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Investigation Report for DP Site Aggregate Area Delayed Sites [Consolidated Unit 21-004(b)-99 and Solid Waste Management Unit 21-011(b)] and DP East Building Footprints at Technical Area 21

Prepared by the Environmental Programs Directorate

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December 2011

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EXECUTIVE SUMMARY

This investigation report presents the investigation activities at six sites within the DP Site Aggregate Area at Los Alamos National Laboratory (LANL or the Laboratory). The sites are located in Technical Area 21 (TA-21) and include the following:

- Consolidated Unit 21-004(b)-99, former aboveground storage tanks and former outfall
- Solid Waste Management Unit (SWMU) 21-011(b), acid waste lines and former sump
- Former building 21-152 footprint and associated former structures footprints
- Former building 21-155 footprint and associated former structures footprints
- Former building 21-209 footprint and associated structure 21-466 footprint
- Area of Concern (AOC) 21-028(d), former loading dock at former building 21-209

Buildings 21-152, 21-155, and 21-209 were connected to various SWMUs, AOCs, and consolidated units at DP East and are part of the DP Site Aggregate Area. The objectives of this investigation were to define the nature and extent of contamination and, if defined, to determine whether the sites pose a potential unacceptable risk/dose to human health or the environment as well as to assess whether additional sampling is required. This report presents the results of site characterization activities conducted during the 2010–2011 investigation, as directed by the approved investigation work plans for the DP Site Aggregate Area Delayed Sites and DP East Building Footprints.

The 2010–2011 investigation activities included collecting soil and tuff samples from the surface to a maximum depth of 31 ft below ground surface. The sampling data presented in this report indicate the extent of contamination has not been defined at any of the sites. Therefore, chemicals of potential concern were not identified at the sites, and no human health and ecological risk-screening assessments were performed.

Additional sampling is needed to define the vertical and/or lateral extent at each of these sites. The Laboratory will provide a Phase II investigation work plan to address the additional sampling required to complete characterization at these sites. Once additional data are available and extent is defined, human health and ecological risk-screening assessments will be conducted to determine if the sites pose potential unacceptable risk/dose to human health and the environment.

CONTENTS

1.0 INTRODUCTION 1
1.1 General Site Information 2
1.2 Purpose of Investigation 2
1.3 Brief Scope of Investigation 2
1.4 Document Organization 2

2.0 BACKGROUND 3
2.1 TA-21 3
2.2 Consolidated Unit 21-004(b)-99, Aboveground Storage Tanks and Former Outfall 3
2.2.1 Site Description and Operational History 3
2.2.2 Relationship to Other SWMUs and AOCs 4
2.2.3 Summary of Releases 4
2.2.4 Previous Investigations 4
2.2.5 Historical Nature and Extent of Contamination 4
2.3 SWMU 21-011(b), Acid Waste Lines and Sump 4
2.3.1 Site Description and Operational History 4
2.3.2 Relationship to Other SWMUs and AOCs 5
2.3.3 Summary of Releases 5
2.3.4 Previous Investigations 5
2.3.5 Historical Nature and Extent of Contamination 5
2.4 Former Building 21-152 and Associated Former Structures Footprints 5
2.4.1 Site Description and Operational History 5
2.4.2 Relationship to Other SWMUs and AOCs 6
2.4.3 Summary of Releases 6
2.4.4 Previous Investigations 7
2.4.5 Historical Nature and Extent of Contamination 7
2.5 Former Building 21-155 and Associated Former Structures Footprints 7
2.5.1 Site Description and Operational History 7
2.5.2 Relationship to Other SWMUs and AOCs 7
2.5.3 Summary of Releases 7
2.5.4 Previous Investigations 8
2.5.5 Historical Site Nature and Extent of Contamination 8
2.6 Former Building 21-209 and Associated Former Structure 21-466 Footprints 8
2.6.1 Site Description and Operational History 8
2.6.2 Relationship to Other SWMUs and AOCs 8
2.6.3 Summary of Releases 8
2.6.4 Previous Investigations 8
2.6.5 Historical Nature and Extent of Contamination 9
2.7 AOC 21-028(d), Former Loading Dock 9
2.7.1 Site Description and Operational History 9
2.7.2 Relationship to Other SWMUs and AOCs 9
2.7.3 Summary of Releases 9
2.7.4 Previous Investigations 9
2.7.5 Historical Nature and Extent of Contamination 9

