[b] Maximum detected concentration.

[c] SSLs from NMED (2009, 106420) unless otherwise noted.

[d] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[e] Pyrene SSL used as a surrogate based on structural similarity.

[f] Butanone[2-] SSL used as a surrogate based on structural similarity.

Table H-4.2-44
Residential Screening for Radionuclides for SWMU 39-010

COPC	EPC[a] (pCi/g)	Residential SAL[b] (pCi/g)	Dose (mrem/yr)
Uranium-234	4.606	170	0.41
Uranium-235/236	0.874	17	0.77
Uranium-238	24.42	86	4.25
Cesium-137	0.205[a]	5.6	0.55
Tritium	3.91[a]	750	0.08
		Total Dose	**6.1**

[a] Maximum detected concentration.

[b] SALs from NMED 2005, 088493.

Table H-4.2-45
Recreational Screening for Carcinogens for the Extended Drainages

COPC	EPC[a] (mg/kg)	Recreational SSL[b] (mg/kg)	Cancer Risk
TCDD[2,3,7,8-] equivalent	0.0000000333	0.000277	1.20E-09
Aroclor-1242	0.0096	10.5	9.14E-09
Aroclor-1254	0.0398	10.5	3.79E-08
Aroclor-1260	0.0779	10.5	7.42E-08
Arsenic	0.953	27.7	3.44E-07
Benzo(a)anthracene	0.16	30.1	5.32E-08
Benzo(a)pyrene	0.18	3.0	5.98E-07
Benzo(b)fluoranthene	0.13	30.1	4.32E-08
Benzo(k)fluoranthene	0.18	301	5.98E-09
Bis(2-ethylhexyl)phthalate	0.72	1830	3.93E-09
Chloromethane	0.00064	510	1.25E-11
Chrysene	0.00064	3010	2.13E-12
Dibenz(a,h)anthracene	0.036	3	1.20E-07
Dichlorobenzene[1,4-]	0.00072	2360	3.05E-12
Indeno(1,2,3-cd)pyrene	0.083	30.1	2.76E-08
Methylene chloride	0.012	3300	3.64E-11
Nitrotoluene[4-]	0.23	2140	1.07E-09
RDX	0.32	233	3.09E-11
		Total Excess Cancer Risk	**1E-06**

[a] Maximum detected concentration.

[b] SSLs from LANL 2007, 094496.

Table H-4.2-46
Recreational Screening for Noncarcinogens for the Extended Drainages

COPC	EPC[a] (mg/kg)	Recreational SSL[b] (mg/kg)	HQs
Antimony	5.68(U)[c]	317	0.02
Cadmium	0.0959	392	0.0002
Copper	71.72	31700	0.002
Cyanide (total)	0.164	7970	0.00002
Lead	10.29	560	0.02
Mercury	1.518	238	0.01
Zinc	36.05	238000	0.0002
Perchlorate	0.02[d]	79.2	0.0003
Selenium	0.21[d]	3960	0.0001
Acenaphthene	0.037[d]	47500	0.000001
Acetone	0.042[d]	477000	0.0000001
Anthracene	0.052[d]	238000	0.0000002
Aroclor-1242	0.0096[d]	15.8	0.001
Aroclor-1254	0.0398[d]	6.65	0.01
Aroclor-1260	0.0779[d]	15.8	0.005
Benzo(g,h,i)perylene	0.094[d]	23800[e]	0.000004
Bromomethane	0.00045[d]	228	0.000002
Butylbenzylphthalate	0.14[d]	79700	0.000002
Di-n-butylphthalate	0.17[d]	39900	0.000004
Dichlorobenzene[1,2-]	0.00065[d]	2610	0.0000002
Dinitrotoluene[2,4-]	0.0037[d]	797	0.000005
Fluoranthene	0.37[d]	13900	0.00003
HMX	0.96[d]	19900	0.00005
Phenanthrene	0.23[d]	12000	0.00002
Pyrene	0.36[d]	23800	0.00002
Styrene	0.00037[d]	64300	0.00000001
Toluene	0.0041[d]	54100	0.0000001
Trichlorofluoromethane	0.0014[d]	17300	0.0000001
Trimethylbenzene[1,2,4-]	0.00074[d]	39600	0.00000002
Trinitrotoluene[2,4,6-]	0.0056[d]	199	0.00003
		HI	**0.07**

[a] UCL used unless otherwise noted.

[b] SSLs from LANL 2007, 094496.

[c] Antimony was not detected but had detection limits above background.

[d] Maximum detected concentration.

[e] Pyrene SSL used as surrogate based on structural similarity.

Table H-4.2-47
Recreational Screening for Radionuclides for the Extended Drainages

COPC	EPC[a] (pCi/g)	Recreational SAL[b] (pCi/g)	Dose (mrem/yr)
Uranium-234	2.246	3200	0.01
Uranium-235/236	0.195	520	0.006
Uranium-238	10.65	2100	0.08
Tritium	0.65[c]	750	0.013
		Total Dose	**0.11**

[a] UCL used unless otherwise noted.

[b] SALs from LANL (2005, 088493).

[c] Maximum detected concentration.

Table H-4.2-48
Residential Screening for Carcinogens for the Extended Drainages

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	Cancer Risk
TCDD[2,3,7,8-] equivalent	0.0000000333[c]	0.0000414	8.04E-09
Aroclor-1242	0.0096[c]	1.7	5.65E-08
Aroclor-1254	0.0398[c]	2.2[d]	1.81E-07
Aroclor-1260	0.0779[c]	1.7	4.58E-07
Arsenic	0.953[c]	3.59	2.65E-06
Benzo(a)anthracene	0.16[c]	4.81	3.33E-07
Benzo(a)pyrene	0.18[c]	0.481	3.74E-06
Benzo(b)fluoranthene	0.13[c]	4.81	2.70E-07
Benzo(k)fluoranthene	0.18[c]	48.1	3.74E-08
Bis(2-ethylhexyl)phthalate	0.72[c]	280	2.57E-08
Butylbenzylphthalate	0.14[c]	2600[d]	5.38E-10
Chloromethane	0.00064[c]	35.6	1.80E-10
Chrysene	0.00064[c]	481	1.33E-11
Dibenz(a,h)anthracene	0.036[c]	0.481	7.48E-07
Dichlorobenzene[1,4-]	0.00072[c]	32.1	2.24E-10
Dinitrotoluene[2,4-]	0.0037[c]	12.6	2.94E-09
Indeno(1,2,3-cd)pyrene	0.083[c]	4.81	1.73E-07
Methylene chloride	0.012[c]	199	6.03E-10
Nitrotoluene[4-]	0.23	300[d]	7.67E-09
RDX	0.32[c]	36	2.02E-10
		Total Excess Cancer Risk	**9E-06**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] Maximum detected concentration.

[d] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table H-4.2-49
Residential Screening for Noncarcinogens for the Extended Drainages

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	HQs
Antimony	5.68(U)[c]	31.3	0.2
Cadmium	0.0959	77.9	0.001
Copper	71.72	3130	0.02
Cyanide (total)	0.164	1560	0.0001
HMX	0.96[d]	3060	0.0003
Lead	10.29	400	0.03
Mercury	1.518	23[e]	0.07
Zinc	36.05	23500	0.002
Perchlorate	0.02[d]	54.8	0.0004
Selenium	0.21[d]	391	0.0005
Acenaphthene	0.037[d]	3440	0.00001
Acetone	0.042[d]	67500	0.0000006
Anthracene	0.052[d]	17200	0.000003
Aroclor-1254	0.0398[d]	1.12	0.04
Benzo(g,h,i)perylene	0.094[d]	1720[f]	0.00006
Bromomethane	0.00045[d]	22.3	0.00002
Di-n-butylphthalate	0.17[d]	6110	0.00003
Dichlorobenzene[1,2-]	0.00065[d]	3010	0.0000002
Fluoranthene	0.37[d]	2290	0.0002
Isopropyltoluene[4-]	0.0091	3210[g]	0.000003
Nitrotoluene[4-]	0.23[d]	244	0.0009
Phenanthrene	0.23[d]	1830	0.0001
Pyrene	0.36[d]	1720	0.0002
Styrene	0.00037[d]	8970	0.00000004
Toluene	0.0041[d]	5570	0.0000007
Trichlorofluoromethane	0.0014[d]	2010	0.0000007
Trimethylbenzene[1,2,4-]	0.00074[d]	67[e]	0.00001
Trinitrotoluene[2,4,6-]	0.0056[d]	35.9	0.0002
		HI	**0.4**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] Antimony was not detected but had detection limits above background.

[d] Maximum detected concentration.

[e] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[f] Pyrene SSL used as surrogate based on structural similarity.

[g] Isopropylbenzene SSL used as a surrogate based on structural similarity.

Table H-4.2-50
Residential Screening for Radionuclides for the Extended Drainages

COPC	EPC[a] (pCi/g)	Residential SAL[b] (pCi/g)	Dose (mrem/yr)
Uranium-234	2.246	170	0.2
Uranium-235/236	0.195	17	0.2
Uranium-238	10.65	86	1.9
Tritium	0.65[c]	750	0.01
		Total Dose	**2.3**

[a] UCL used unless otherwise noted.

[b] SALs from LANL (2005, 088493).

[c] Maximum detected concentration.

Table H-4.2-51
Residential Screening for Carcinogens for SWMU 39-001(b)

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	Cancer Risk
TCDD[2,3,7,8-] equivalent	2.45E-09	0.000045	5.44E-10
Aroclor-1254	0.046[c]	2.2[d]	2.09E-07
Benzo(a)anthracene	0.079[c]	4.81	1.64E-07
Benzo(a)pyrene	0.083[c]	0.481	1.73E-06
Benzo(b)fluoranthene	0.066[c]	4.81	1.37E-07
Benzo(k)fluoranthene	0.067[c]	48.1	1.39E-08
Bis(2-ethylhexyl)phthalate	0.12[c]	280	4.29E-09
Chrysene	0.088[c]	481	1.83E-09
Indeno(1,2,3-cd)pyrene	0.052[c]	4.81	1.08E-07
RDX	0.12[c]	35.6	3.37E-08
		Total Excess Cancer Risk	**2E-06**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] Maximum detected concentration.

[d] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table H-4.2-52
Residential Screening for Noncarcinogens for SWMU 39-001(b)

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	HQs
Lead	8.65	400	0.02
Mercury	2.014	23[c]	0.09
Vanadium	18.28	391	0.05
Zinc	27.27	23500	0.001
Cyanide (total)	0.13[d]	1560	0.00008
Acenaphthene	0.31[d]	3440	0.00009
Aroclor-1254	0.046[d]	1.12	0.04
Benzo(g,h,i)perylene	0.06[d]	1720[e]	0.00003
Fluoranthene	0.2[d]	2290	0.00009
HMX	0.046[d]	3060	0.00002
Phenanthrene	0.13[d]	1830	0.00007
Pyrene	0.17[d]	1720	0.0001
Toluene	0.00037[d]	5570	0.0000001
Trimethylbenzene[1,2,4-]	0.00052[d]	67[c]	0.00001
		HI	**0.2**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[d] Maximum detected concentration.

[e] Pyrene SSL used as surrogate based on structural similarity.

Table H-4.2-53
Residential Screening for Radionuclides for SWMU 39-001(b)

COPC	EPC[a] (pCi/g)	Residential SAL[b] (pCi/g)	Dose (mrem/yr)
Tritium	2.18	750	0.044
		Total Dose	**0.04**

[a] Maximum detected concentration.

[b] SALs from LANL (2005, 088493).

Table H-4.2-54
Residential Screening for Carcinogens for SWMU 39-006(a) Inactive Components

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	Cancer Risk
Aroclor-1254	0.023	2.2[c]	1.05E-07
Benzene	0.0088[d]	15.5	5.68E-09
Bis(2-ethylhexyl)phthalate	0.509	280	1.82E-08
TCDD[2,3,7,8-] equivalent	0.0000000195	0.000041	4.71E-09
		Total Excess Cancer Risk	**2E-07**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[d] Maximum detected concentration.

Table H-4.2-55
Residential Screening for Noncarcinogens for SWMU 39-006(a) Inactive Components

COPC	EPC[a] (mg/kg)	Residential SSL[b] (mg/kg)	HQs
Aroclor-1254	0.023	1.12	0.02
Acetone	0.011[c]	67500	0.0000002
Cadmium	1.919	77.9	0.02
Cyanide (total)	7.129	1560	0.00
Di-n-butylphthalate	0.039[c]	6110	0.00
Isopropyltoluene[4-]	0.00059[c]	3210[d]	0.00
Nitrate	22.3	125000	0.0002
Perchlorate	0.00324[c]	54.8	0.0001
Phenol	0.49[c]	18300	0.00003
Silver	87.88	391	0.22
Toluene	0.00048[c]	5570	0.0000001
Trimethylbenzene[1,2,4-]	0.00056[c]	67[e]	0.00001
		HI	**0.3**

[a] UCL used unless otherwise noted.

[b] SSLs from NMED (2009, 106420) unless otherwise noted.

[c] Maximum detected concentration.

[d] Isopropylbenzene SSL used as a surrogate based on structural similarity.

[e] SSL from EPA regional screening table (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table H-4.2-56
Residential Screening for Radionuclides for SWMU 39-006(a) inactive components

COPC	EPC[a] (pCi/g)	Residential SAL[b] (pCi/g)	Dose (mrem/yr)
Cesium-137	0.308	5.6	0.83
Tritium	2.02	750	0.04
		Total Dose	**0.87**

[a] Maximum detected concentration.

[b] SALs from LANL (2005, 088493).

Table H-4.3-1
Comparison of VOC Concentrations to EPA Region 6 Indoor Worker Values

COPCs	Maximum Concentration (mg/kg)	Indoor Worker SSL[a] (mg/kg)
Acetone	0.051	56000
Benzene	0.0088	15
Bromomethane	0.00067	13
Chloromethane	0.00064	27
Dichlorobenzene[1,2-]	0.00065	410
Dichlorobenzene[1,4-]	0.00074	75
Ethylbenzene	0.00072	6000
Hexanone[2-]	0.026	130000[b]
Iodomethane	0.0009	na[c]
Isopropylbenzene	0.00047	520
Isopropyltoluene[4-]	0.142	520[d]
Methylene chloride	0.014	210
Stryene	0.00037	20000
Toluene	0.023	22000
Trichloroethene	0.00084	0.92
Trimethylbenzene[1,2,4-]	0.2	170
Trmethylbenzene[1,3,5-]	0.26	70
Trichlorofluoromethane	0.0014	1300
Xylene[1,2-]	0.00062	5200
1,3-Xylene + 1,4-Xylene	0.0018	640[e]

[a] SSLs from EPA 2007, 099314.

[b] Butanone[2-] SSL used as a surrogate based on structural similarity.

[c] na = Not available.

[d] Isopropylbenzene SSL used as a surrogate basedon structural similarity.

[e] Xylene (total) SSL used.

Table H-5.3-1
Ecological Screening Levels for Terrestrial Receptors

COPCs	American Kestrel (avian intermediate carnivore)	American Kestrel (avian top carnivore)	American Robin (avian herbivore)	American Robin (avian insectivore)	American Robin (avian omnivore)	Deer Mouse (mammalian omnivore)	Desert Cottontail (mammalian herbivore)	Earthworm (soil-dwelling invertebrate)	Plant (terrestrial autotroph - producer)	Montane Shrew (mammalian insectivore)	Red Fox (mammalian top carnivore)
Inorganic Chemicals											
Antimony	na*	na	na	na	na	0.48	2.9	78	0.05	0.26	45
Arsenic	160	1100	42	18	26	32	160	6.8	18	15	810
Barium	11000	37000	820	1000	930	1800	3300	330	110	1300	41000
Beryllium	na	na	na	na	na	56	170	40	2.5	18	420
Cadmium	2	580	4.4	0.29	0.54	0.51	9.9	140	32	0.27	510
Chromium	7700	37000	1900	830	1100	1900	13000	2.3	2.4	750	30000
Cobalt	930	3500	170	96	120	400	1800	na	13	160	5400
Copper	88	1200	28	11	16	59	250	13	10	34	3500
Cyanide (total)	0.61	1.4	0.1	0.1	0.1	340	740	na	na	310	5200
Iron	na	na	na	na	na	na	na	na	na	na	na
Lead	120	810	21	14	16	120	370	1700	120	72	3700
Manganese	110000	290000	4600	10000	6400	1200	1700	na	50	1300	35000
Mercury	0.082	0.28	0.07	0.013	0.022	3	22	0.05	34	1.7	46
Nickel	530	9500	530	70	120	530	12000	100	20	250	31000
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	8.5	140	1.5	1.1	1.3	1.1	3	7.7	0.1	0.92	110
Silver	52	2200	30	7.2	11	77	490	na	0.05	44	13000
Thallium	6.6	75	9.2	0.9	1.6	0.068	2.8	na	0.1	0.032	2.8
Uranium	21000	39000	1900	1600	1700	750	2000	na	25	220	4800

Table H-5.3-1 (continued)

COPCs	American Kestrel (avian intermediate carnivore)	American Kestrel (avian top carnivore)	American Robin (avian herbivore)	American Robin (avian insectivore)	American Robin (avian omnivore)	Deer Mouse (mammalian omnivore)	Desert Cottontail (mammalian herbivore)	Earthworm (soil-dwelling invertebrate)	Plant (terrestrial autotroph - producer)	Montane Shrew (mammalian insectivore)	Red Fox (mammalian top carnivore)
Vanadium	84	170	8.9	6.7	7.6	480	1500	na	0.025	140	3300
Zinc	180	1400	200	27	48	290	3000	190	10	160	10000
Semivolatile Organic Compounds											
Acenaphthene	na	na	na	na	na	na	160	490	0.25	120	6200
Acenaphthylene	na	na	na	na	na	160	500	na	na	120	5200
Anthracene	na	na	na	na	na	310	1100	na	na	210	5800
Benzo(a)anthracene	na	na	na	na	na	3.4	6.2	na	18	3	45
Benzo(a)pyrene	na	na	na	na	na	15	50	na	na	9.6	68
Benzo(b)fluoranthene	na	na	na	na	na	52	130	na	18	38	250
Benzo(g,h,i)perylene	na	na	na	na	na	47	540	na	na	24	94
Benzo(k)fluoranthene	na	na	na	na	na	100	350	na	na	62	400
Benzoic acid	na	na	na	na	na	1.3	4.2	na	na	1	350
Bis(2-ethylhexyl)phthalate	0.045	0.033	20	0.02	0.04	1.1	2700	na	na	0.59	1.2
Butylbenzylphthalate	na	na	na	na	na	160	2300	na	na	90	1900
Chrysene	na	na	na	na	na	3.1	6.5	na	na	2.4	46
Dibenz(a,h)anthracene	na	na	na	na	na	22	95	na	na	12	54
Dibenzofuran	na	na	na	na	na	na	na	na	6.1	na	na
Di-n-butylphthalate	0.068	0.24	0.39	0.011	0.021	370	16000	na	160	180	5000
Di-n-octylphthalate	na	na	na	na	na	2.2	16000	na	na	1.1	16
Fluoranthene	na	na	na	na	na	38	260	38	na	22	360
Fluorene	na	na	na	na	na	340	1100	4.1	na	250	9300
Indeno(1,2,3-cd)pyrene	na	na	na	na	na	110	590	na	na	62	270
Methylnaphthalene[2-]	na	na	na	na	na	3.8	16	na	na	2.5	130

Table H-5.3-1 (continued)

COPCs	American Kestrel (avian intermediate carnivore)	American Kestrel (avian top carnivore)	American Robin (avian herbivore)	American Robin (avian insectivore)	American Robin (avian omnivore)	Deer Mouse (mammalian omnivore)	Desert Cottontail (mammalian herbivore)	Earthworm (soil-dwelling invertebrate)	Plant (terrestrial autotroph - producer)	Montane Shrew (mammalian insectivore)	Red Fox (mammalian top carnivore)
Naphthalene	1100	6300	37	170	61	0.34	0.45	na	1	0.96	42
Phenanthrene	na	na	na	na	na	15	59	34	na	10	290
Pyrene	na	na	na	na	na	32	110	18	na	22	360
Volatile Organic Compounds											
Acetone	1200	30000	7.5	170	14	1.2	1.4	na	na	15	2900
Ethylbenzene	na	na	na	na	na	na	na	na	na	na	na
Isopropylbenzene	na	na	na	na	na	na	na	na	na	na	na
Isopropyltoluene[4-]	na	na	na	na	na	na	na	na	na	na	na
Methylene chloride	na	na	na	na	na	2.6	3.4	na	1600	9	1700
Toluene	na	na	na	na	na	25	61	na	200	23	3100
Trichloroethene	na	na	na	na	na	55	170	na	na	42	6400
Trichlorofluoromethane	na	na	na	na	na	na	na	na	na	na	na
Trimethylbenzene[1,2,4-]	na	na	na	na	na	na	na	na	na	na	na
Trimethylbenzene[1,3,5-]	na	na	na	na	na	na	na	na	na	na	na
Xylene[1,2-]	na	na	na	na	na	na	na	na	na	na	na
Xylene (total)	280	3200	90	41	56	2.0	7.0	na	100	1.4	130
High Explosives											
Amino-2,6-dinitrotoluene[4-]	na	na	na	na	na	0.73	1	na	80	1.5	330
Amino-4,6-dinitrotoluene[2-]	na	na	na	na	na	2.1	2.8	na	80	5.4	760
Dinitroaniline[3,5-]	na	na	na	na	na	na	na	na	na	na	na
Dinitrotoluene[2,4-]	na	na	na	na	na	0.52	0.62	na	na	2.7	150
HMX	na	na	na	na	na	27	29	140	2700	3100	29000
PETN	na	na	na	na	na	8600	9900	na	na	73000	640000

Table H-5.3-1 (continued)

COPCs	American Kestrel (avian intermediate carnivore)	American Kestrel (avian top carnivore)	American Robin (avian herbivore)	American Robin (avian insectivore)	American Robin (avian omnivore)	Deer Mouse (mammalian omnivore)	Desert Cottontail (mammalian herbivore)	Earthworm (soil-dwelling invertebrate)	Plant (terrestrial autotroph - producer)	Montane Shrew (mammalian insectivore)	Red Fox (mammalian top carnivore)
RDX	200	1100	12	22	16	130	210	7.5	100	150	6900
TATB	na	na	na	na	na	na	na	na	na	na	na
Tetryl	na	na	na	na	na	0.99	1.1	na	25	35	370
Trinitrotoluene[2,4,6-]	1400	2700	6.4	na	na	na	na	na	na	na	na
PCBs and Dioxin/Furan											
Aroclor-1242	0.26	1.4	1	0.041	0.079	0.76	30	na	na	0.38	16
Aroclor-1248	0.2	0.34	1	0.041	0.079	0.014	0.59	na	na	0.0072	0.075
Aroclor-1254	0.17	0.22	1.3	0.041	0.08	0.88	52	na	160	0.44	0.15
Aroclor-1260	3.7	4.6	46	0.88	1.7	20	3000	na	na	10	0.14
TCDD[2,3,7,8-]	na	na	na	na	na	0.00000058	0.000048	5	na	0.00000029	0.0000012
Radionuclides											
Uranium-234	120000	190000	48000	14000	14000	91000	96000	51	14000	94000	45000
Uranium-235	10000	10000	9000	6400	6400	5100	5100	55	4000	5100	4800
Uranium-238	4100	4200	3900	3400	3400	2100	2100	55	1800	2100	2000
Cesium-137	3700	2900	4200	3800	3700	2400	2300	1700	2300	2400	680
Plutonium-239/240	34000	160000	8600	2100	2100	150000	170000	47.0	160000	110000	33000
Tritium	630000	580000	300000	600000	440000	330000	230000	48000	36000	340000	190000

Note: Units are mg/kg, except for radionuclides, which are pCi/g.
*na = Not available.

Table H-5.3-2
Ecological Screening for SWMU 39-002(a) Area 1

COPC	EPC (mg/kg)	Final ESL	Receptor	HQ
Cadmium	0.625	0.27	Montane shrew	**2.3**
Copper	62.22	15	American robin	**4.1**
Lead	52.62	14	American robin	**3.8**
Mercury	0.646	0.013	American robin	**50**
Silver	0.327	2.6	American robin	0.1
Zinc	88.09	48	American robin	**1.8**
Acenaphthene	0.347	0.25	Plant	**1.4**
Anthracene	0.557	6.8	Plant	0.08
Aroclor-1254	0.116	0.041	American robin	**2.8**
Benzo(a)anthracene	1.725	3	Montane shrew	**0.6**
Benzo(a)pyrene	1.983	53	Montane shrew	0.04
Benzo(b)fluoranthene	1.99	18	Plant	0.1
Benzo(g,h,i)perylene	1.158	24	Montane shrew	0.05
Benzo(k)fluoranthene	1.117	62	Montane shrew	0.02
Bis(2-ethylhexyl)phthalate	0.216	0.02	American robin	**11**
Chrysene	2.002	2.4	Montane shrew	**0.8**
Di-n-butylphthalate	0.564	0.011	American robin	**51**
Fluoranthene	5.162	10	Earthworm	**0.5**
Fluorene	0.376	3.7	Earthworm	0.1
Indeno(1,2,3-cd)pyrene	1.093	62	Montane shrew	0.02
Methylnaphthalene[2-]	0.104	2.5	Montane shrew	0.04
Naphthalene	0.247	1	Plant	0.2
Phenanthrene	4.134	5.5	Earthworm	**0.8**
Pyrene	4.342	10	Earthworm	**0.4**

Table H-5.3-2 (continued)

COPC	EPC (mg/kg)	Final ESL	Receptor	HQ
Uranium-238	2.384	55	Earthworm	0.04
Antimony	2.46	0.05	Plant	**49**
Cyanide (total)	20.8	0.1	American robin	**208**
Thallium	1.26	0.032	Montane shrew	**39**
Acenaphthylene	0.201	120	Montane shrew	0.001
Amino-2,6-dinitrotoluene[4-]	0.171	0.73	Deer mouse	0.2
Aroclor-1260	0.155	0.14	Red fox	**1.1**
Dibenz(a,h)anthracene	0.5	12	Montane shrew	0.04
Dibenzofuran	1.1	6.1	Plant	0.2
Methylene chloride	0.00345	2.6	Deer mouse	0.001
Tetryl	0.345	0.99	Deer mouse	**0.3**
Toluene	0.0233	23	Montane shrew	0.001
Trichloroethene	0.00084	42	Montane shrew	0.00002
Trinitrotoluene[2,4,6-]	1.02	6.4	American robin	0.2
Xylene[1,2-]	0.000624	1.4	Montane shrew	0.0004
Xylene[1,3-]+Xylene[1,4-]	0.00177	1.4	Montane shrew	0.001
Plutonium-239/240	0.105	47	Earthworm	0.002
Tritium	8.21	36000	Plant	0.0002
TCDD[2,3,7,8-] equivalent	0.000000348	0.00000029	Montane shrew	**1.2**

Note: Bolded values indicate HQs greater than 0.3.

Table H-5.3-3
HQ/HI Analysis for SWMU 39-002(a) Area 1

COPEC	EPC (mg/kg)	American Kestrel(intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Cadmium	0.625	**0.3**	0.001	0.1	**2.2**	**1.2**	**1.2**	0.06	0.004	0.02	**2.3**	0.001
Copper	62.22	**0.6**	0.04	**1.6**	**4.1**	**2.8**	**1.0**	0.2	**0.8**	**0.9**	**1.6**	0.02
Lead	52.62	**0.4**	0.06	**2.5**	**3.8**	**3.3**	**0.4**	0.1	0.03	**0.4**	**0.7**	0.01
Mercury (inorganic)	0.646	**7.9**	**2.3**	**9.2**	**50**	**29**	0.2	0.03	**13**	0.02	**0.38**	0.01
Zinc	88.09	0.3	0.04	0.3	**1.8**	**1.0**	**0.5**	0.05	**0.7**	**0.6**	**0.9**	0.01
Acenaphthene	0.347	na*	na	na	na	na	0.002	0.0007	na	**1.4**	0.003	0.00006
Aroclor-1254	0.116	**0.7**	**0.5**	0.09	**2.8**	**1.5**	0.1	0.002	na	0.0007	0.3	**0.8**
Benzo(a)anthracene	1.725	na	na	na	na	na	**0.5**	0.3	na	0.10	**0.6**	0.05
Bis(2-ethylhexyl)phthalate	0.216	**4.8**	**6.5**	0.01	**10.8**	**5.4**	0.2	0.00008	na	na	**0.4**	0.18
Chrysene	2.002	na	na	na	na	na	**0.6**	**0.3**	na	na	**0.8**	0.08
Di-n-butylphthalate	0.564	**8.3**	**2.4**	**1.4**	**51**	**27**	0.002	0.00004	na	0.004	0.003	0.0001
Fluoranthene	5.162	na	na	na	na	na	0.1	0.02	**0.5**	na	0.2	0.01
Phenanthrene	4.134	na	na	na	na	na	0.3	0.07	**0.8**	na	**0.4**	0.01
Pyrene	4.342	na	na	na	na	na	0.1	0.04	**0.4**	na	0.2	0.01
Antimony	2.46	na	na	na	na	na	**5.1**	**0.8**	0.032	**49**	**9**	0.05
Cyanide (total)	20.8	**44**	**36**	**208**	**208**	**208**	0.06	0.03	na	na	0.07	0.01
Thallium	1.26	0.2	0.02	0.1	**1.4**	**0.8**	**19**	**0.45**	na	**13**	**39**	**0.45**
Aroclor-1260	0.155	0.04	0.03	0.003	0.2	0.09	0.008	0.00005	na	na	0.02	**1.1**

Table H-5.3-3 (continued)

COPEC	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Tetryl	0.345	na	na	na	na	na	**0.3**	**0.3**	na	0.01	0.01	0.0009
TCDD[2,3,7,8-] equivalent	0.000000348	na	na	na	na	na	**0.6**	0.0	0.00000007	na	**1.2**	0.29
HI		**68**	**48**	**223**	**336**	**280**	**30**	**2.9**	**16**	**65**	**58**	**2.8**

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.0.

*na = Not available.

Table H-5.3-4
Ecological Screening for SWMU 39-002(a) Area 3

COPC	EPC (mg/kg)	Final ESL	Receptor	HQ
Antimony	0.94(U)	0.05	Plant	**19**
Copper	31.44	15	American robin	**2.1**
Cyanide (total)	0.193	0.1	American robin	**1.9**
Aroclor-1254	0.013	0.041	American robin	**0.32**
Acetone	0.013	1.2	Deer mouse	0.01
Anthracene	0.053	6.8	Plant	0.008
Aroclor-1260	0.0091	0.14	Red fox	0.07
Benzo(a)anthracene	0.128	3	Montane shrew	0.04
Benzo(a)pyrene	0.129	53	Montane shrew	0.002
Benzo(b)fluoranthene	0.116	18	Plant	0.006
Benzo(g,h,i)perylene	0.0779	24	Montane shrew	0.003
Benzo(k)fluoranthene	0.137	62	Montane shrew	0.002
Bis(2-ethylhexyl)phthalate	0.267	0.02	American robin	**13**
Chrysene	0.136	2.4	Montane shrew	0.06
Di-n-butylphthalate	0.54	0.011	American robin	**49**
Fluoranthene	0.185	10	Earthworm	0.02
Indeno(1,2,3-cd)pyrene	0.079	62	Montane shrew	0.001
Methylene chloride	0.00214	2.6	Deer mouse	0.0008
PETN	0.00000344	8600	Deer mouse	0.0000000004
Phenanthrene	0.165	5.5	Earthworm	0.03
Pyrene	0.183	10	Earthworm	0.02
TCDD[2,3,7,8-] equivalent	0.00000113	0.00000029	Montane shrew	**3.9**

Note: Bolded values indicate HQs greater than 0.3.

Table H-5.3-5
HQ/HI Analysis for AOC 39-002(a) Area 3

COPEC	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Antimony	0.94(U)	na*	na	na	na	na	**2**	**0.32**	0.01	**19**	**4**	0.02
Copper	31.44	0.3	0.02	**0.8**	**2.1**	**1.4**	**0.5**	0.1	**0.4**	**0.4**	**0.8**	0.008
Cyanide (total)	0.193	**0.4**	**0.3**	**1.9**	**1.9**	**1.9**	0.0006	0.0003	na	na	0.0006	0.00009
Aroclor-1254	0.013	0.08	0.06	0.01	**0.3**	0.2	0.01	0.00025	na	0.00008	0.03	0.09
Bis(2-ethylhexyl)phthalate	0.267	**5.9**	**8.1**	0.01	**13**	**6.7**	0.2	0.0001	na	na	**0.5**	0.2
Di-n-butylphthalate	0.54	**7.9**	**2.3**	**1.4**	**49**	**26**	0.001	0.00003	na	0.003375	0.003	0.0001
TCDD[2,3,7,8-] equivalent	1.126E-06	na	na	na	na	na	**1.9**	0.02	0.0000002	na	**3.9**	**0.9**
HI		**15**	**11**	**4**	**67**	**36**	**5**	0.4	0.4	**19**	**9**	1

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.0.
*na = Not available.

Table H-5.3-6
Ecological Screening for AOC 39-002(c)

COPC	EPC (mg/kg)	Final ESL	Receptor	HQ
Antimony	1.19(U)	0.05	Plant	**24**
Cadmium	0.966	0.27	Montane shrew	**4**
Copper	13.57	15	American robin	**0.90**
Cyanide (total)	0.423	0.1	American robin	**4.2**
Mercury	0.0158	0.013	American robin	**1.2**
Zinc	63.31	48	American robin	**1.3**
Toluene	0.00101	23	Montane shrew	0.00004
Aroclor-1254	0.0158	0.041	American robin	**0.38**
Benzo(a)anthracene	0.0474	3	Montane shrew	0.016
Xylene[1,3-]+Xylene[1,4-]	0.000608	1.4	Montane shrew	0.0005
TCDD[2,3,7,8-] equivalent	0.0000004	0.00000029	Montane shrew	**1.4**

Note: Bolded values indicate HQs greater than 0.3.

Table H-5.3-7
HQ/HI Analysis for AOC 39-002(c)

COPEC	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Antimony	1.19(U)	na*	na	na	na	na	**2.5**	**0.4**	0.02	**24**	**4.6**	0.03
Cadmium	0.966	0.5	0.002	0.2	**3.3**	**1.8**	**1.9**	0.1	0.007	0.03	**3.6**	0.002
Copper	13.57	0.1	0.008	**0.4**	**0.9**	**0.6**	0.2	0.05	0.2	0.2	**0.4**	0.004
Cyanide (total)	0.423	**0.9**	**0.7**	**4.2**	**4.2**	**4.2**	0.001	0.0006	na	na	0.001	0.0002
Mercury (inorganic)	0.07	1.0	0.28	**1.1**	**6.1**	**3.6**	0.026	0.0036	**1.58**	0.0023	0.047	0.0017
Zinc	63.31	0.2	0.03	0.2	**1.3**	**0.7**	**0.4**	0.04	**0.5**	**0.4**	**0.6**	0.01
Aroclor-1254	0.0158	0.09	0.07	0.01	**0.4**	0.2	0.02	0.0003	na	0.0001	0.04	0.1
TCDD[2,3,7,8-] equivalent	0.0000004	na	na	na	na	na	**0.7**	0.008	8E-08	na	**1.4**	**0.3**
HI		**3**	1	**6**	**16**	**11**	**6**	0.6	**2**	**25**	**11**	0.4

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.0.
*na = Not available.

Table H-5.3-8
Ecological Screening for AOC 39-002(f)

COPC	EPC (mg/kg)	Final ESL	Receptor	HQ
Antimony	1.11	0.05	Plant	**22.2**
Copper	9.51	15	American robin	**0.63**
Benzo(a)pyrene	0.029	53	Montane shrew	0.0005
Benzo(b)fluoranthene	0.0462	18	Generic plant	0.003
Benzo(g,h,i)perylene	0.0175	24	Montane shrew	0.0007
Chrysene	0.0287	2.4	Montane shrew	0.01
Fluoranthene	0.058	10	Earthworm	0.006
Indeno(1,2,3-cd)pyrene	0.0159	62	Montane shrew	0.0003
Phenanthrene	0.0397	5.5	Earthworm	0.007
Pyrene	0.0595	10	Earthworm	0.006
Toluene	0.000627	23	Montane shrew	0.00003
TCDD[2,3,7,8-] equivalent	0.0000000148	0.00000029	Montane shrew	0.05

Note: Bolded values indicate HQs greater than 0.3.

Table H-5.3-9
HQ/HI Analysis for AOC 39-002(f)

COPEC	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Antimony	1.11	na*	na	na	na	na	**2.3**	**0.4**	0.01	**22**	**4.3**	0.02
Copper	9.51	0.09	0.006	0.3	**0.6**	**0.4**	0.1	0.04	0.1	0.1	0.3	0.003
HI		0.09	0.01	0.3	0.6	0.4	**3**	0.4	0.1	**22**	**5**	0.03

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.0.
*na = Not available.

Table H-5.3-10
Ecological Screening for SWMU 39-005

COPC	EPC (mg/kg)	Final ESL	Receptor	HQ
Acenaphthene	0.24	0.25	Plant	**0.96**
Acetone	0.028	1.2	Deer mouse	0.02
Amino-2,6-dinitrotoluene[4-]	0.014	0.73	Deer mouse	0.02
Amino-4,6-dinitrotoluene[2-]	0.018	2.1	Deer mouse	0.009
Anthracene	0.34	6.8	Plant	0.05
Arsenic	1.1(U)	6.8	Earthworm	0.2
Chromium	4.531	2.3	Earthworm	**2.0**
Copper	6.826	15	American robin	**0.45**
Nickel	3.012	9.7	Montane shrew	**0.31**
Selenium	0.56(U)	0.52	Plant	**1.7**
Cyanide (total)	0.58(U)	0.1	American robin	**5.8**
Benzo(a)anthracene	0.244	3	Montane shrew	0.08
Benzo(a)pyrene	0.241	53	Montane shrew	0.005
Benzo(b)fluoranthene	0.228	18	Pant	0.01
Benzo(g,h,i)perylene	0.181	24	Montane shrew	0.008
Benzo(k)fluoranthene	0.254	62	Montane shrew	0.004
Chrysene	0.282	2.4	Montane shrew	0.1
Dibenzofuran	0.16	6.1	Plant	0.03
Fluoranthene	0.495	10	Earthworm	0.05
Fluorene	0.24	3.7	Earthworm	0.06
Indeno(1,2,3-cd)pyrene	0.191	62	Montane shrew	0.003
Methylene chloride	0.0057	2.6	Deer mouse	0.002
Methylnaphthalene[2-]	0.068	2.5	Montane shrew	0.03
Mercury	0.72	0.013	American robin	**55**
Naphthalene	0.28	1	Plant	0.28
Phenanthrene	0.411	5.5	Earthworm	0.07
Plutonium-238	0.042	44	Earthworm	0.0009
Pyrene	0.704	10	Earthworm	0.07
RDX	0.0094	7.5	Earthworm	0.001
Trinitrobenzene[1,3,5-]	0.01	6.6	Deer mouse	0.001
Trinitrotoluene[2,4,6-]	0.01	6.4	American robin	0.001
Tritium	0.65	36000	Plant	0.00002
Uranium-234	1.902	51	Earthworm	0.04
Uranium-235/236	0.123	54	Earthworm	0.003
Uranium-238	1.94	55	Earthworm	0.04
TCDD[2,3,7,8-] equivalent	0.000000181	0.00000029	Montane shrew	**0.6**

Note: Bolded values indicate HQs greater than 0.3.

Table H-5.3-11
HQ/HI Analysis for SWMU 39-005

COPEC	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Acenaphthene	0.24	na*	na	na	na	na	0.002	0.0005	na	**0.96**	0.002	0..00004
Chromium	4.531	0.001	0.0001	0.002	0.005	0.004	0.002	0.0003	**2.0**	**1.9**	0.006	0.0002
Copper	6.826	0.1	0.004	0.2	**0.5**	**0.3**	0.1	0.025	0.09	0.10	0.18	0.002
Nickel	3.012	0.02	0.001	0.02	0.1	0.08	0.2	0.0060	0.01	0.08	**0.31**	0.003
Selenium	0.56(U)	0.1	0.004	**0.4**	**0.6**	**0.5**	**0.5**	0.2	0.10	**0.8**	**0.6**	0.005
Cyanide (total)	0.58(U)	**1.1**	**0.9**	**5**	**5**	**5**	0.001	0.0007	na	na	0.002	0.0002
Mercury (inorganic)	0.72	**8.8**	**2.6**	**10**	**55**	**33**	0.24	0.03	**14**	0.02	**0.4**	0.02
TCDD[2,3,7,8-] equivalent	0.000000181	na	na	na	na	na	**0.3**	0.004	0.000000036	na	**0.6**	0.2
HI		**10**	**4**	**16**	**61**	**39**	1	0.3	**16**	**5**	**2**	0.2

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.0.
*na = Not available.

Table H-5.3-12
Ecological Screening for SWMU 39-006(a) Active Components

COPC	EPC (mg/kg)	Final ESL	Receptor	HQ
Mercury (inorganic)	0.669	0.013	American robin	**51**
Amino-2,6-dinitrotoluene[4-]	0.0059	0.73	Deer mouse	0.01
Bis(2-ethylhexyl)phthalate	0.11	0.02	American robin	**5.5**
TCDD[2,3,7,8-] equivalent	0.000000111	0.00000029	Montane shrew	**0.38**

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.0.

Table H-5.3-13
HQ/HI Analysis for SWMU 39-006(a) Active Components

COPEC	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Mercury (inorganic)	0.669	**8.2**	**2.4**	**9.6**	**51**	**30**	0.2	0.03	**13**	0.02	**0.4**	0.01
Bis(2-ethylhexyl)phthalate	0.11	**2.4**	**3.3**	0.0055	**5.5**	**2.75**	0.1	0.00004	na*	na	0.2	0.09
TCDD[2,3,7,8-] equivalent	0.000000111	na	na	na	na	na	0.2	0.002	0.00000002	na	**0.4**	0.09
HI		**11**	**6**	**10**	**57**	**33**	1	0.03	**13**	0.02	1	0.11

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.0.
*na = Not available.

Table H-5.3-14
Ecological Screening for SWMU 39-007(a)

COPC	EPC (mg/kg)	Final ESL	Receptor	HQ
Cadmium	0.153	0.27	Montane shrew	**0.6**
Aroclor-1254	2.598	0.041	American robin	**63**
Aroclor-1260	3.122	0.14	Red fox	**22**
Bis(2-ethylhexyl)phthalate	0.193	0.02	American robin	**9.7**
Cyanide (total)	0.16	0.1	American robin	**1.6**
Antimony	0.749	0.05	Plant	**15**
Acetone	0.0346	1.2	Deer mouse	0.03
Aroclor-1242	0.24	0.041	American robin	**5.9**
Aroclor-1248	0.35	0.0072	Montane shrew	**49**
Benzo(k)fluoranthene	0.042	62	Montane shrew	0.0007
Butybenzylphthalate	0.077	90	Montane shrew	0.0009
Chrysene	0.04	2.4	Montane shrew	0.02
Dichlorobenzene[1,4-]	0.00074	0.88	Montane shrew	0.0008
Fluoranthene	0.076	10	Earthworm	0.008
Phenanthrene	0.067	5.5	Earthworm	0.01
Pyrene	0.08	10	Earthworm	0.008
Toluene	0.00095	23	Montane shrew	0.00004

Note: Bolded values indicate HQs greater than 0.3.

Table H-5.3-15
HQ/HI Analysis for SWMU 39-007(a)

COPEC	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Cadmium	0.153	0.08	0.0003	0.03	**0.53**	0.28	0.30	0.02	0.001	0.005	**0.57**	0.0003
Aroclor-1254	2.598	**15**	**12**	**2.0**	**63**	**32**	**3.0**	0.05	na*	0.02	**5.9**	**17**
Aroclor-1260	3.122	**0.84**	**0.68**	0.07	**3.5**	**1.8**	0.16	0.001	na	na	**0.31**	**22**
Bis(2-ethylhexyl)phthalate	0.193	**4.3**	**5.8**	0.01	**9.7**	**4.8**	0.18	0.0001	na	na	**0.33**	0.16
Cyanide (total)	0.16	**0.34**	0.28	**1.6**	**1.6**	**1.6**	0.0005	0.0002	na	na	0.0005	0.0001
Antimony	0.749	na	na	na	na	na	**1.6**	0.26	0.01	**15**	**2.9**	0.02
Aroclor-1242	0.24	**0.9**	0.2	0.2	**5.9**	**3.0**	**0.3**	0.01	na	na	**0.63**	0.02
Aroclor-1248	0.35	**1.8**	**1.0**	**0.35**	**8.5**	**4.4**	**25**	**0.6**	na	na	**49**	**4.7**
HI		**24**	**20**	**4**	**93**	**48**	**31**	**1.0**	0.01	**15**	**60**	**44**

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.0.

*na = Not available.

Table H-5.3-16
Ecological Screening for AOC 39-007(d)

COPC	EPC (mg/kg)	Final ESL	Receptor	HQ
Antimony	1.2(U)	0.05	Plant	**24**
Cyanide (total)	0.98(U)	0.1	American robin	**9.8**
Cadmium	0.47	0.27	Montane shrew	**1.7**
Zinc	38.2	48	American robin	**0.79**
TCDD[2,3,7,8-] equivalent	0.0000000745	0.00000029	Montane shrew	0.25
Acetone	0.0507	1.2	Deer mouse	0.04
Anthracene	0.183	6.8	Plant	0.03
Aroclor-1242	0.66	0.041	American robin	**16**
Aroclor-1254	0.382	0.041	American robin	**9.3**
Benzo(a)pyrene	0.0149	53	Montane shrew	0.0003
Bis(2-ethylhexyl)phthalate	0.53	0.02	American robin	**26**
Fluorene	0.265	3.7	Earthworm	0.07
Methylene chloride	0.00337	2.6	Deer mouse	0.001
Methylnaphthalene[2-]	6.35	2.5	Montane shrew	**2.5**
Phenanthrene	5.73	5.5	Earthworm	**1.0**
Pyrene	1.51	10	Earthworm	0.2
Toluene	0.00138	23	Montane shrew	0.00006
Plutonium-239/240	0.151	47	Earthworm	0.003
Tritium	0.42	36000	Plant	0.00001

Note: Bolded values indicate HQs greater than 0.3.

Table H-5.3-17
HQ/HI Analysis for AOC 39-007(d)

COPEC	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Antimony	1.2(U)	na*	na	na	na	na	**2.5**	**0.4**	0.02	**24**	**4.6**	0.03
Cyanide (total)	0.98(U)	**2.1**	**1.7**	**9.8**	**9.8**	**9.8**	0.003	0.001	na	na	0.003	0.0004
Cadmium	0.47	0.2	0.0008	0.1	**1.6**	**0.9**	**0.9**	0.05	0.003	0.01	**1.7**	0.0009
Zinc	38.2	0.1	0.02	0.1	**0.8**	**0.4**	0.2	0.02	**0.3**	0.2	**0.4**	0.006
Aroclor-1242	0.66	**2.5**	**0.5**	**0.7**	**16**	**8.4**	**0.9**	0.02	na	na	**1.7**	0.04
Aroclor-1254	0.382	**2.2**	**1.7**	0.3	**9.3**	**4.8**	**0.4**	0.007	na	0.002	**0.9**	**2.5**
Bis(2-ethylhexyl)phthalate	0.53	**12**	**16**	0.03	**27**	**13**	**0.5**	0.0002	na	na	**0.9**	**0.4**
Methylnaphthalene[2-]	6.35	na	na	na	na	na	**1.7**	**0.4**	na	na	**2.5**	0.05
Phenanthrene	5.73	na	na	na	na	na	**0.4**	0.10	**1.0**	na	**0.6**	0.02
HI		**19**	**20**	**11**	**65**	**38**	**5**	0.6	1	0.3	**9**	**3**

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.0.
*na = Not available.

Table H-5.3-18
Ecological Screening for SWMU 39-010

COPC	EPC (mg/kg)	Final ESL	Receptor	HQ
Copper	443.2	15	American robin	**29.5**
Lead	24.3	14	American robin	**1.7**
Arsenic	0.949	6.8	Earthworm	0.1
Chromium	6.623	2.3	Earthworm	**2.0**
Barium	52.68	110	Plant	**0.5**
Cadmium	0.0987	0.27	Montane shrew	**4.7**
Mercury	0.51	0.013	American robin	**39**
Manganese	228.1	220	Plant	**1.0**
Nickel	3.37	9.7	Montane shrew	**0.35**
Vanadium	7.34	0.025	Plant	**294**
Zinc	36.88	48	American robin	**0.8**
Di-n-butylphthalate	0.628	0.011	American robin	**57**
Uranium-234	4.606	51	Earthworm	0.09
Uranium-235/236	0.874	54	Earthworm	0.02
Uranium-238	24.42	55	Earthworm	**0.4**
Antimony	1.19	0.05	Plant	**24**
Amino-2,6-dinitrotoluene[4-]	0.016	0.73	Deer mouse	0.02
Amino-4,6-dinitrotoluene[2-]	0.0099	2.1	Deer mouse	0.005
Aroclor-1254	0.0147	0.041	American robin	**0.4**
Aroclor-1260	0.0041	0.14	Red fox	0.03
Benzo(a)anthracene	0.094	3	Montane shrew	0.03
Benzo(a)pyrene	0.12	53	Montane shrew	0.002
Benzo(b)fluoranthene	0.097	18	Plant	0.005
Benzo(g,h,i)perylene	0.072	24	Montane shrew	0.003
Benzo(k)fluoranthene	0.1	62	Montane shrew	0.002

Table H-5.3-18 (continued)

COPC	EPC (mg/kg)	Final ESL	Receptor	HQ
Bis(2-ethylhexyl)phthalate	0.84	0.02	American robin	**42**
Chrysene	0.12	2.4	Montane shrew	0.05
Fluoranthene	0.19	10	Earthworm	0.02
Butylbenzylphthalate	0.24	90	Montane shrew	0.003
HMX	2.6	27	Deer mouse	0.1
Indeno(1,2,3-cd)pyrene	0.065	62	Montane shrew	0.001
Phenanthrene	0.064	5.5	Earthworm	0.01
Pyrene	0.18	10	Earthworm	0.02
RDX	25.3	7.5	Earthworm	**3.4**
Trinitrotoluene[2,4,6-]	0.293	6.4	American robin	0.05
Cesium-137	0.377	680	Red fox	0.0005
Tritium	3.91	36000	Plant	0.0001
TCDD[2,3,7,8-] equivalent	0.00000236	0.00000029	Montane shrew	**8.1**

Note: Bolded values indicate HQs greater than 0.3.

Table H-5.3-19
HQ/HI Analysis for AOC 39-010

COPEC	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Copper	443.2	**4.0**	0.3	**12**	**30**	**20**	**6.9**	**1.6**	**5.5**	**6.3**	**12**	0.1
Chromium	6.623	0.001	0.0002	0.003	0.008	0.006	0.003	0.0005	**2.9**	**2.8**	0.009	0.0002
Barium	52.68	0.0048	0.0014	0.064	0.053	0.057	0.029	0.016	0.1596	**0.5**	0.041	0.0013
Cadmium	0.0987	0.05	0.0002	0.022	**0.3**	0.2	0.2	0.01	0.0007	0.0031	**0.4**	0.0002
Lead	24.3	0.2	0.03	**1.2**	**1.7**	**1.5**	0.2	0.07	0.01	0.2	**0.3**	0.007
Mercury (inorganic)	0.51	**6.2**	**1.8**	**7.3**	**39**	**23**	0.2	0.02	**10.2**	0.02	0.3	0.01
Manganese	228.1	0.007	0.003	0.2	0.07	0.1	0.2	0.1	**0.5**	**1.0**	0.2	0.006
Nickel	3.37	0.02	0.001	0.02	0.2	0.09	0.2	0.007	0.01	0.009	**0.35**	0.003
Vanadium	7.34	0.09	0.04	**0.8**	**1.1**	**1.0**	0.02	0.005	na*	**294**	0.05	0.002
Zinc	36.88	0.1	0.02	0.1	**0.8**	**0.4**	0.2	0.02	**0.3**	0.2	**0.4**	0.006
Di-n-butylphthalate	0.628	**9.2**	**2.6**	**1.6**	**57**	**30**	0.002	0.00004	na	0.004	0.003	0.0001
Uranium-238	24.42	0.006	0.006	0.006	0.007	0.007	0.01	0.01	**0.4**	0.01	0.01	0.01
Antimony	1.19	na	na	na	na	na	**2.5**	**0.4**	0.015	**24**	**4.6**	0.03
Aroclor-1254	0.0147	0.09	0.07	0.01	**0.4**	0.2	0.02	0.0003	na	0.00009	0.03	0.10
Bis(2-ethylhexyl)phthalate	0.84	**19**	**25**	0.04	**42**	**21**	**0.8**	0.0003	na	na	**1.4**	**0.7**
RDX	25.3	0.1	0.02	**2.1**	**1.2**	**1.6**	0.2	0.1	**3.4**	0.3	0.2	0.004
TCDD[2,3,7,8-] equivalent	0.00000236	na	na	na	na	na	**4.1**	0.05	0.00000047	na	**8.1**	**2.0**
HI		**39**	**30**	**25**	**174**	**100**	**16**	**3**	**24**	**328**	**28**	**3**

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.0.
*na = Not available.

Table H-5.3-20
Ecological Screening for the Extended Drainages

COPC	EPC (mg/kg)	Final ESL	Receptor	HQ
Antimony	5.68(U)	0.05	Plant	**114**
Arsenic	0.953	6.8	Earthworm	0.1
Cadmium	0.0959	0.27	Montane shrew	**0.35**
Copper	71.72	15	American robin	**4.78**
Cyanide (total)	0.164	0.1	American robin	**1.64**
Lead	10.29	14	American robin	**0.74**
Mercury	1.518	0.013	American robin	**117**
Zinc	36.05	48	American robin	**0.75**
Uranium-234	2.246	51	Earthworm	0.04
Uranium-235/236	0.195	54	Earthworm	0.003
Uranium-238	10.65	55	Earthworm	0.19
Selenium	0.21	0.52	Plant	**0.40**
Acenaphthene	0.037	0.25	Plant	0.15
Acetone	0.042	1.2	Deer mouse	0.04
Anthracene	0.052	6.8	Plant	0.01
Aroclor-1242	0.0096	0.041	American robin	0.23
Aroclor-1254	0.0398	0.041	American robin	**0.97**
Aroclor-1260	0.0779	0.14	Red fox	**0.56**
Benzo(a)anthracene	0.16	3	Montane shrew	0.05
Benzo(a)pyrene	0.18	53	Montane shrew	0.00
Benzo(b)fluoranthene	0.13	18	Plant	0.01
Benzo(g,h,i)perylene	0.094	24	Montane shrew	0.004
Benzo(k)fluoranthene	0.18	62	Montane shrew	0.003
Bis(2-ethylhexyl)phthalate	0.72	0.02	American robin	**36**
Butylbenzylphthalate	0.14	90	Montane shrew	0.002
Chrysene	0.00064	2.4	Montane shrew	0.0003

Table H-5.3-20 (continued)

COPC	EPC (mg/kg)	Final ESL	Receptor	HQ
Di-n-butylphthalate	0.17	0.011	American robin	**15**
Dibenz(a,h)anthracene	0.036	12	Montane shrew	0.003
Dichlorobenzene[1,4-]	0.00072	0.88	Montane shrew	0.001
Dinitrotoluene[2,4-]	0.0037	0.52	Deer mouse	0.01
Fluoranthene	0.37	10	Earthworm	0.04
HMX	0.96	27	Deer mouse	0.04
Indeno(1,2,3-cd)pyrene	0.083	62	Montane shrew	0.001
Methylene chloride	0.012	2.6	Deer mouse	0.005
Nitrotoluene[4-]	0.23	4.4	Deer mouse	0.05
PETN	0.36	8600	Deer mouse	0.00004
Phenanthrene	0.23	5.5	Earthworm	0.04
Pyrene	0.36	10	Earthworm	0.036
RDX	0.32	7.5	Earthworm	0.04
Toluene	0.0041	23	Montane shrew	0.0002
Trinitrotoluene[2,4,6-]	0.0056	6.4	American robin	0.0009
TCDD[2,3,7,8-] equivalent	0.0000000333	0.00000029	Montane shrew	0.1
Tritium	0.65	36000	Plant	0.0002

Note: Bolded values indicate HQs greater than 0.3.

Table H-5.3-21
HQ/HI Analysis for the Extended Drainages

COPEC	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Antimony	5.68(U)	na*	na	na	na	na	**12**	**2**	0.07	**114**	**22**	0.1
Copper	71.72	**0.65**	0.04	**1.9**	**4.8**	**3.3**	**1.1**	0.27	**0.90**	**1.0**	**1.9**	0.019
Cadmium	0.0959	0.048	0.0002	0.022	**0.33**	0.18	0.2	0.0097	0.0007	0.003	**0.36**	0.0002
Cyanide (total)	0.164	**0.35**	0.28	**1.6**	**1.6**	**1.6**	0.0005	0.0002	na	na	0.0005	0.00007
Lead	10.29	0.09	0.01	**0.49**	**0.74**	**0.64**	0.09	0.03	0.006	0.09	0.14	0.003
Mercury (inorganic)	1.518	**19**	**5.4**	**22**	**117**	**69**	**0.51**	0.069	**30**	0.04	**0.89**	0.033
Zinc	36.05	0.11	0.02	0.10	**0.75**	**0.42**	0.21	0.02	**0.30**	0.23	**0.37**	0.006
Selenium	0.21	0.04	0.002	0.21	0.28	0.24	0.25	0.1	0.05	**0.40**	**0.32**	0.003
Aroclor-1254	0.0398	0.23	0.18	0.03	**0.97**	**0.50**	0.05	0.0008	na	0.0002	0.09	0.27
Aroclor-1260	0.0779	0.02	0.02	0.002	0.09	0.05	0.004	0.00003	na	na	0.008	**0.56**
Bis(2-ethylhexyl)phthalate	0.72	**16**	**22**	0.036	**36**	**18**	**0.65**	0.0003	na	na	**1.2**	**0.6**
Di-n-butylphthalate	0.17	**2.5**	**0.71**	**0.44**	**15**	**8**	0.0005	0.00001	na	0.001	0.0009	0.00003
HI		**39**	**29**	**27**	**178**	**102**	**15**	**3**	**31**	**116**	**27**	**2**

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.0.
*na = Not available.

Table H-5.3-22
Ecological Screening for SWMU 39-006(a) Inactive Components

COPC	EPC (mg/kg)	Final ESL	Receptor	HQ
Acetone	0.013	1.2	Deer mouse	0.01
Aroclor-1254	0.0188	0.041	American robin	**0.5**
Benzene	0.0088	24	Deer mouse	0.0004
Bis(2-ethylhexyl)phthalate	0.42	0.02	American robin	**21**
Cadmium	0.0942	0.27	Montane shrew	**0.35**
Cesium-137	0.308	680	Red fox	0.0005
Cyanide (total)	4.637	0.1	American robin	**46**
Di-n-butylphthalate	0.039	0.011	American robin	**3.5**
Phenol	0.49	0.79	Plant	**0.6**
Silver	1.128	2.6	American robin	**0.4**
Toluene	0.00048	23	Montane shrew	0.00002
Tritium	2.02	36000	Plant	0.00006
TCDD[2,3,7,8-] equivalent	0.0000000195	0.00000029	Montane shrew	0.07

Note: Bolded values indicate HQs greater than 0.3.

Table H-5.3-23
HQ/HI Analysis for SWMU 39-006(a) Inactive Components

COPEC	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (nsectivore)	Red Fox (carnivore)
Aroclor-1254	0.0188	0.1	0.09	0.01	**0.5**	0.2	0.02	0.0004	na*	0.0001	0.04	0.1
Bis(2-ethylhexyl)phthalate	0.42	**9.3**	**13**	0.02	**21**	**11**	**0.4**	0.0002	na	na	**0.7**	**0.4**
Cadmium	0.0942	0.05	0.0002	0.02	**0.32**	0.2	0.2	0.01	0.0007	0.003	0.35	0.0002
Cyanide (total)	4.637	**9.9**	**8.0**	**46**	**46**	**46**	0.01	0.0063	na	na	0.01	0.0021
Di-n-butylphthalate	0.039	**0.6**	0.2	0.1	**3.5**	**1.9**	0.0001	0.000002	na	0.0002	0.0002	0.000008
Phenol	0.49	na	na	na	na	na	0.01	0.01	0.27	**0.6**	0.0009	0.00003
Silver	1.128	0.06	0.001	0.1	**0.4**	0.3	0.05	0.008	na	0.002	0.08	0.0003
HI		**20**	**21**	**47**	**72**	**60**	0.7	0.03	0.3	0.6	1	0.5

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.0.
*na = Not available.

Table H-5.4-1
Comparison of EPCs to Background
Concentrations in Soil at SWMU 39-002(a) Area 1

COPEC	EPC (mg/kg)	Soil Background Concentrations (mg/kg)
Antimony	2.46	0.1–1
Cadmium	0.625	0.2–2.6
Copper	62.22	0.25–16
Cyanide (total)	20.8	0.5
Lead	52.62	2–28
Mercury	0.646	0.05–0.1
Thallium	1.26	0.063–1
Zinc	88.09	14–75.5

Table H-5.4-2
Comparison of EPCs to Background
Concentrations in Soil at SWMU 39-002(a) Area 3

COPEC	EPC (mg/kg)	Soil Background Concentrations (mg/kg)
Antimony	0.94(U)	0.1–1
Copper	31.44	0.25–16
Cyanide (total)	0.193	0.5

Table H-5.4-3
Comparison of EPCs to Background
Concentrations in Soil at AOC 39-002(c)

COPEC	EPC (mg/kg)	Soil Background Concentrations (mg/kg)
Antimony	1.19(U)	0.1–1
Cadmium	0.966	0.2–2.6
Copper	13.57	0.25–16
Cyanide (total)	0.423	0.5
Mercury	0.0792	0.05–0.1
Zinc	63.31	14–75.5

Table H-5.4-4
Comparison of EPCs to Background
Concentrations in Soil at AOC 39-002(f)

COPEC	EPC (mg/kg)	Soil Background Concentrations (mg/kg)
Antimony	1.11	0.1–1
Copper	9.507	0.25–16

Table H-5.4-5
Comparison of EPCs to Background
Concentrations in Soil and Tuff at SWMU 39-005

COPEC	EPC (mg/kg)	Soil Background Concentrations (mg/kg)	Tuff Background Concentrations (mg/kg)
Chromium	4.531	1.9–36.5	2.6
Copper	6.826	0.25–16	3.96
Nickel	3.012	1–29	1–2.8
Cyanide (total)	0.58(U)	0.5	0.5
Selenium	0.56(U)	0.1–1.7	0.3
Mercury	0.72	0.05–0.1	0.1

Table H-5.4-6
Comparison of EPCs to Background
Concentrations in Soil at SWMU 39-006(a) Active Components

COPEC	EPC (mg/kg)	Soil Background Concentrations (mg/kg)
Mercury	0.669	0.05–0.1

Table H-5.4-7
Comparison of EPCs to Background
Concentrations in Soil at SWMU 39-007(a)

COPEC	EPC (mg/kg)	Soil Background Concentrations (mg/kg)
Antimony	0.749	0.1–1
Cadmium	0.153	0.2–2.6
Cyanide (total)	0.16	0.5

Table H-5.4-8
Comparison of EPCs to Background
Concentrations in Soil at AOC 39-007(d)

COPEC	EPC (mg/kg)	Soil Background Concentrations (mg/kg)
Antimony	1.2(U)	0.1–1.0
Cyanide (total)	0.98(U)	0.5
Cadmium	0.47	0.2–2.6
Zinc	38.2	14–75.5

Table H-5.4-9
Comparison of EPCs to Background
Concentrations in Soil at SWMU 39-010

COPEC	EPC (mg/kg)	Soil Background Concentrations (mg/kg)
Antimony	1.19	0.1–1
Copper	443.2	0.25–16
Lead	24.3	2–28
Arsenic	0.949	0.3–9.3
Chromium	6.623	1.9–36.5
Barium	52.68	21–410
Cadmium	0.0987	0.2–2.6
Mercury	0.51	0.05–0.1
Manganese	228.1	76-1100
Nickel	3.37	1-29
Vanadium	7.34	4-56.5
Zinc	36.88	14–75.5

Table H-5.4-10
Comparison of EPCs to Background
Concentrations in Soil and Sediment in the Extended Drainages

COPEC	EPC (mg/kg)	Soil Background Concentrations (mg/kg)	Sediment Background Concentrations (mg/kg)
Antimony	5.68(U)	0.1–1	0.83
Cadmium	0.0959	0.2–2.6	0.05–0.18
Copper	71.72	0.25–16	0.77–12
Cyanide (total)	0.164	0.5	0.2–0.63
Lead	10.29	2–28	3.5–25.6
Mercury	1.518	0.51	0.02–0.03
Zinc	36.05	14–75.5	9–56.2

Table H-5.4-11
Comparison of EPCs to Background
Concentrations in Soil at SWMU 39-006(a) Inactive Components

COPEC	EPC (mg/kg)	Soil Background Concentrations (mg/kg)
Cadmium	0.094	0.2–2.6
Cyanide (total)	4.64	0.5
Silver	1.13	1.0

Table H-5.4-12
PAUFs for Receptors at North Ancho Canyon Aggregate Area Sites

SWMU/AOC/Site	Site Area (ha)	American Kestrel	Mexican Spotted Owl	American Robin	Deer Mouse	Desert Cottontail	Montane Shrew	Red Fox
Home Range (ha)		**106**	**366**	**0.42**	**0.077**	**3.1**	**0.39**	**1038**
Population Area (ha)		**4240**	**n/a***	**16.8**	**3**	**124**	**15.6**	**41520**
39-002(a) Area 1	0.009	0.000002	0.00002	0.0006	0.003	0.00007	0.0006	0.0000002
39-006(a) Inactive	0.027	0.00000	0.00007	0.002	0.009	0.0002	0.002	0.0000007
39-010	0.801	0.0002	0.002	0.05	0.3	0.006	0.05	0.00002
39-001(a)	0.094	0.00002	0.0003	0.006	0.03	0.0008	0.006	0.000002
39-001(b)	0.203	0.00005	0.0006	0.01	0.07	0.002	0.01	0.000005
39-002(a) Area 3	0.000090	0.00000002	0.0000002	0.000005	0.00003	0.0000007	0.000006	0.000000002
39-002(c)	0.000065	0.00000002	0.0000002	0.000004	0.00002	0.0000005	0.000004	0.000000002
39-002(f)	0.000085	0.00000002	0.0000002	0.000005	0.00003	0.0000007	0.000005	0.000000002
39-005	0.003	0.0000007	0.000008	0.0002	0.001	0.00003	0.0002	0.00000008
39-006(a) Active	0.003	0.0000007	0.000008	0.0002	0.001	0.00002	0.0002	0.00000007
39-007(a)	0.001	0.0000003	0.000003	0.00007	0.0004	0.00001	0.00008	0.00000003
39-007(d)	0.043	0.00001	0.0001	0.003	0.01	0.0003	0.003	0.000005
Extended Drainages	9.2	0.002	0.03	0.5	1	0.07	0.6	0.0002

*n/a = Not applicable.

Table H-5.4-13
Adjusted HIs for SWMU 39-002(a) Area 1

COPEC	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Copper	62.22	1.24E-06	9.87E-07	9.05E-04	2.29E-03	1.56E-03	3.01E-03	1.73E-05	**7.78E-01**	**8.89E-01**	9.75E-04	3.66E-09
Lead	52.62	9.61E-07	1.65E-06	1.39E-03	2.08E-03	1.82E-03	1.36E-03	1.07E-05	3.10E-02	**4.39E-01**	4.35E-04	3.18E-09
Mercury (inorganic)	0.646	1.73E-05	5.86E-05	5.10E-03	2.75E-02	1.62E-02	6.67E-04	2.20E-06	**1.29E+01**	1.90E-02	2.26E-04	3.14E-09
Acenaphthene	0.347	na*	na	na	na	na	6.72E-06	5.31E-08	na	**1.39E+00**	1.72E-06	1.25E-11
Aroclor-1254	0.116	1.50E-06	1.34E-05	4.93E-05	1.56E-03	8.02E-04	4.08E-04	1.67E-07	na	7.25E-04	1.57E-04	1.73E-07
Benzo(a)anthracene	1.725	na	na	na	na	na	1.57E-03	2.08E-05	na	9.58E-02	3.42E-04	1.21E-08
Bis(2-ethylhexyl)phthalate	0.216	1.05E-05	1.66E-04	5.97E-06	5.97E-03	2.99E-03	6.08E-04	5.99E-09	na	na	2.18E-04	4.03E-08
Chrysene	2.002	na	na	na	na	na	2.00E-03	2.31E-05	na	na	4.97E-04	1.79E-08
Di-n-butylphthalate	0.564	1.82E-05	5.97E-05	8.00E-04	2.84E-02	1.49E-02	4.72E-06	2.64E-09	na	3.53E-03	1.87E-06	2.52E-11
Fluoranthene	5.162	na	na	na	na	na	4.21E-04	1.49E-06	**5.16E-01**	na	1.40E-04	3.21E-09
Phenanthrene	4.134	na	na	na	na	na	8.53E-04	5.25E-06	**7.52E-01**	na	2.46E-04	3.19E-09
Pyrene	4.342	na	na	na	na	na	4.20E-04	2.96E-06	**4.34E-01**	na	1.18E-04	2.70E-09
Uranium-238	2.384	1.27E-09	1.44E-08	3.38E-07	3.88E-07	3.88E-07	3.52E-06	8.51E-08	4.33E-02	1.32E-03	6.76E-07	2.67E-10
Antimony	2.46	na	na	na	na	na	1.59E-02	6.36E-05	3.15E-02	**4.92E+01**	5.63E-03	1.22E-08
Cyanide (total)	20.8	9.70E-05	9.10E-04	1.15E-01	1.15E-01	1.15E-01	1.89E-04	2.11E-06	na	na	4.00E-05	2.12E-09
Aroclor-1260	0.155	9.18E-08	8.55E-07	1.86E-06	9.74E-05	5.04E-05	2.40E-05	3.87E-09	na	na	9.23E-06	2.48E-07
Tetryl	0.345	na	na	na	na	na	1.08E-03	2.35E-05	na	1.38E-02	5.87E-06	2.09E-10
TCDD[2,3,7,8-] equivalent	0.000000348	na	na	na	na	na	1.86E-03	5.43E-07	6.96E-08	na	7.15E-04	6.49E-08
HI		0.0001	0.001	0.1	0.2	0.2	0.6	0.0002	**15**	**52**	0.01	0.0000006

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.0.
*na = Not available.

Table H-5.4-14
Adjusted HIs for SWMU 39-002(a) Area 3

COPEC	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Copper	31.44	2.51E-05	4.99E-07	4.58E-04	1.16E-03	7.90E-04	1.52E-03	8.72E-06	3.93E-01	4.49E-01	4.93E-04	1.85E-09
Aroclor-1254	0.013	6.70E-06	1.50E-06	5.53E-06	1.75E-04	8.99E-05	4.57E-05	1.87E-08	na*	8.13E-05	1.76E-05	1.94E-08
Bis(2-ethylhexyl)phthalate	0.267	5.20E-04	2.05E-04	7.38E-06	7.38E-03	3.69E-03	7.52E-04	7.41E-09	na	na	2.70E-04	4.98E-08
Di-n-butylphthalate	0.54	6.96E-04	5.71E-05	7.66E-04	2.71E-02	1.42E-02	4.52E-06	2.53E-09	na	3.38E-03	1.79E-06	2.42E-11
TCDD[2,3,7,8-] equivalent	0.00000113	na	na	na	na	na	6.01E-03	1.76E-06	2.25E-07	na	2.31E-03	2.10E-07
Adjusted HI		0.001	0.0003	0.001	0.04	0.02	0.008	0.00001	0.4	0.5	0.003	0.0000003

*na = Not available.

Table H-5.4-15
Adjusted HIs for AOC 39-002(c)

Analyte	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Aroclor-1254	0.0158	0.09	0.07	0.01	**0.4**	0.2	0.02	0.0003	na*	0.0001	0.04	0.1
TCDD[2,3,7,8-] equivalent	0.0000004	na	na	na	na	na	0.7	0.008	0.00000008	na	**1.4**	**0.3**
Adjusted HI		0.09	0.07	0.01	0.4	0.2	0.7	0.008	0.00000008	0.0001	1	0.4

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.0.
*na = Not available.

Table H-5.4-16
Adjusted HIs for SWMU 39-005

COPEC	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Acenaphthene	0.24	na*	na	na	na	na	1.71E-06	1.35E-08	na	**9.60E-01**	4.39E-07	3.19E-12
Mercury (inorganic)	0.72	7.09E-06	2.41E-05	2.10E-03	1.13E-02	6.67E-03	2.74E-04	9.04E-07	**1.44E+01**	2.12E-02	9.29E-05	1.29E-09
TCDD[2,3,7,8-] equivalent	0.00000018	na	na	na	na	na	3.56E-04	1.04E-07	3.62E-08	na	1.37E-04	1.24E-08
Adjusted HI		0.000007	0.00002	0.002	0.01	0.007	0.0006	0.000001	**14**	1	0.0002	0.00000001

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.0.
*na = Not available.

Table H-5.4-17
Adjusted HIs for SWMU 39-006(a) Active Components

COPEC	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Mercury (inorganic)	0.669	0.000006	0.000002	0.002	0.01	0.006	0.0002	0.0000006	**13.4**	0.02	0.00008	0.000000001
Bis(2-ethylhexyl)phthalate	0.11	1.72E-06	2.71E-05	9.75E-07	9.75E-04	4.87E-04	9.93E-05	9.78E-10	na*	na	3.56E-05	6.57E-09
Adjusted HI		0.000008	0.00003	0.002	0.01	0.007	0.0003	0.0000006	**13**	0.02	0.0001	0.000000008

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.0.
*na = Not available.

Table H-5.4-18
Adjusted HIs for SWMU 39-007(a)

COPEC	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Aroclor-1254	2.598	4.32E-06	3.87E-05	1.43E-04	4.52E-03	2.32E-03	1.18E-03	4.83E-07	na*	1.62E-02	4.54E-04	5.00E-07
Aroclor-1260	3.122	2.38E-07	2.22E-06	4.84E-06	2.53E-04	1.31E-04	6.24E-05	1.01E-08	na	na	2.40E-05	6.44E-07
Bis(2-ethylhexyl)phthalate	0.193	1.21E-06	1.92E-05	6.88E-07	6.88E-04	3.44E-04	7.01E-05	6.91E-10	na	na	2.51E-05	4.64E-09
Aroclor-1242	0.24	2.61E-07	5.61E-07	1.71E-05	4.18E-04	2.17E-04	1.26E-04	7.73E-08	na	na	4.85E-05	4.33E-10
Aroclor-1248	0.35	4.95E-07	3.37E-06	2.50E-05	6.09E-04	3.16E-04	9.99E-03	5.73E-06	na	na	3.73E-03	1.35E-07
	Adjusted HI	0.000007	0.00006	0.0002	0.006	0.003	0.01	0.000007	na	0.02	0.004	0.000001

*na = Not available.

Table H-5.4-19
Adjusted HIs for AOC 39-007(d)

COPEC	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Aroclor-1242	0.66	2.58E-05	5.55E-05	1.69E-03	4.13E-02	2.14E-02	1.25E-02	7.64E-06	na*	na	4.80E-03	4.28E-08
Aroclor-1254	0.382	2.28E-05	2.04E-04	7.54E-04	2.39E-02	1.22E-02	6.23E-03	2.55E-06	na	2.39E-03	2.40E-03	2.64E-06
Bis(2-ethylhexyl)phthalate	0.53	1.20E-04	1.89E-03	6.80E-05	6.80E-02	3.40E-02	6.92E-03	6.82E-08	na	na	2.48E-03	4.58E-07
Methylnaphthalene[2-]	6.35	na	na	na	na	na	2.40E-02	1.38E-04	na	na	7.02E-03	5.07E-08
Phenanthrene	5.73	na	na	na	na	na	5.49E-03	3.37E-05	1.04	na	1.58E-03	2.05E-08
Adjusted HI		0.007	0.002	0.003	0.1	0.07	0.06	0.0002	1	0.03	0.02	0.000003

*na = Not available.

Table H-5.4-20
Adjusted HIs for SWMU 39-010

COPEC	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Copper	443.2	7.61E-04	6.06E-04	**5.56E-01**	**1.41E+00**	**9.61E-01**	**1.85E+00**	1.06E-02	**5.54E+00**	**6.33E+00**	**5.99E-01**	2.25E-06
Mercury (inorganic)	0.51	1.17E-03	3.99E-03	**3.47E-01**	**1.87E+00**	**1.11E+00**	4.54E-02	1.50E-04	**1.02E+01**	1.50E-02	1.54E-02	2.14E-07
Di-n-butylphthalate	0.628	1.74E-03	5.73E-03	7.68E-02	**2.72E+00**	**1.43E+00**	4.53E-04	2.54E-07	na*	3.93E-03	1.79E-04	2.42E-09
Uranium-238	24.42	1.13E-06	1.27E-05	2.99E-04	3.42E-04	3.42E-04	3.10E-03	7.51E-05	**4.44E-01**	1.36E-02	5.97E-04	2.36E-07
Aroclor-1254	0.0147	1.63E-05	1.46E-04	5.39E-04	1.71E-02	8.76E-03	4.46E-03	1.83E-06	na	9.19E-05	1.72E-03	1.89E-06
Bis(2-ethylhexyl)phthalate	0.84	3.53E-03	5.57E-02	2.00E-03	**2.00E+00**	**1.00E+00**	2.04E-01	2.01E-06	na	na	7.31E-02	1.35E-05
RDX	25.3	2.39E-05	5.03E-05	1.01E-01	5.48E-02	7.54E-02	5.20E-02	7.78E-04	**3.37E+00**	2.53E-01	8.66E-03	7.18E-08
TCDD[2,3,7,8-] equivalent	0.00000236	na	na	na	na	na	**1.09E+00**	3.18E-04	4.72E-07	na	**4.18E-01**	3.79E-05
Adjusted HI		0.007	0.07	1	**8**	**5**	**4**	0.02	**21**	**8**	1	0.00007

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.0.
*na = Not available.

Table H-5.4-21
Adjusted HIs for the Extended Drainages

COPEC	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Copper	71.72	1.41E-03	1.13E-03	**1.03E+00**	**2.62E+00**	**1.79E+00**	**1.12E+00**	1.97E-02	8.97E-01	**1.02E+00**	**1.11E+00**	4.18E-06
Mercury (inorganic)	1.518	4.02E-02	1.36E-01	**1.19E+01**	**6.39E+01**	**3.78E+01**	**5.06E-01**	5.12E-03	**3.04E+01**	4.46E-02	5.27E-01	7.31E-06
Aroclor-1254	0.0398	5.08E-04	4.55E-03	1.68E-02	5.32E-01	2.72E-01	4.52E-02	5.68E-05	na*	2.49E-04	5.33E-02	5.88E-05
Aroclor-1260	0.0779	4.57E-05	4.26E-04	9.27E-04	4.85E-02	2.51E-02	3.90E-03	1.93E-06	na	na	4.59E-03	1.23E-04
Bis(2-ethylhexyl)phthalate	0.72	3.47E-02	5.48E-01	1.97E-02	**1.97E+01**	**9.86E+00**	**6.55E-01**	1.98E-05	na	na	7.20E-01	1.33E-04
Di-n-butylphthalate	0.17	5.42E-03	1.78E-02	2.39E-01	**8.46E+00**	**4.43E+00**	1.41E-03	7.88E-07	na	1.06E-03	5.57E-04	7.53E-09
Adjusted HI		0.08	0.7	**13**	**96**	**55**	**2**	0.02	**31**	1	**2**	0.0003

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.0.
*na = Not available.

Table H-5.4-22
Adjusted HIs for SWMU 39-006(a) Inactive Components

COPEC	EPC (mg/kg)	American Kestrel (intermediate carnivore)	American Kestrel (top carnivore)	American Robin (herbivore)	American Robin (insectivore)	American Robin (omnivore)	Deer Mouse (omnivore)	Desert Cottontail (herbivore)	Earthworm	Plant	Montane Shrew (insectivore)	Red Fox (carnivore)
Aroclor-1254	0.0188	7.11E-07	6.37E-06	2.35E-05	7.44E-04	3.82E-04	1.94E-04	7.95E-08	na*	1.18E-04	7.47E-05	8.23E-08
Bis(2-ethylhexyl)phthalate	0.42	6.00E-05	9.48E-04	3.41E-05	3.41E-02	1.70E-02	3.47E-03	3.42E-08	na	na	1.24E-03	2.30E-07
Cyanide (total)	4.637	6.35E-05	5.96E-04	7.53E-02	7.53E-02	7.53E-02	1.24E-04	1.38E-06	na	na	2.62E-05	1.38E-09
Di-n-butylphthalate	0.039	3.69E-06	1.21E-05	1.62E-04	5.76E-03	3.02E-03	9.58E-07	5.36E-10	na	2.44E-04	3.79E-07	5.12E-12
Phenol	0.49	na	na	na	na	na	1.17E-04	2.51E-06	2.72E-01	**6.20E-01**	1.56E-06	1.89E-11
Adjusted HI		0.0001	0.002	0.08	0.1	0.1	0.004	0.000006	0.3	0.6	0.001	0.0000003

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.0.
*na = Not available.

Attachment H-1

Toxic Equivalent Factor Calculations
(on CD included with this document)

Attachment H-2

ProUCL Files
(on CD included with this document)

Attachment H-3

Ecological Scoping Checklists

H3-1.0 SWMU 39-002(a) AREA 1

PART A—SCOPING MEETING DOCUMENTATION

Site ID	SWMU 39-002(a)-Area 1
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.	SWMU 39-002(a)-area 1 is an outside SAA adjacent to the corner of a building for storage of drums, solvents and solvent contaminated rags/wipes, lead-containing materials and PCB transformers. The storage area is unpaved and uncovered. Previous sampling identified metals, PAHs, PCBs, and uranium as COPCs though later sampling did not find these COPCs. Potential release mechanisms for this site include spills to soil, runoff to soil from storage area or pad, and infiltration of material into soil below the pad.
List of Primary Impacted Media **(Indicate all that apply.)**	**Surface soil –** yes **Surface water/sediment –** n/a **Subsurface –** yes **Groundwater –** n/a **Other, explain –** none
Vegetation class based on GIS vegetation coverage **(Indicate all that apply.)**	**Water** – **Bare Ground/Unvegetated** – yes **Spruce/fir/aspen/mixed conifer** – **Ponderosa pine –** **Piñon juniper/juniper savannah** – **Grassland/shrubland** – **Developed** – yes **Burned –**
Is T&E Habitat Present? **If applicable, list species known or suspected of using the site for breeding or foraging.**	No, outside of area in the canyon that serves as habitat for Mexican spotted owl
Provide list, of Neighboring/ Contiguous/ Upgradient sites, includes a brief summary of COPCs and the form of releases for relevant sites and reference a map as appropriate. **(Use this information to evaluate the need to aggregate sites for screening.)**	This site lies across the road from upgradient sites and from the extended drainages. There is no indication of COPC migration between these sites and adjacent sites.
Surface Water Erosion Potential Information **Summarize information from SOP 2.01, including the total score and the run-off subscore (maximum of 46); terminal point of surface water transport; slope; and surface water run-on sources.**	The site is a relatively flat area of disturbed soil west of a concrete walkway that serves as a barrier to surface water flow. The SWMU also includes the area on the other side of the walkway; but that area is completely paved (samples were taken through the pavement). The potential for surface water transport is therefore low for this site.

PART B—SITE VISIT DOCUMENTATION

Site ID	SWMU 39-002(a)-area 1
Date of Site Visit	5/07/2009
Site Visit Conducted by	Kirby Olson, Ph.D.

Receptor Information:

Estimate cover	**Relative vegetative cover (high, medium, low, none)** = none **Relative wetland cover (high, medium, low, none)** = none **Relative structures/asphalt, etc., cover (high, medium, low, none)** = about 50% asphalt/concrete
Field notes on the GIS vegetation class to assist in verifying the Arcview information	The area west of the concrete walkway is bare disturbed soil, though trees and vegetation are present at the edge of the canyon wall west of the SWMU area. The area east of the concrete walkway is covered in asphalt all the way to the road.
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.**	Terrestrial receptors such as small mammals could potentially temporarily use the disturbed soil area of the site. The site does not contain habitat for nesting or foraging. No burrows were noted during the site visit

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).**	No evidence of surface water run-on or runoff was seen during the site visit.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	The concrete walkway spanning the center of the site is elevated about half a foot from the surface, and would effectively prevent the disturbed soil from migrating across the sight slope on the asphalt. No pathway to groundwater is likely because it is 550 ft to groundwater. Air transport of contamination off-site in dust is possible in the bare soil area, but is limited due to the size of the site and its proximity to buildings that disrupt wind patterns.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	All of the sites is disturbed area: the bare soil behind the walkway is devoid of vegetation, the remainder of the site has concrete or asphalt
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	Soil area is devoid of vegetation, animal burrows, etc. Apparent cause is proximity to two buildings and active parking lot; bare soil appears to have foot traffic across it.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to off-site 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 the likelihood that future construction activities could make contamination more available for exposure or transport. There are no compete exposure pathways in the area covered by concrete and asphalt. There is potential exposure in the exposed soil area; therefore the remainder of the checklist was completed for this bare soil portion.

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature and extent of contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if the maximum value was captured by existing sample data.)**	Yes. The sampling approach in the approved work plan (LANL 2007, 098281) included a sampling grid over the bare area and under the asphalt to identify the nature and extent of any potential contamination at SWMU 39-002(a)-area 1.
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 be aggregated to characterize potential ecological risk.)**	Yes. The sampling approach in the approved work plan (LANL 2007, 098281) included a sampling grid over the bare area and under the asphalt to address potential transport pathways of contamination at SWMU 39-002(a)-area 1.

Additional Field Notes:

Provide additional field notes on the site setting and potential ecological receptors. No additional notes are provided

PART C—ECOLOGICAL PATHWAYS CONCEPTUAL EXPOSURE MODEL

Provide answers to Questions A to V to develop the Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors through vapors?

- **Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant >10^{-5} atm-m^3/mol and molecular weight <200 g/mol).**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: The COPECs do not include VOCs.

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 site consists in part of bare soil in an area previously used for storage of materials.

Question C:

Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?

- **If the SOP 2.01 run-off score* for each SWMU and/or AOC included in the site is equal to zero, this suggests that erosion at the site is not a transport pathway. (* note that the runoff score is not the entire erosion potential score, rather it is a subtotal of this score with a maximum value of 46 points).**
- **If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: No aquatic communities are present at the site. There are no pathways to off-site aquatic communities from the site

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 through 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.**
- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: The depth to regional groundwater is approximately 550 ft. There are no seeps, springs, or shallow groundwater in the area.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- **The potential for contaminants to migrate to groundwater.**
- **The potential for contaminants to migrate through 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.**
- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: The depth to regional groundwater is approximately 550 ft and the area is dry. There are no seeps, springs, or shallow groundwater in the area.

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: Site is in the canyon bottom.

Question G:

Could airborne contaminants interact with receptors through the respiration of vapors?

- **Contaminants must be present as volatiles in the air.**
- **Consider the importance of the inhalation of vapors for burrowing animals.**
- **Foliar uptake of 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: 0

Terrestrial Animals: 0

Provide explanation: Volatile contaminants are not COPECs.

Question H:

Could airborne contaminants interact with plants through the deposition of particulates or with animals through the inhalation of fugitive dust?

- **Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.**
- **Exposure through the 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: Disturbed conditions and proximity to active operations buildings at the site limit burrowing. COPECs in surface soil could be suspended as 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: 1

Provide explanation: Plants are not present in the contaminated area of the site and plants away from the site are unlikely to be affected by rain splash

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: 1

Provide explanation: Site is disturbed or developed, which is unlikely to provide food items from within the contaminated area.

Question K:

Could contaminants interact with receptors through the 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: 1

Provide explanation: Site is disturbed or developed, which provides no suitable habitat.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

- **Significant exposure through 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: 1

Provide explanation: Site is disturbed or developed, which provides no suitable habitat. However, PAHs and PCBs were among the COPECs identified.

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 retained as COPECs.

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: No water or sediment is found at the site.

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: No water or sediment is found at the site.

Question P:

Could contaminants interact with receptors through the 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: No water or sediment is found at the site. The extremely sandy soil is unlikely to retain storm water long enough to act as a drinking water source.

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: o water or sediment is found at the site.

Question R:

Could suspended or sediment-based 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 sediment is found at this site.

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: No aquatic communities are found at this site.

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: No aquatic communities are found at this site.

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: No aquatic communities are found at this site.

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; therefore, 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):

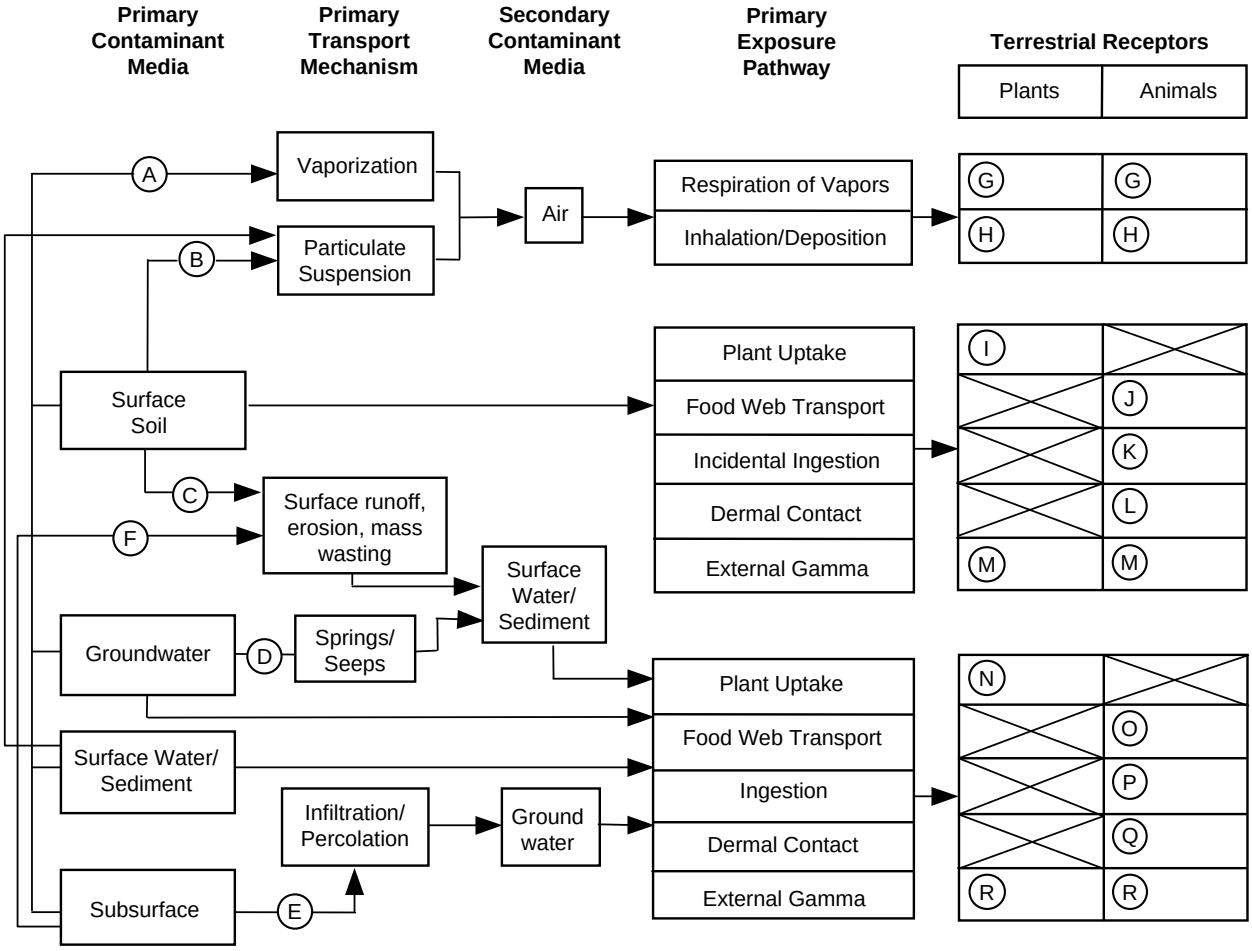
Aquatic Plants: 0

Aquatic Animals: 0

Provide explanation: No aquatic communities are found at this site.

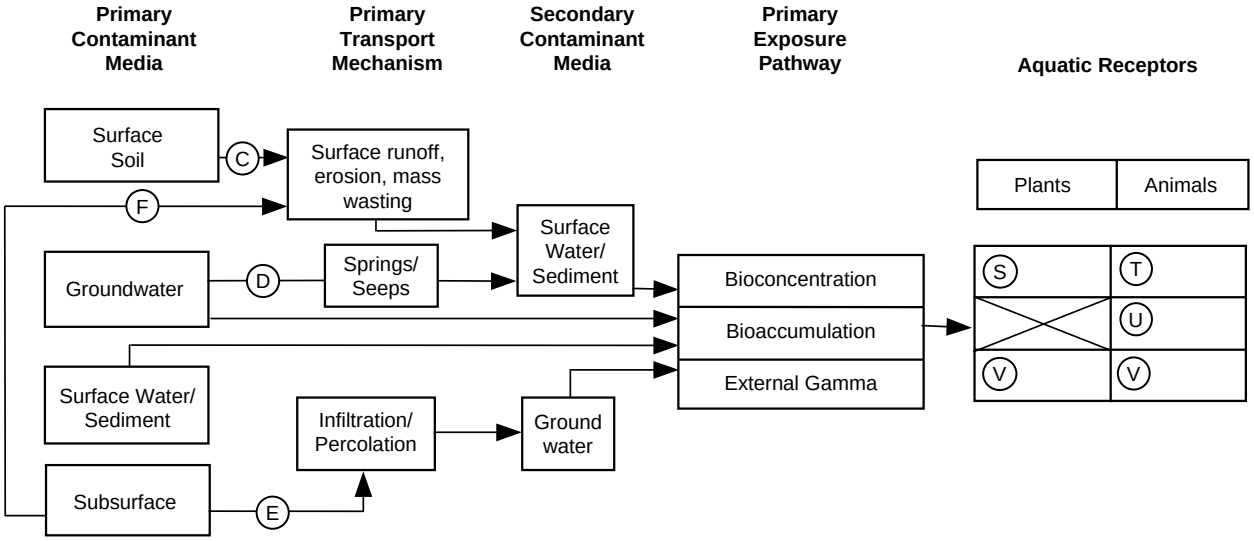
Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the Scoping Checklist



Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the Scoping Checklist



Signatures and certifications:

Checklist completed by (provide name, organization, and phone number):

Name (printed): Kirby Olson, Ph.D.
Name (signature): Kirby S. Olson
Organization: Portage, Inc.
Phone number: 505-662-7600
Date completed: 08/07/2009

Verification by another party (provide name, organization, and phone number):

Name (printed): Richard Mirenda, Ph.D.
Name (signature): Richard Mirenda
Organization: Los Alamos National Laboratory, EP-WES-EDA
Phone number: 505-665-6953

H3-2.0 SWMU 39-002(a) Area 3, AOC 39-002(b), AOC 39-002(c), AND AOC 39-002(f)

PART A—SCOPING MEETING DOCUMENTATION

Site ID	SWMU 39-002(a) Area 3, AOC 39-002(b), AOC 39-002(c), and AOC 39-002(f)
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.	SWMU 39-002(a)-area 3 is currently an active SAA outside a building on asphalt for storage of materials and holding/receiving area. No previous sampling was done at this site. AOC 39-002(b) is currently an active SAA outside a building on a 5 ft x 5 ft concrete pad adjacent to firing support structure 39-06 used for storage of chemicals. Previous sampling done at this site indicated PCBs and inorganic metals above background. AOC 39-002(c) is a former SAA on an asphalt pad and adjacent to the gas gun support structure 39-56 used for storage of waste paper, solvent-contaminated rags, and vacuum grease. Previous sampling done at this site indicated inorganic metals above background. A VCA was conducted in 1995, which excavated and backfilled four areas. AOC 39-002(f) is a former SAA on an asphalt driveway adjacent to support structure 39-88 used for storage of waste solvents, copper sulfate, transformer oil, photographic wastes, and vacuum grease. Previous sampling was not done at this site. At all these sites potential releases are through runoff from asphalt or concrete to adjacent soil or through cracks to area under asphalt or concrete.
List of Primary Impacted Media **(Indicate all that apply.)**	**Surface soil –** no **Surface water/sediment –** n/a **Subsurface –** yes **Groundwater –** n/a **Other, explain –** none
Vegetation class based on GIS vegetation coverage **(Indicate all that apply.)**	**Water** – **Bare Ground/Unvegetated** – **Spruce/fir/aspen/mixed conifer** – **Ponderosa pine –** **Piñon juniper/juniper savannah** – **Grassland/shrubland** – **Developed** – yes **Burned –**
Is T&E Habitat Present? **If applicable, list species known or suspected of using the site for breeding or foraging.**	No, sites are covered with asphalt or concrete.
Provide list, of Neighboring/ Contiguous/ Upgradient sites, includes a brief summary of COPCs and the form of releases for relevant sites and reference a map as appropriate. **(Use this information to evaluate the need to aggregate sites for screening.)**	n/a

Surface Water Erosion Potential Information **Summarize information from SOP 2.01, including the total score and the run-off subscore (maximum of 46); terminal point of surface water transport; slope; and surface water run-on sources.**	None, sites are covered with asphalt or concrete.

PART B—SITE VISIT DOCUMENTATION

Site ID	SWMU 39-002(a) Area 3, AOC 39-002(b), AOC 39-002(c), and AOC 39-002(f)
Date of Site Visit	5/07/2009
Site Visit Conducted by	Kirby Olson, Ph.D.

Receptor Information:

Estimate cover	**Relative vegetative cover (high, medium, low, none)** = none **Relative wetland cover (high, medium, low, none)** = none **Relative structures/asphalt, etc., cover (high, medium, low, none)** = high
Field notes on the GIS vegetation class to assist in verifying the Arcview information	No vegetation present, all sites are covered in asphalt or concrete.
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.**	No receptors present due to lack of suitable habitat.

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).**	None, sites are inaccessible to surface water.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	No, sites are covered with asphalt or concrete. During the site visit each site was checked to ensure that the covering material was reasonably intact and not visibly degrading.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	Sites are covered in asphalt/concrete.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	Sites are covered in asphalt/concrete and adjacent to either operational buildings or firing site support structures, no suitable ecological habitat is present at any of the sites.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to off-site 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 the likelihood that future construction activities could make contamination more available for exposure or transport.

The site visit confirmed that all four sites are covered in asphalt/concrete (generally contiguous with paved parking or a paved road) and adjacent to either operational buildings or firing site support structures. Therefore, these sites have no suitable habitat or ecological receptors on-site. These areas are actively in use, so the asphalt and concrete are intact and maintained, which indicates that there will continue to be no transport pathways at these sites. No future construction is planned that would remove the asphalt or concrete from these areas.

Signatures and certifications:

Checklist completed by (provide name, organization, and phone number):

Name (printed): Kirby Olson, Ph.D.
Name (signature): Kirby S. Olson
Organization: Portage, Inc.
Phone number: 505-662-7600
Date completed: 08/09/2009

Verification by another party (provide name, organization, and phone number):

Name (printed): Richard Mirenda, Ph.D.
Name (signature): Richard Mirenda
Organization: Los Alamos National Laboratory, EP-WES-EDA
Phone number: 505-665-6953

H3-3.0 SWMU 39-005

PART A—SCOPING MEETING DOCUMENTATION

Site ID	SWMU 39-005
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.	A former seepage pit used for the disposal of HE-contaminated liquids from the operations building. Unlined pit measured 5 ft X 5 ft X 7 ft. Gravel and HE-contaminated soil in pit removed in 1996. Potential release mechanism is leaching through soil from the side and bottom of the former pit.
List of Primary Impacted Media **(Indicate all that apply.)**	**Surface soil –** yes **Surface water/sediment –**n/a **Subsurface –** yes **Groundwater –** n/a **Other, explain –** none
Vegetation class based on GIS vegetation coverage **(Indicate all that apply.)**	**Water** – **Bare Ground/Unvegetated –** yes **Spruce/fir/aspen/mixed conifer –** **Ponderosa pine –** yes **Piñon juniper/juniper savannah –** yes **Grassland/shrubland –** yes **Developed** – **Burned –**
Is T&E Habitat Present? **If applicable, list species known or suspected of using the site for breeding or foraging.**	No, outside of area in the canyon that serves as habitat for Mexican spotted owl.
Provide list, of Neighboring/ Contiguous/ Upgradient sites, includes a brief summary of COPCs and the form of releases for relevant sites and reference a map as appropriate. **(Use this information to evaluate the need to aggregate sites for screening.)**	This site lies near the base of the canyon wall away from the extended drainages. There is no indication of COPC migration between this site and upgradient sites, which are approximately 3000 ft up the canyon.
Surface Water Erosion Potential Information **Summarize information from SOP 2.01, including the total score and the run-off subscore (maximum of 46); terminal point of surface water transport; slope; and surface water run-on sources.**	The site is a relatively flat area of disturbed soil northwest of a support building. There was no visible evidence of run-on or runoff at this site. The potential for surface water transport is low for this site.

PART B—SITE VISIT DOCUMENTATION

Site ID	SWMU 39-005
Date of Site Visit	5/07/2009
Site Visit Conducted by	Kirby Olson, Ph.D.

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)** = none
Field notes on the GIS vegetation class to assist in verifying the Arcview information	The area northwest of the support building is bare disturbed soil, though trees and vegetation are present at the edge of the canyon wall east of the SWMU area.
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.**	Terrestrial receptors such as small mammals may temporarily use the disturbed soil area of the site. The site does not contain suitable habitat for nesting or foraging. No burrows were noted during the site visit.

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).**	No evidence of surface water runoff at the site was found during the site visit. There are some shallow rills running vertically down the cliff slope adjacent to (but not over) the site, indicating that water may flow down the cliff during rain storms.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	No evidence of surface water runoff at the site was found during the site visit; therefore, no off-site transport pathways cross SWMU 39-005. No pathway to groundwater is likely because it is 550 ft to groundwater. Air transport of contamination off-site in dust is possible, but is limited due to the size of the site and its proximity to buildings that disrupt wind patterns.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	The area was previously disturbed during the 1996 removal action. The area continues to be primarily bare soil.

Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	The area of soil over the location of the former seepage pit continues to have almost no vegetation even though vegetation exists off-site nearby. The apparent cause is likely to be the previous site disturbance and possibly foot traffic from the adjacent building.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to off-site 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 the 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 and extent of contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if the maximum value was captured by existing sample data.)**	Yes. The sampling approach in the approved work plan (LANL 2007, 098281) included a sampling grid over the bare area from the surface to 10 ft bgs to identify the nature and extent of any contamination at SWMU 39-005.
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 be aggregated to characterize potential ecological risk.)**	Yes. The sampling approach in the approved work plan (LANL 2007, 098281) included a sampling grid over the bare area from the surface to 10ft bgs to address potential transport pathways at SWMU 39-005.

Additional Field Notes:

Provide additional field notes on the site setting and potential ecological receptors. No additional notes are provided

PART C—ECOLOGICAL PATHWAYS CONCEPTUAL EXPOSURE MODEL

Provide answers to Questions A to V to develop the Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors through vapors?

- **Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant >10^{-5} atm-m^3/mol and molecular weight <200 g/mol).**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: COPECs in the subsurface include only trace levels of VOCs.

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: The site consists of bare soil in an area previously excavated and backfilled with clean material.

Question C:

Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?

- **If the SOP 2.01 run-off score* for each SWMU and/or AOC included in the site is equal to zero, this suggests that erosion at the site is not a transport pathway. (* note that the runoff score is not the entire erosion potential score, rather it is a subtotal of this score with a maximum value of 46 points).**
- **If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: No aquatic communities are present at the site. There are no pathways to off-site aquatic communities from the site.

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 through 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.**
- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: The depth to regional groundwater is approximately 550 ft. There are no seeps, springs, or shallow groundwater in the area.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- **The potential for contaminants to migrate to groundwater.**
- **The potential for contaminants to migrate through 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.**
- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: The depth to regional groundwater is approximately 550 ft. There are no seeps, springs, or shallow groundwater in the area.

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: Site is in the canyon bottom.

Question G:

Could airborne contaminants interact with receptors through the respiration of vapors?

- **Contaminants must be present as volatiles in the air.**
- **Consider the importance of the inhalation of vapors for burrowing animals.**
- **Foliar uptake of 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: Only trace concentrations of VOCs reported.

Question H:

Could airborne contaminants interact with plants through the deposition of particulates or with animals through the inhalation of fugitive dust?

- **Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.**
- **Exposure through the 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: Disturbed conditions and proximity to active operations buildings at the site limit burrowing.

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: 1

Provide explanation: Almost no plants are present in the contaminated area of the site and plants away from the site are unlikely to be affected by rain splash.

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: 1

Provide explanation: Site is disturbed and developed, which is unlikely to provide food items from within the contaminated area, and most contamination is in the subsurface.

Question K:

Could contaminants interact with receptors through the 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: 1

Provide explanation: Site is disturbed and developed, which provides no suitable habitat, and contamination was primarily subsurface.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

- **Significant exposure through 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: 1

Provide explanation: Site is disturbed and developed, which provides no suitable habitat, and contamination was primarily 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 retained as COPECs.

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: No water or sediment is found at the site.

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: No water or sediment is found at the site.

Question P:

Could contaminants interact with receptors through the 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: No water or sediment is found at the site. The extremely sandy soil is unlikely to retain storm water long enough to act as a drinking water source

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: No water or sediment is found at the site.

Question R:

Could suspended or sediment-based 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 sediment is found at this site.

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: No aquatic communities are found at this site.

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: No aquatic communities are found at this site.

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: No aquatic communities are found at this site.

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; therefore, 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):

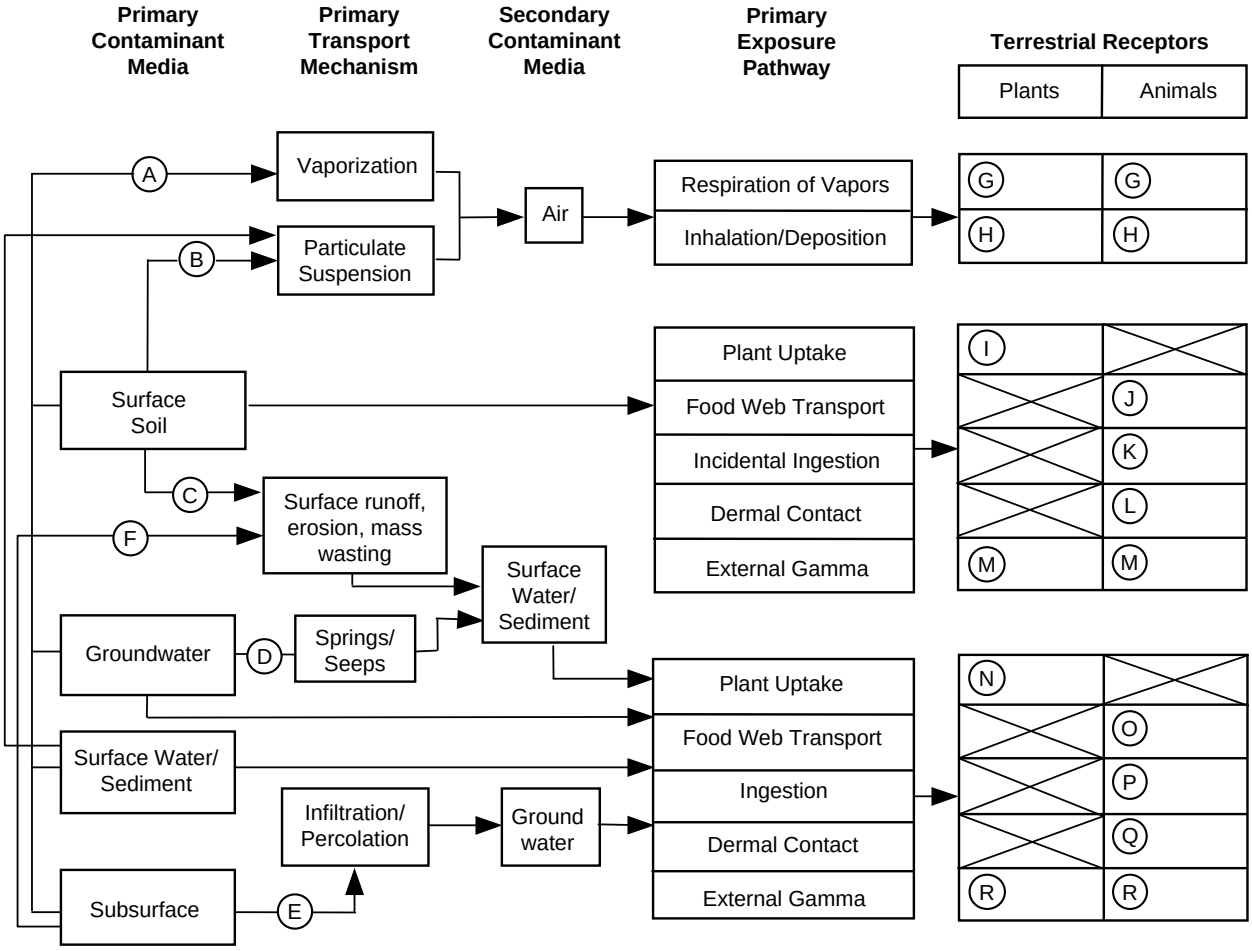
Aquatic Plants: 0

Aquatic Animals: 0

Provide explanation: No aquatic communities are found at this site.

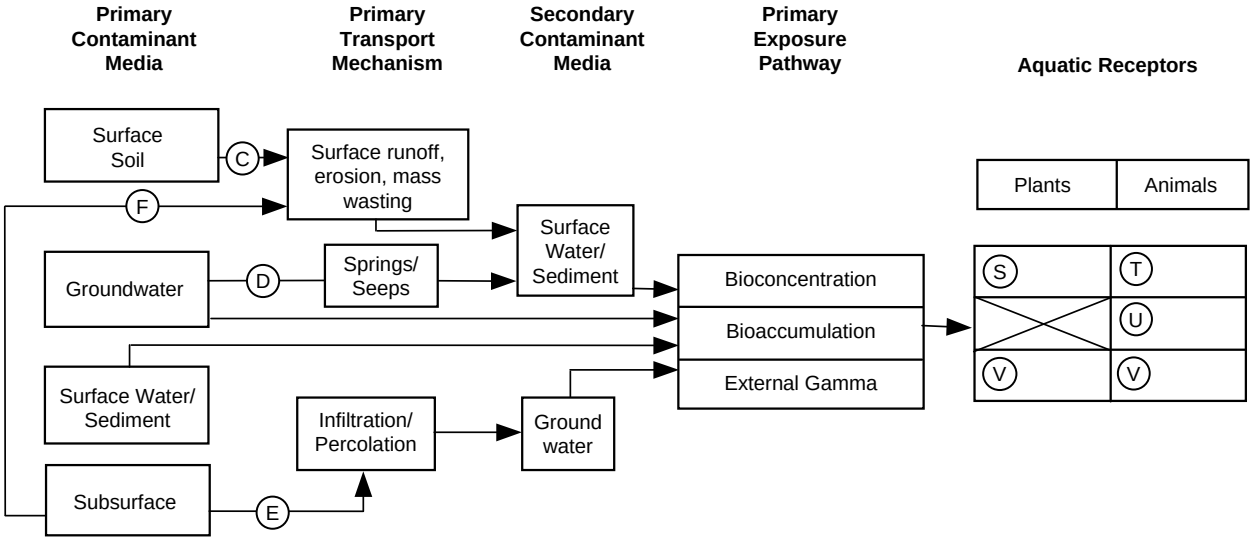
Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the Scoping Checklist



Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the Scoping Checklist



Signatures and certifications:

Checklist completed by (provide name, organization, and phone number):

Name (printed): Kirby Olson, Ph.D.
Name (signature): Kirby S. Olson
Organization: Portage, Inc.
Phone number: 505-662-7600
Date completed: 08/07/2009

Verification by another party (provide name, organization, and phone number):

Name (printed): Richard Mirenda, Ph.D.
Name (signature): Richard Mirenda
Organization: Los Alamos National Laboratory, EP-WES-EDA
Phone number: 505-665-6953

H3-4.0 SWMU 39-006(a)

PART A—SCOPING MEETING DOCUMENTATION

Site ID	SWMU 39-006(a)
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.	SWMU 39-006(a) encompasses the subsurface elements of a septic system and an outfall that has been blocked from receiving further discharges from the septic system. Three subsurface elements (the inactive septic tank, seepage pit, and sand filter) were excavated during the 2009 field activities, these areas were backfilled and the surface restored with vegetation. The inactive and active sewer lines remain in the subsurface. No excavation/removal occurred at the outfall. Mechanisms for releases include spills or leaks from these subsurface structures to the subsurface soil when the septic tank, filter, and seepage pit were in use. Releases at the outfall before it was plugged were also a mechanism for releases.
List of Primary Impacted Media **(Indicate all that apply.)**	**Surface soil –** n/a **Surface water/sediment –**n/a **Subsurface –** yes **Groundwater –** n/a **Other, explain –** none
Vegetation class based on GIS vegetation coverage **(Indicate all that apply.)**	**Water** – **Bare Ground/Unvegetated** – **Spruce/fir/aspen/mixed conifer** – **Ponderosa pine –** yes **Piñon juniper/juniper savannah** – **Grassland/shrubland** – yes **Developed** – **Burned –**
Is T&E Habitat Present? **If applicable, list species known or suspected of using the site for breeding or foraging.**	No, outside of area in the canyon that serves as habitat for Mexican spotted owl.
Provide list, of Neighboring/ Contiguous/ Upgradient sites, includes a brief summary of COPCs and the form of releases for relevant sites and reference a map as appropriate. **(Use this information to evaluate the need to aggregate sites for screening.)**	This site lies near State Highway 4 next to the drainage channel. There is no indication of COPC migration between this site and upgradient sites.
Surface Water Erosion Potential Information **Summarize information from SOP 2.01, including the total score and the run-off subscore (maximum of 46); terminal point of surface water transport; slope; and surface water run-on sources.**	The site is a relatively flat area. There was no visible evidence of run-on or runoff at this site. The potential for surface water transport is low for this site.

PART B—SITE VISIT DOCUMENTATION

Site ID	SWMU 39-006(a)
Date of Site Visit	5/07/2009
Site Visit Conducted by	Kirby Olson, Ph.D.

Receptor Information:

Estimate cover	**Relative vegetative cover (high, medium, low, none)** = high **Relative wetland cover (high, medium, low, none)** = none **Relative structures/asphalt, etc., cover (high, medium, low, none)** = none
Field notes on the GIS vegetation class to assist in verifying the Arcview information	The edge of the area contains mature trees from before the site excavation. The excavated area has been restored with a mixture of grasses and forbs to a flat field.
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.**	The restored site is a grassy field and therefore contains habitat for terrestrial receptors. The surrounding area across the drainage channel and State Highway 4 contain intact ecosystems from which ecological receptors may come to inhabit the site.

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).**	No evidence of surface water runoff at the site was seen during the site visit.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	No evidence of surface water runoff at the site was seen during the site visit; therefore, it is believed that no off-site transport pathways cross SWMU 39-006(a). No pathway to groundwater is likely because it is 550 ft to groundwater.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	The area was disturbed during the 2009 removal action. The area has been restored through backfilling, grading, and revegetation.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	The area was disturbed during the 2009 removal action. The area has been restored through backfilling, grading, and revegetation.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to off-site 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 the 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 and extent of contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if the maximum value was captured by existing sample data.)**	Yes. The sampling approach in the approved work plan (LANL 2007, 098281) included a post-excavation sampling grid over the base of the excavation and at two depths on the walls to identify the nature and extent of any contamination at SWMU 39-006(a).
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 be aggregated to characterize potential ecological risk.)**	Yes. The sampling approach in the approved work plan (LANL 2007, 098281) included a post-excavation sampling grid over the base of the excavation and at two depths on the walls to identify the nature and extent of any contamination at SWMU 39-006(a).

Additional Field Notes:

Provide additional field notes on the site setting and potential ecological receptors. No additional notes are provided

PART C—ECOLOGICAL PATHWAYS CONCEPTUAL EXPOSURE MODEL

Provide answers to Questions A to V to develop the Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors through vapors?

- **Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant >10^{-5} atm-m^3/mol and molecular weight <200 g/mol).**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: The COPECs are in the subsurface and include only trace levels of VOCs.

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: The COPECs remaining after excavation are in the subsurface and are covered with clean fill.

Question C:

Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?

- **If the SOP 2.01 run-off score* for each SWMU and/or AOC included in the site is equal to zero, this suggests that erosion at the site is not a transport pathway. (* note that the runoff score is not the entire erosion potential score, rather it is a subtotal of this score with a maximum value of 46 points).**
- **If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: No aquatic communities are present at the site. There are no pathways to off-site aquatic communities from the site.

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 through 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.**
- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: The depth to regional groundwater is approximately 550 ft. There are no seeps, springs, or shallow groundwater in the area.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- **The potential for contaminants to migrate to groundwater.**
- **The potential for contaminants to migrate through 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.**
- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: The depth to regional groundwater is approximately 550 ft. There are no seeps, springs, or shallow groundwater in the area.

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: site is in canyon bottom

Question G:

Could airborne contaminants interact with receptors through the respiration of vapors?

- **Contaminants must be present as volatiles in the air.**
- **Consider the importance of the inhalation of vapors for burrowing animals.**
- **Foliar uptake of 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: Sampling results from 2009 indicated only trace concentrations of VOCs.

Question H:

Could airborne contaminants interact with plants through the deposition of particulates or with animals through the inhalation of fugitive dust?

- **Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.**
- **Exposure through the 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: COPECs were in subsurface soil.

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: 1

Provide explanation: COPECs are subsurface.

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: 1

Provide explanation: COPECs are in the subsurface at this site.

Question K:

Could contaminants interact with receptors through the 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: 1

Provide explanation: COPECs are in the subsurface at this site.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

- **Significant exposure through 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: 1

Provide explanation: COPECs are in the subsurface 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: 0

Terrestrial Animals: 0

Provide explanation: No gamma emitting radionuclides were retained as COPECs.

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: No water or sediment is found at the site.

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: No water or sediment is found at the site.

Question P:

Could contaminants interact with receptors through the 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: No water or sediment is found at the site. The soil is unlikely to retain storm water long enough to act as a drinking water source.

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: No water or sediment is found at this site.

Question R:

Could suspended or sediment-based 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 sediment is found at this site.

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: No aquatic communities are found at this site.

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: No aquatic communities are found at this site.

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: No aquatic communities are found at this site.

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; therefore, 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):

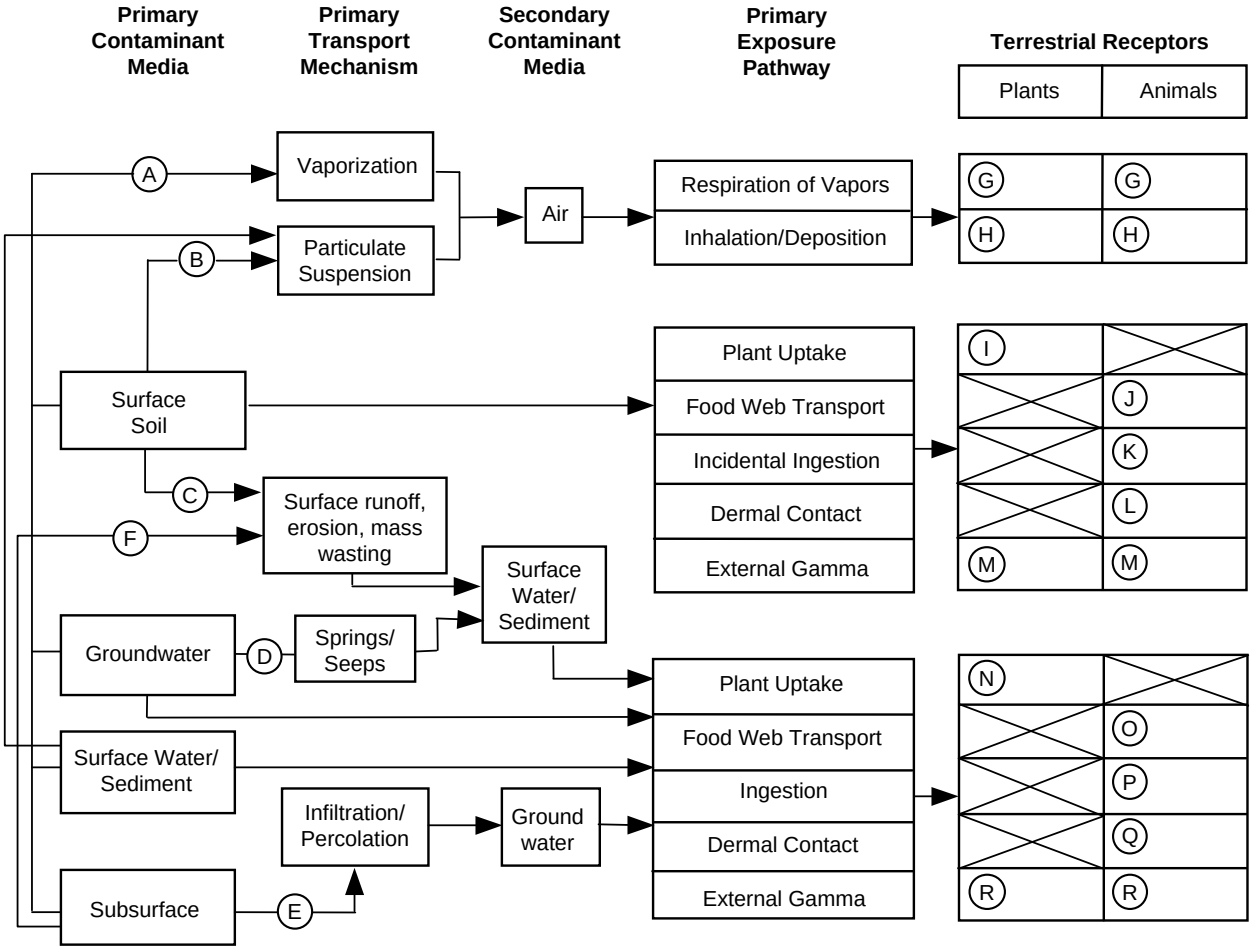
Aquatic Plants: 0

Aquatic Animals: 0

Provide explanation: No aquatic communities are found at this site.

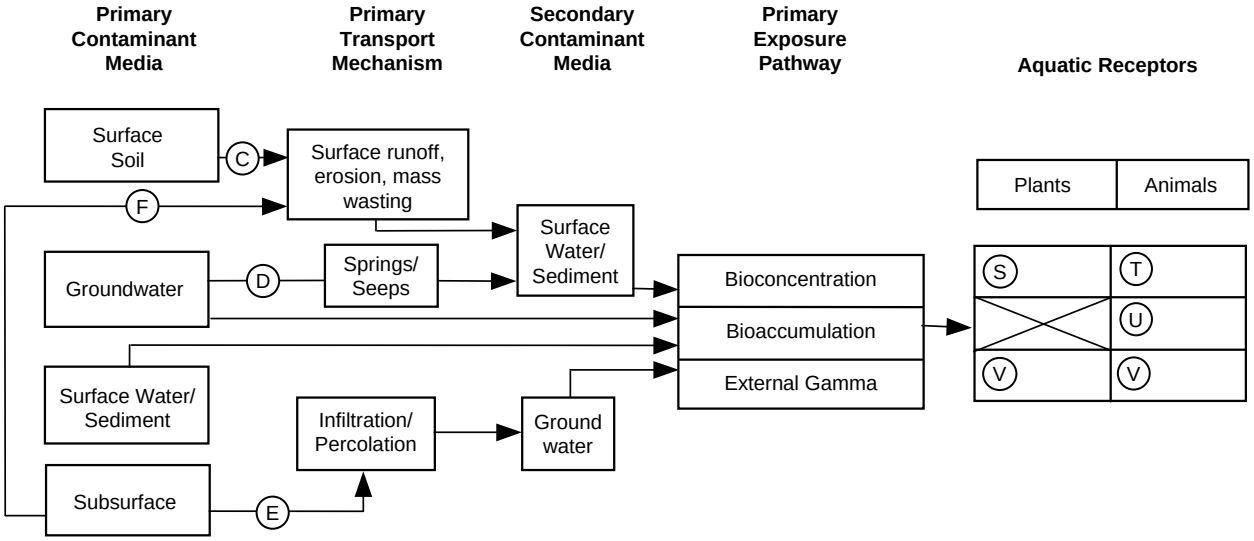
Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the Scoping Checklist



Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the Scoping Checklist



Signatures and certifications:

Checklist completed by (provide name, organization, and phone number):

Name (printed): Kirby Olson, Ph.D.
Name (signature): Kirby S. Olson
Organization: Portage, Inc.
Phone number: 505-662-7600
Date completed: 09/03/2009

Verification by another party (provide name, organization, and phone number):

Name (printed): Richard Mirenda, Ph.D.
Name (signature): Richard Mirenda
Organization: Los Alamos National Laboratory, EP-WES-EDA
Phone number: 505-665-6953

H3-5.0 SWMU 39-007(a) AND AOC 39-007(d)

PART A—SCOPING MEETING DOCUMENTATION

Site ID	SAAs that are not paved or only partially paved: SWMU 39-007(a) and AOC 39-007(d)
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.	SWMU 39-007(a) is a former storage area on concrete pad under covered porch adjacent to equipment shelter 39-63. Used oil containing lead and solvents was stored on pad. Potential release mechanisms include runoff from storage pad and infiltration of material from pad into soil below the pad. Previous sampling identified metals and PCBs as COPCs. AOC 39-007(d) is an active storage area in a bermed asphalt pad covered with a metal roof. Bermed area has a discharge pipe to release storm water across the road. This area stored containers of silicon transformer oil, dielectric fluids, solvents, ethylene glycol, kerosene, etc. The area currently stores cable and wire. There is no previous sampling for this site. Potential release mechanisms for all three sites include spills, runoff to soil from storage area or pad, and infiltration of material from pad into soil below the pad.
List of Primary Impacted Media **(Indicate all that apply.)**	**Surface soil –** yes **Surface water/sediment –**n/a **Subsurface –** yes **Groundwater –** n/a **Other, explain –** none
Vegetation class based on GIS vegetation coverage **(Indicate all that apply.)**	**Water** – **Bare Ground/Unvegetated** – **Spruce/fir/aspen/mixed conifer** – **Ponderosa pine –** **Piñon juniper/juniper savannah** – **Grassland/shrubland** – yes **Developed** – yes **Burned –**
Is T&E Habitat Present? **If applicable, list species known or suspected of using the site for breeding or foraging.**	No, outside of area in the canyon that serves as habitat for Mexican spotted owl.
Provide list, of Neighboring/ Contiguous/ Upgradient sites, includes a brief summary of COPCs and the form of releases for relevant sites and reference a map as appropriate. **(Use this information to evaluate the need to aggregate sites for screening.)**	These sites lie along the canyon bottom in the North Ancho Canyon Aggregate Area. Except for potential migration through the extended drainages, there is no indication of COPC migration between these sites and nearby sites (the sites are not contiguous). Therefore, no sites were aggregated for screening. SWMU 39-004(c), an active firing site, and AOC 39-002(b), an SAA that was not sampled, lie further up the drainage from these sites
Surface Water Erosion Potential Information **Summarize information from SOP 2.01, including the total score and the run-off subscore (maximum of 46); terminal point of surface water transport; slope; and surface water run-on sources.**	At SWMU 39-007(a), the topography slopes up to a burned area of the canyon wall and a small rill across end of the site furthest from the storage area. The rill terminates in a depression next to the road. The asphalted area at AOC 39-007(d) is bermed and roofed, but storm water could collect on soil adjacent to the pad even though the site is in a relatively flat area of the canyon bottom.

PART B—SITE VISIT DOCUMENTATION

Site ID	SWMU 39-007(a) and AOC 39-007(d)
Date of Site Visit	5/07/09
Site Visit Conducted by	Kirby Olson, Ph.D.

Receptor Information:

Estimate cover	**Relative vegetative cover (high, medium, low, none)** = high **Relative wetland cover (high, medium, low, none)** = none **Relative structures/asphalt, etc., cover (high, medium, low, none)** = low
Field notes on the GIS vegetation class to assist in verifying the Arcview information	Apart from the roofed asphalt pad at AOC 39-007(d) and the support building at SWMU 39-007(a), the vegetation at both areas consists of fields with small forbs and grasses around the storage area transitioning to small ponderosas and piñon/juniper trees further from the developed area of the site. Across the driveway from AOC 39-007(d) there is a thick stand of deciduous trees. The terrain around AOC 39-007(d) is flat. The terrain at SWMU 39-007(a) is relatively flat at the site, but to the west slopes upward to the canyon wall. A stand of burned trees covers the canyon wall at that location.
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, both sites provide adequate habitat for small mammals and numerous bird species were heard during the site visit. The high percent vegetation cover around the sites would also make them attractive to larger wildlife such as deer (which have been sighted in the operational area of the canyon). No aquatic communities are present at either site.

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 39-007(d) is in flat terrain on the canyon floor and the asphalt storage area is surrounded by a berm to reduce spills/runoff from the site. SWMU 39-007(a) is slightly sloped and a shallow grass-covered channel runs from the direction of the canyon wall towards the road along the far side of the sight from the storage area (the channel is not adjacent to the storage area itself. There is therefore potential for storm water to run towards the road at SWMU 39-007(a) but not at AOC 39-007(d)
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Yes. At SWMU 39-007(a), there is potential for storm water to run from the canyon wall direction towards the road. However, transport would be limited because the shallow channel is covered with grass and runs across the side of the site distal from the storage area. No pathway to groundwater is likely because it is 550 ft to groundwater. The dense vegetation cover limits air transport of contamination off-site.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	Except for the structures present (building and asphalt pad), there sites appear undisturbed and have intact vegetation.

Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	No.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to off-site 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 the 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 and extent of contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if the maximum value was captured by existing sample data.)**	Yes. The sampling approach in the approved work plan (LANL 2007, 098281) included a sampling grid around and under the asphalt pad at AOC 39-007(d) and alongside the pad and down slope towards the shallow channel at SWMU 39-007(a) to identify the nature and extent of any potential contamination at these sites.
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 be aggregated to characterize potential ecological risk.)**	Yes. The sampling approach in the approved work plan (LANL 2007, 098281) included a sampling grid around and under the asphalt pad at AOC 39-007(d) and alongside the pad and down slope towards the shallow channel at SWMU 39-007(a) to identify potential transport pathways of contamination at these sites.

Additional Field Notes:

Provide additional field notes on the site setting and potential ecological receptors. No additional notes provided.

PART C—ECOLOGICAL PATHWAYS CONCEPTUAL EXPOSURE MODEL

Provide answers to Questions A to V to develop the Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors through vapors?

- **Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant >10^{-5} atm-m^3/mol and molecular weight <200 g/mol).**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: VOCs were detected at trace 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: The dense cover of vegetation at the sites prevent the formation of significant amounts of fugitive dust.

Question C:

Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?

- **If the SOP 2.01 run-off score* for each SWMU and/or AOC included in the site is equal to zero, this suggests that erosion at the site is not a transport pathway. (* note that the runoff score is not the entire erosion potential score, rather it is a subtotal of this score with a maximum value of 46 points).**
- **If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: There are no aquatic communities present.

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 through 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.**
- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: Migration of contamination toward groundwater is very unlikely at these sites because the depth to groundwater is approximately 550 ft, there is little or no soil moisture, and the heavy cover of vegetation increases the evapotransporation rate as well. Also, there are no seeps or springs in North Ancho Canyon.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- **The potential for contaminants to migrate to groundwater.**
- **The potential for contaminants to migrate through 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.**
- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: Migration of contamination toward groundwater is very unlikely at these sites because the depth to groundwater is approximately 550 ft, there is little or no soil moisture, and the heavy cover of vegetation increases the evapotransporation rate as well, further preventing infiltration.

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: The sites are in the bottom of a canyon.

Question G:

Could airborne contaminants interact with receptors through the respiration of vapors?

- **Contaminants must be present as volatiles in the air.**
- **Consider the importance of the inhalation of vapors for burrowing animals.**
- **Foliar uptake of 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: Only trace concentrations of VOCs detected.

Question H:

Could airborne contaminants interact with plants through the deposition of particulates or with animals through the inhalation of fugitive dust?

- **Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.**
- **Exposure through the 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: The dense cover of vegetation at these sites makes formation of significant amounts of dust very unlikely.

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: 3

Provide explanation: Root uptake due to the dense cover of vegetation. The large amount of bare soil limits the exposure through rain splash.

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: 3

Provide explanation: The heavy vegetation covering the open areas of these sites and the high quality surrounding habitat provides food items for foraging animals.

Question K:

Could contaminants interact with receptors through the 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: 3

Provide explanation: Incidental soil ingestion is likely for animals foraging in and around these sites and forage is readily available at both sites.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

- **Significant exposure through 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: Dust levels are reduced by the dense cover of vegetation, even though lipophilic contaminants, such as PCBs are found at the sites.

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 retained as COPECs.

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: No water or sediment is present at these sites.

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: No water or sediment is present at these sites.

Question P:

Could contaminants interact with receptors through the 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: No water or sediment is present at these sites.

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: No water or sediment is present at these sites.

Question R:

Could suspended or sediment-based 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 water or sediment is present at these sites.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: No water or sediment is present at these sites.

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: No water or sediment is present at these sites.

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: No water or sediment is present at these sites.

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; therefore, 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):

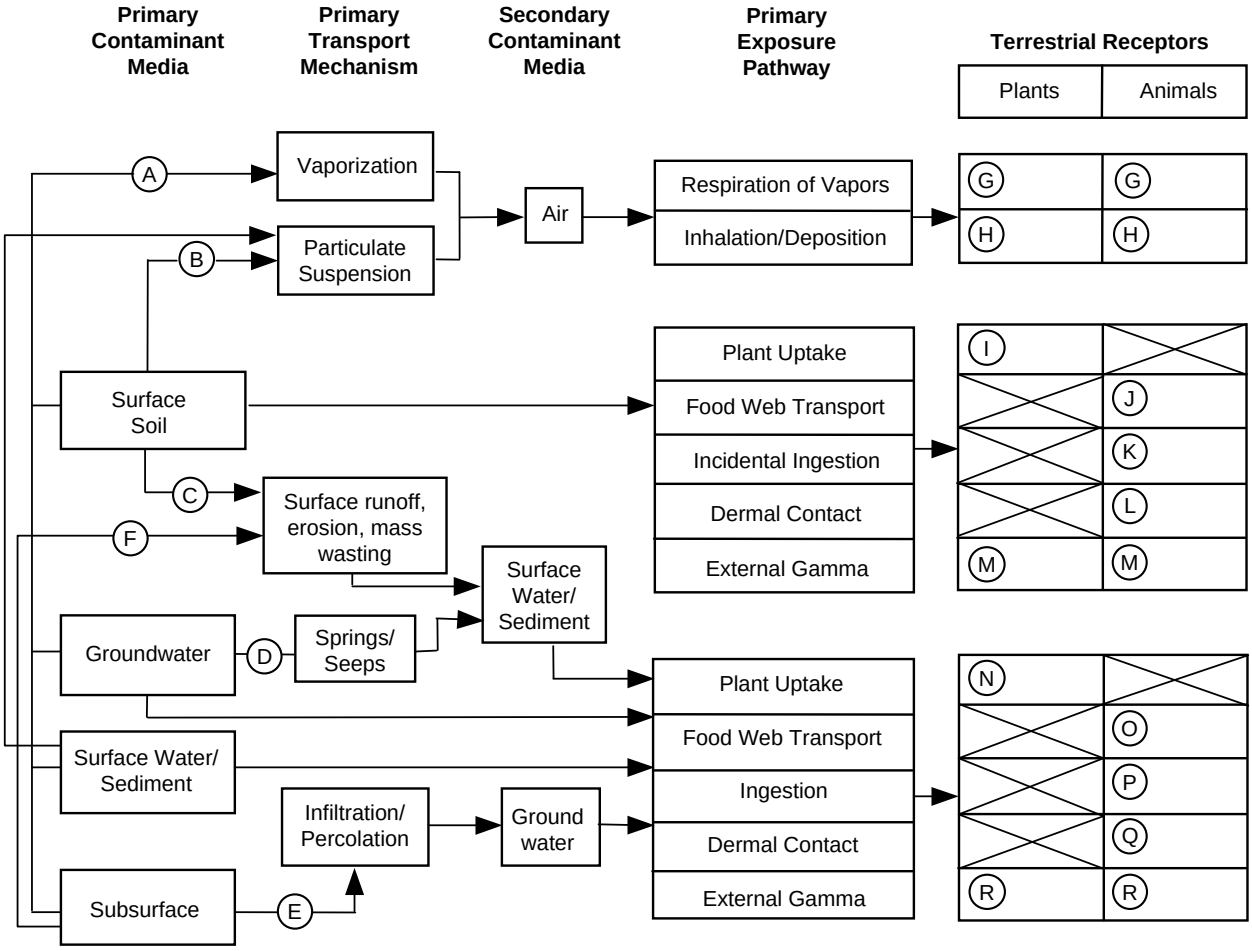
Aquatic Plants: 0

Aquatic Animals: 0

Provide explanation: No water or sediment is present at these sites.

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
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NOTE:
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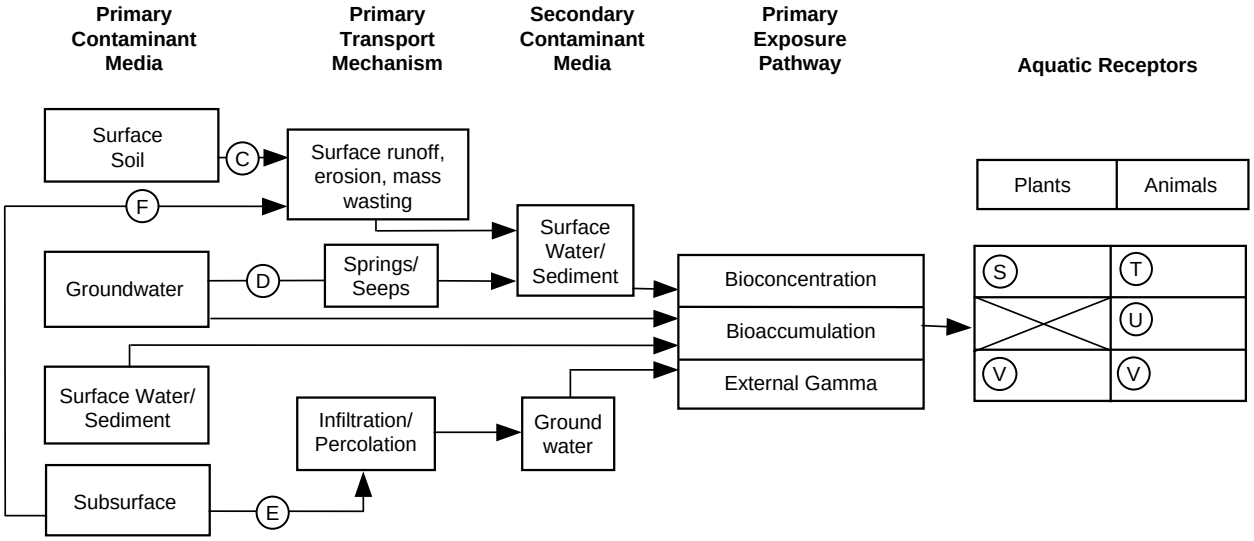


Signatures and certifications:

Checklist completed by (provide name, organization, and phone number):

Name (printed): Kirby Olson, Ph.D.
Name (signature): K. Kirby S. Olson
Organization: Portage, Inc.
Phone number: 505-662-7600
Date completed: 08/09/2009

Verification by another party (provide name, organization, and phone number):

Name (printed): Richard Mirenda, Ph.D.
Name (signature): Richard Mirenda
Organization: Los Alamos National Laboratory, EP-WES-EDA
Phone number: 505-665-6953

H3-6.0 SWMU 39-010

PART A—SCOPING MEETING DOCUMENTATION

Site ID	SWMU 39-010
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.	Area of soil excavated from nearby firing sites. Potential release mechanisms include dispersion of soil contaminants during soil movement as well as runoff from soil in the area to the local drainage channel.
List of Primary Impacted Media **(Indicate all that apply.)**	**Surface soil –** yes **Surface water/sediment –**n/a **Subsurface –** yes **Groundwater –** n/a **Other, explain –** none
Vegetation class based on GIS vegetation coverage **(Indicate all that apply.)**	**Water** – **Bare Ground/Unvegetated** – yes **Spruce/fir/aspen/mixed conifer –** **Ponderosa pine –** yes **Piñon juniper/juniper savannah –** yes **Grassland/shrubland –** yes **Developed –** **Burned –**
Is T&E Habitat Present? **If applicable, list species known or suspected of using the site for breeding or foraging.**	No, outside of area in the canyon that serves as habitat for Mexican spotted owl.
Provide list, of Neighboring/ Contiguous/ Upgradient sites, includes a brief summary of COPCs and the form of releases for relevant sites and reference a map as appropriate. **(Use this information to evaluate the need to aggregate sites for screening.)**	This site lies near in the wide part of the canyon bottom adjacent to the extended drainages. There is no indication of COPC migration between this site and upgradient sites, which are at least 1000 ft up the canyon. The drainage channel does not cross SWMU 39-010.
Surface Water Erosion Potential Information **Summarize information from SOP 2.01, including the total score and the run-off subscore (maximum of 46); terminal point of surface water transport; slope; and surface water run-on sources.**	The site is a hummocky area completely covered with vegetation (including large shrubs and small trees). A large, flat grass field lies between SWMU 39-010 and the channel for the extended drainages. There was no visible evidence of run-on or runoff at this site. The potential for surface water transport is therefore low for this site.

PART B—SITE VISIT DOCUMENTATION

Site ID	SWMU 39-010
Date of Site Visit	5/07/2009
Site Visit Conducted by	Kirby Olson, Ph.D.

Receptor Information:

Estimate cover	**Relative vegetative cover (high, medium, low, none)** = high **Relative wetland cover (high, medium, low, none)** = none **Relative structures/asphalt, etc., cover (high, medium, low, none)** = none
Field notes on the GIS vegetation class to assist in verifying the Arcview information	The soil dump area is completely covered with vegetation. The primary cover is small forbs and grass, but large shrubs with berries and small tress are also growing on the site. The area next to the site (between the site and the drainage channel) is a flat grass field ending in a line of ponderosa pines along the channel for the drainage.
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.**	Terrestrial receptors including small mammals and birds could use this site for both foraging and nesting. Several species of birds were heard and seen during the site visit. The area contains numerous burrows (the burrow occupants were not seen during the visit, but are likely to be small animals based on the size of the burrow openings). Large boulders surrounded by vegetation are also found across the site, providing additional habitat. The soil dump at 39-010 is also located away from the operational areas, increasing its attractiveness to ecological receptors. A great horned owl was seen at this site on a different day by a survey crew.

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).**	No evidence of surface water runoff at the site was seen during the site visit. The ground is uneven but does not slope in any direction, probably preventing formation of run-off channels.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	No evidence of surface water runoff at the site was seen during the site visit; therefore, it is believed that no off-site surface water transport pathways cross SWMU 39-010. No pathway to groundwater is likely because it is 550 ft to groundwater. The dense vegetation cover limits air transport of contamination off-site.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	The area was previously disturbed during its construction prior to 1993. Currently, the site appears undisturbed, having been colonized by plants and wildlife receptors.

Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	No, the site has become compete overgrown with apparently healthy, lush, and varied vegetation and numerous ecological receptors (insects and birds) were seen during the site visit. Evidence of small mammals (burrows) was also seen.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to off-site 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 the 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 and extent of contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if the maximum value was captured by existing sample data.)**	Yes. The sampling approach in the approved work plan (LANL 2007, 098281) included a sampling grid over the entire soil dump area to a depth of 3 ft to identify the nature and extent of any potential contamination at SWMU 39-010
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 be aggregated to characterize potential ecological risk.)**	Yes. The sampling approach in the approved work plan (LANL 2007, 098281) included a sampling grid over the entire soil dump area to a depth of 3 ft to address potential transport pathways of contamination at SWMU 39-010.

Additional Field Notes:

Provide additional field notes on the site setting and potential ecological receptors. No additional notes are provided

PART C—ECOLOGICAL PATHWAYS CONCEPTUAL EXPOSURE MODEL

Provide answers to Questions A to V to develop the Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors through vapors?

- **Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant >10^{-5} atm-m^3/mol and molecular weight <200 g/mol).**

Answer (likely/unlikely/uncertain): unlikely.

Provide explanation: VOCs detected infrequently and at trace 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: The site is covered with dense vegetation, which limits the amount of dust that could be generated.

Question C:

Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?

- **If the SOP 2.01 run-off score* for each SWMU and/or AOC included in the site is equal to zero, this suggests that erosion at the site is not a transport pathway. (* note that the runoff score is not the entire erosion potential score, rather it is a subtotal of this score with a maximum value of 46 points).**
- **If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: No aquatic communities are present at the site. There are no pathways to off-site aquatic communities from the site.

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 through 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.**
- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: Depth to regional groundwater is approximately 550 ft. There are no seeps, springs, or shallow groundwater in the area.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- **The potential for contaminants to migrate to groundwater.**
- **The potential for contaminants to migrate through 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.**
- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: Depth to regional groundwater is approximately 550 ft. There are no seeps, springs, or shallow groundwater in the area.

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: Site is in the canyon bottom.

Question G:

Could airborne contaminants interact with receptors through the respiration of vapors?

- **Contaminants must be present as volatiles in the air.**
- **Consider the importance of the inhalation of vapors for burrowing animals.**
- **Foliar uptake of 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: VOCs detected infrequently and at trace concentrations.

Question H:

Could airborne contaminants interact with plants through the deposition of particulates or with animals through the inhalation of fugitive dust?

- **Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.**
- **Exposure through the 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: The site is heavily vegetated, which mitigates the formation of 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: 3

Provide explanation: The site is completely covered with vegetation. Root uptake into plants is very likely for some contaminants. Rain splash is a much less likely pathway due to the density of the plant cover.

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: 3

Provide explanation: The site is completely covered with vegetation, including a number of bushes bearing berries. Ingestion of food items is likely for animals, particularly as the site also provides shelter due to the tree, grass, and boulder cover.

Question K:

Could contaminants interact with receptors through the 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: 3

Provide explanation: This is a major pathway as the site provides forage (so soil may be ingested with food items) and shelter. Burrows are found throughout the site; incidental soil ingestion is even higher for burrowing animals.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

- **Significant exposure through 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: Exposure via dermal contact is possible for animals, but is a minor pathway because of the trace concentrations of organic chemicals detected in soil and tuff at the 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: 2

Provide explanation: Cesium-137 was detected infrequently in soil in the 0-2 ft bgs depth and there are burrowing animals at the site.

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: No water or sediment is found at the site.

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: No water or sediment is found at the site.

Question P:

Could contaminants interact with receptors through the 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: No water or sediment is found at the site. The soil is unlikely to retain storm water long enough to act as a drinking water source.

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: No water or sediment is found at this site.

Question R:

Could suspended or sediment-based 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 sediment is found at this site.

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: No aquatic communities are found at this site.

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: No aquatic communities are found at this site.

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: no aquatic communities are found at this site.

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; therefore, 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):

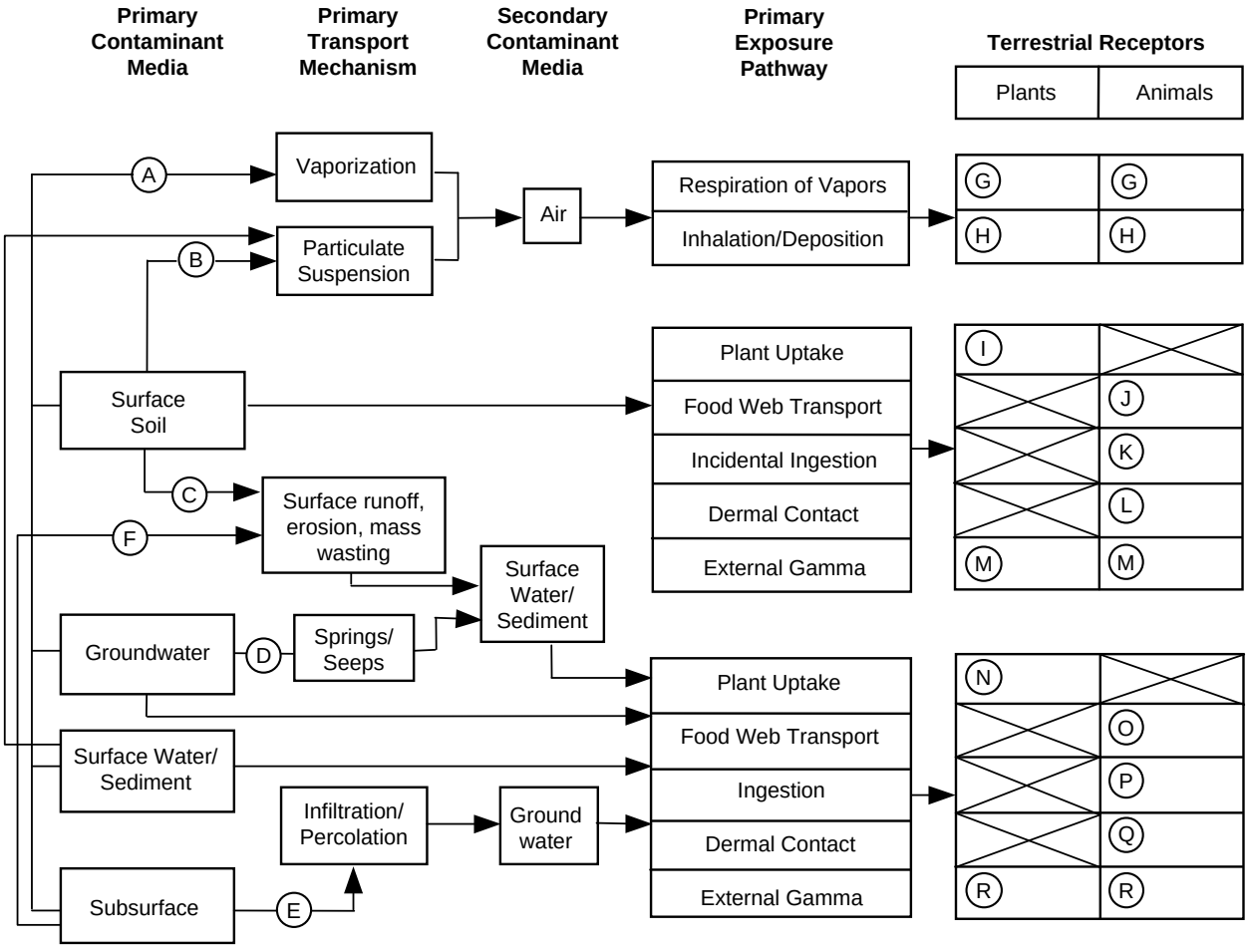
Aquatic Plants: 0

Aquatic Animals: 0

Provide explanation: No aquatic communities are found at this site.

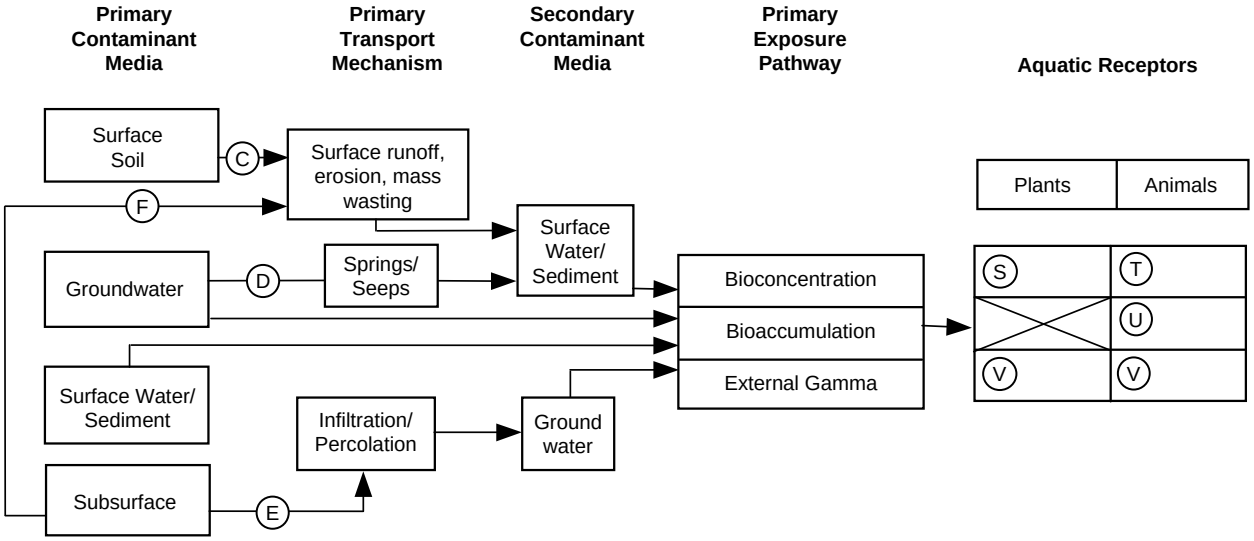
Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the Scoping Checklist



Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the Scoping Checklist



Signatures and certifications:

Checklist completed by (provide name, organization, and phone number):

Name (printed): Kirby Olson, Ph.D.
Name (signature): Kirby S. Olson
Organization: Portage, Inc.
Phone number: 505-662-7600
Date completed: 08/08/2009

Verification by another party (provide name, organization, and phone number):

Name (printed): Richard Mirenda, Ph.D.
Name (signature): Richard Mirenda
Organization: Los Alamos National Laboratory, EP-WES-EDA
Phone number: 505-665-6953

H3-7.0 EXTENDED DRAINAGES

PART A—SCOPING MEETING DOCUMENTATION

Site ID	Extended drainages
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.	Ephemeral drainage running down North Ancho Canyon near the SWMUs and AOCs under investigation. Sections sampled include the northwest end (both forks), both forks of the central confluence between the main channel and its tributary, as well as the entire length of the drainage from SWMU 39-005 south and across the highway. Potential release mechanisms include runoff from sites adjacent to channel or its tributaries, and transport of contaminants in sediment and debris washed down the channel during rain/flood events.
List of Primary Impacted Media **(Indicate all that apply.)**	**Surface soil –** yes **Surface water/sediment –**yes (sediment) **Subsurface –** yes **Groundwater –** n/a **Other, explain –** none
Vegetation class based on GIS vegetation coverage **(Indicate all that apply.)**	**Water** – **Bare Ground/Unvegetated –** yes **Spruce/fir/aspen/mixed conifer –** **Ponderosa pine –** yes **Piñon juniper/juniper savannah –** yes **Grassland/shrubland –** yes **Developed –** yes **Burned –**
Is T&E Habitat Present? **If applicable, list species known or suspected of using the site for breeding or foraging.**	No, this drainage lies outside the Mexican spotted owl habitat.
Provide list, of Neighboring/ Contiguous/ Upgradient sites, includes a brief summary of COPCs and the form of releases for relevant sites and reference a map as appropriate. **(Use this information to evaluate the need to aggregate sites for screening.)**	The extended drainages is investigated because it is a potential pathway for migration of contamination from all the SWMUs and AOCs in the North Ancho Canyon Aggregate Area.
Surface Water Erosion Potential Information **Summarize information from SOP 2.01, including the total score and the run-off subscore (maximum of 46); terminal point of surface water transport; slope; and surface water run-on sources.**	The extended drainages are a surface water channel running northwest to southeast through the length of North Ancho Canyon. The channel is ephemeral, carrying water only briefly during intense summer rainfall. When the channel does briefly carry storm water, the water contains large amounts of sediment and (during rare food events) large amounts of debris as well. The surface erosion potential is very high during these rare events, and is the basis for investigating the drainages as a potential pathway for migration of contamination.

PART B—SITE VISIT DOCUMENTATION

Site ID	Extended Drainages
Date of Site Visit	5/07/2009
Site Visit Conducted by	Kirby Olson, Ph.D.

Receptor Information:

Estimate cover	**Relative vegetative cover (high, medium, low, none)** = high at banks, none in channel **Relative wetland cover (high, medium, low, none)** = none **Relative structures/asphalt, etc., cover (high, medium, low, none)** = none
Field notes on the GIS vegetation class to assist in verifying the Arcview information	The vegetation and character of the drainage varies as it moves from the head of the canyon to State Highway 4.
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, terrestrial receptors are present along the banks for the length of the drainage and frequently cross it or travel up and down the length of the channel (based on footprints in the channel bottom). No aquatic receptors are found in the drainage because it is too dry to support any aquatic life, and the flow during heavy rain events and floods scours the channel, preventing aquatic ecosystems from establishing there. Therefore, sediment was evaluated only for exposures to terrestrial 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).**	The extended drainages are a surface water channel running northwest to southeast through the length of North Ancho Canyon. The channel is ephemeral, carrying water only briefly during intense summer rainfall. When the channel does briefly carry storm water, the water contains large amounts of sediment and (during rare food events) large amounts of debris as well. The surface erosion potential is very high during these rare events,
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Yes, the channel transports sediment in storm water during heavy rain events. Because the channel has a sandy bottom, it is possible that wind-blown dust during wind events could transport dust and soil off-site. The pathway to groundwater is unlikely because the depth to groundwater is 550 ft and the presence of water in the channel is extremely ephemeral.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	Erosion from previous storm water events is the only disturbance seen in the channel.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	The channel bottom is free of vegetation due to scouring during storm events.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to off-site 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 the 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 and extent of contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if the maximum value was captured by existing sample data.)**	Yes. The sampling done in 2009 collected approximately 300 soil and sediment samples. The sampling area covered both banks and the center of the channel in the northwest end of the drainage, the central part of the drainage, and the lower part of the drainage including across State Highway 4 where the drainage channel leaves the North Ancho Canyon Aggregate Area. These samples were collected at two depths and are adequate to assess the nature and extent of contamination throughout the extended drainages.
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 be aggregated to characterize potential ecological risk.)**	Yes. The sampling done in 2009 collected approximately 300 soil and sediment samples. The sampling area covered both banks and the center of the channel in the northwest end of the drainage, the central part of the drainage, and the lower part of the drainage including across State Highway 4 where the drainage channel leaves the North Ancho Canyon Aggregate Area. These samples were collected at two depths and are adequate to assess the potential for migration of contamination throughout the extended drainages.

Additional Field Notes:

Provide additional field notes on the site setting and potential ecological receptors.

The physical character of the extended drainages channel and the ecological setting around the channel changes as the channel traverses the canyon from northwest to southeast. Therefore the site was visited at several locations. The narrative of the site visit is presented here, going from the head of the channel (northwest end of canyon) towards the end of the channel at State Highway 4 (southeast end of canyon).

At the northwest end of the canyon near SWMU 39-004(d) firing site, the channel is narrow with a rocky bottom. The surrounding ecological setting is steep, rocky slopes of tuff boulders with sparse forbs and shrubs.

Further down towards the middle of the canyon by SWMU 39-010 and SWMU 39-001(b), the channel is wide, shallow (incised about 1 ft) with a sandy bottom, and flat grassy banks on both sides.

A little further down in the vicinity of SWMU 39-001(a) the channel is still wide with a sandy bottom, but the grassy banks are now lined with ponderosa pines. On the side of the channel nearest the road, the bank becomes steeper and a few feet higher. In some spots, this bank has been reinforced with wire mesh or with gabions of rock to prevent erosion.

Just before State Highway 4, near SWMU 39-006(a) the channel reaches its widest and has the least distinct banks. Once the channel crosses the under the highway it becomes a shallow depression in a wide grassy meadow flanked by grassy slopes with ponderosa pines.

PART C—ECOLOGICAL PATHWAYS CONCEPTUAL EXPOSURE MODEL

Provide answers to Questions A to V to develop the Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors through vapors?

- **Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant >10^{-5} atm-m^3/mol and molecular weight <200 g/mol).**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: Only a few VOCs were detected infrequently and at trace 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: Soil and sediment in the sandy channel bottom is likely subject to suspension during wind events, though the large grain size limits the amount transported.

Question C:

Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?

- **If the SOP 2.01 run-off score* for each SWMU and/or AOC included in the site is equal to zero, this suggests that erosion at the site is not a transport pathway. (* note that the runoff score is not the entire erosion potential score, rather it is a subtotal of this score with a maximum value of 46 points).**
- **If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: There are no aquatic communities in this highly ephemeral channel, nor are there likely to be any aquatic receptors off-site that are reached by the storm water flow.

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 through 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.**
- **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, springs, or shallow groundwater in North Ancho Canyon.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- **The potential for contaminants to migrate to groundwater.**
- **The potential for contaminants to migrate through 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.**
- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): unlikely

Provide explanation: The storm water flow is primarily an intense short term flow that is unlikely to reach groundwater (depth to groundwater is approximately 550 ft in North Ancho Canyon).

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: Site is in the bottom of the canyon.

Question G:

Could airborne contaminants interact with receptors through the respiration of vapors?

- **Contaminants must be present as volatiles in the air.**
- **Consider the importance of the inhalation of vapors for burrowing animals.**
- **Foliar uptake of 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: 0

Terrestrial Animals: 1

Provide explanation: Only a few VOCs were detected infrequently and in trace amounts. Also, there are no plants within the channel.

Question H:

Could airborne contaminants interact with plants through the deposition of particulates or with animals through the inhalation of fugitive dust?

- **Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.**
- **Exposure through the 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: 0

Terrestrial Animals: 1

Provide explanation: There are no plants within the channel. Animals traversing the channel could be exposed if sufficient dust was suspended.

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: Plants lining the banks may have roots in the channel and may take up water from the channel bottom after rain events. During flooding soil and sediment may be deposited on leaves.

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: 1

Provide explanation: This exposure is unlikely because the channel contains essentially no food items.

Question K:

Could contaminants interact with receptors through the 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: Terrestrial animals could ingest soil while traversing the channel.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

- **Significant exposure through 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: 1

Provide explanation: The channel is bare soil/sediment and is not good habitat.

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 retained as COPECs.

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: 2

Provide explanation: Sediment could be deposited on plants during storm water events. These events are extremely infrequent.

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: 1

Provide explanation: Terrestrial animals are unlikely to find food items in the drainage channel, but contaminants in sediment could be taken up by plants on the channel banks.

Question P:

Could contaminants interact with receptors through the 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: 1

Provide explanation: Could occur during or immediately after a storm water event. However, these events are very infrequent and water remains in the channel for only a short period of time afterwards, so it is unlikely animals would be using it as a significant source of drinking water.

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: 2

Provide explanation: Dermal exposure is possible, but is an insignificant exposure for ecological receptors.

Question R:

Could suspended or sediment-based 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 retained as COPECs.

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 communities in the extended drainages because the water is ephemeral.

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 communities in the extended drainages because the water is ephemeral.

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 communities in the extended drainages because the water is ephemeral.

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; therefore, 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):

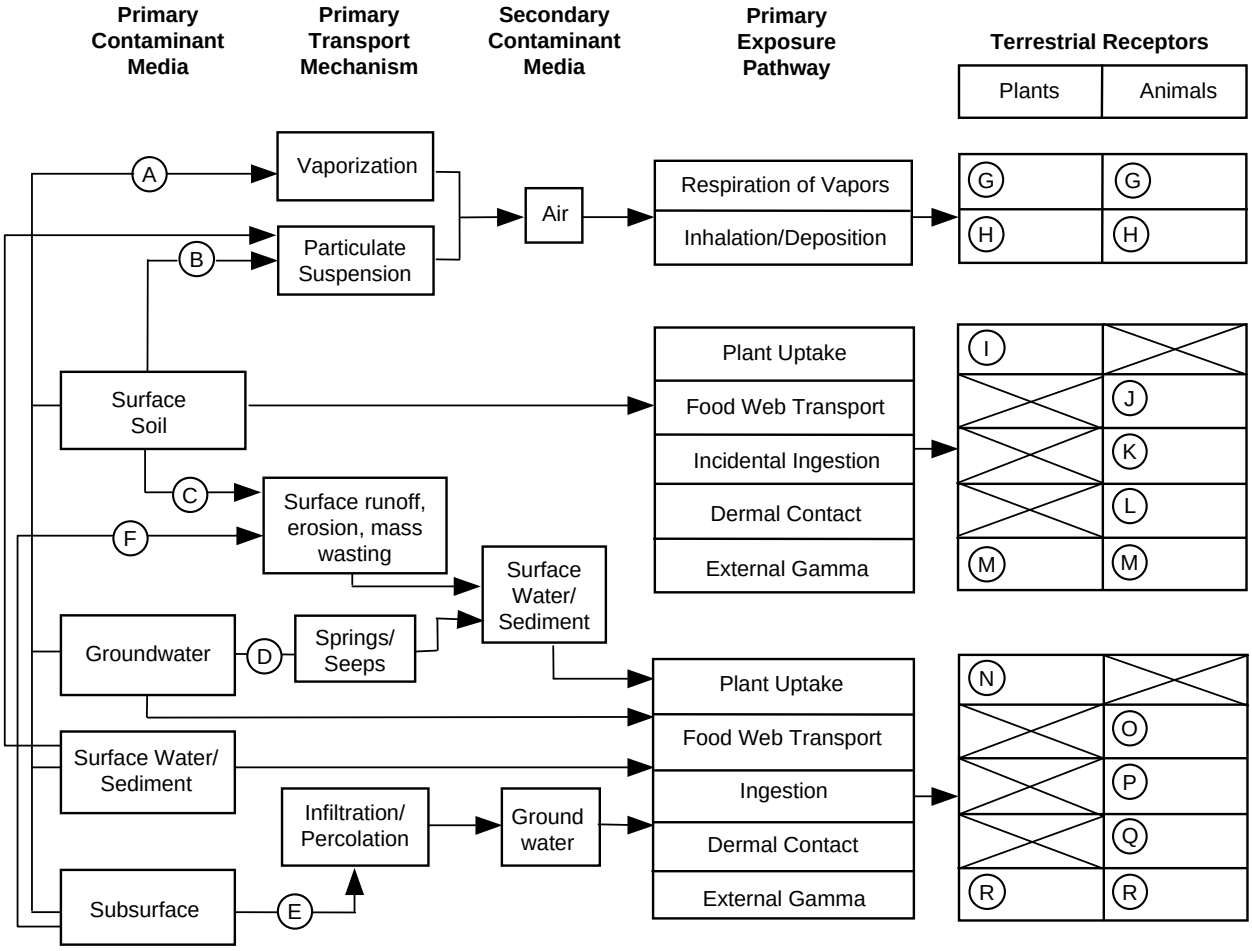
Aquatic Plants: 0

Aquatic Animals: 0

Provide explanation: There are no aquatic communities in the extended drainages because the water is ephemeral.

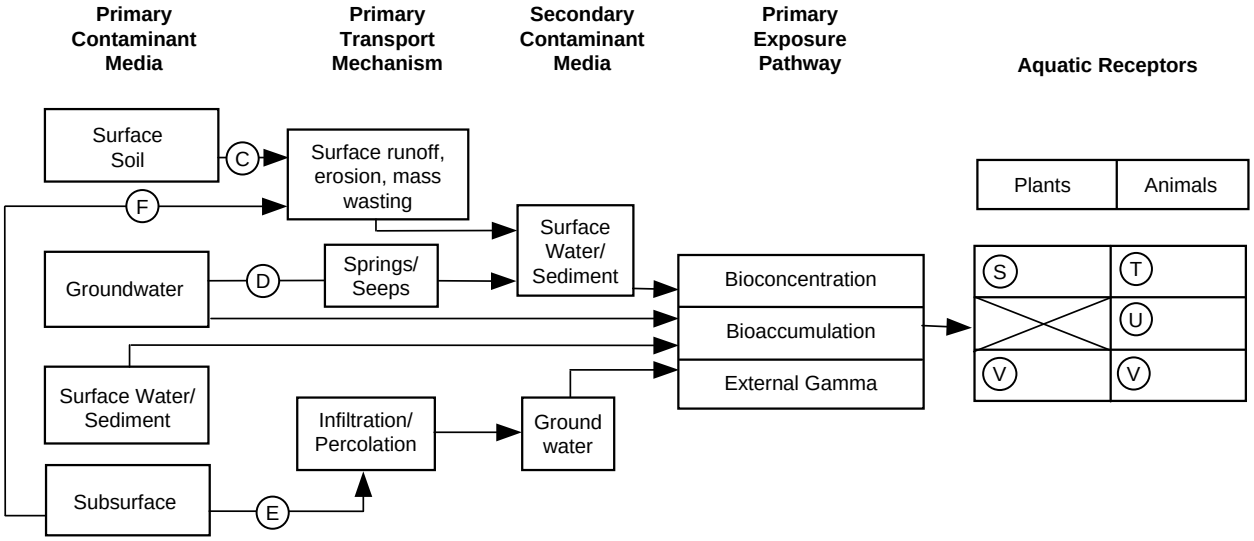
Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the Scoping Checklist



Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the Scoping Checklist



Signatures and certifications:

Checklist completed by (provide name, organization, and phone number):

Name (printed): Kirby Olson, Ph.D.
Name (signature): Kirby S. Olson
Organization: Portage, Inc.
Phone number: 505-662-7600
Date completed: 08/09/2009

Verification by another party (provide name, organization, and phone number):

Name (printed): Richard Mirenda, Ph.D.
Name (signature): Richard Mirenda
Organization: Los Alamos National Laboratory, EP-WES-EDA
Phone number: 505-665-6953