3.0 SITE CONDITIONS 10
3.1 Surface Conditions 10
3.1.1 Soil 10
3.1.2 Surface Water 10
3.1.3 Land Use 10
3.2 Subsurface Conditions 11
3.2.1 Stratigraphy 11
3.2.2 Hydrogeology 14

4.0 FIELD INVESTIGATION ACTIVITIES 15
4.1 Site Access and Premobilization 15
4.2 Field Activities 16
4.2.1 Geodetic Survey 16
4.2.2 Field Screening 16
4.2.3 Radiological Survey Results 16
4.2.4 Sample Management 17
4.2.5 Borehole Abandonment 17
4.2.6 Excavations 17
4.2.7 Equipment Decontamination 19
4.2.8 Sample Analyses 19
4.2.9 Health and Safety 19
4.2.10 IDW Management 19
4.3 Deviations 20

5.0 DATA REVIEW PROCESS 21
5.1 Nature and Extent Determination Methodology 21
5.2 Identification of COPCs 22

6.0 REGULATORY CRITERIA 22
6.1 Current and Future Land Use 22
6.2 Risk-Screening Assessments 23
6.2.1 Human Health Screening Assessments 23
6.2.2 Ecological Screening Assessments 23
6.3 Cleanup Standards 23

7.0 SITE CONTAMINATION 23
7.1 Overview of Data 24
7.1.1 Consolidated Unit 21-004(b)-99, Aboveground Storage Tanks and Former Outfall 24
7.1.2 SWMU 21-011(b), Acid Waste Lines and Sump 28
7.1.3 Former Building 21-152 and Associated Former Structures Footprints 33
7.1.4 Former Building 21-155 and Associated Former Structures Footprints 40
7.1.5 Former Building 21-209 and Associated Former Structure 21-466 Footprints 46
7.1.6 AOC 21-028(d), Former Loading Dock 51

8.0 CONCLUSIONS 55
8.1 Nature and Extent of Contamination 55
8.2 Summary of Risk-Screening Assessments 56
8.2.1 Human Health 56
8.2.2 Ecological 56

9.0 RECOMMENDATIONS 56
Schedule for Recommended Activities 57

10.0 REFERENCES AND MAP DATA SOURCES 57
10.1 References 57
10.2 Map Data Sources 63

Figures

Figure 1.0-1 Location of TA-21 with respect to surrounding land holdings 67
Figure 1.0-2 DP Site Aggregate Area sites addressed in this report 68
Figure 2.2-1 Consolidated Unit 21-004(b)-99 aboveground storage tanks and former outfall site map with sampling locations 69
Figure 2.3-1 SWMU 21-011(b) acid waste lines and sump site map with sampling locations 70
Figure 2.4-1 Former building 21-152 and associated former structures footprints site map with sampling locations 71
Figure 2.5-1 Former building 21-155 and associated former structures footprints site map with sampling locations 72
Figure 2.6-1 Former building 21-209 and associated former structure 21-466 footprints site map with sampling locations 73
Figure 2.7-1 AOC 21-028(d) former loading dock site map with sampling locations 74
Figure 3.2-1 General stratigraphy beneath TA-21 75
Figure 3.2-2 Groundwater monitoring wells in the vicinity of TA-21 76
Figure 7.1-1 Inorganic chemicals detected or detected above BVs at Consolidated Unit 21-004(b)-99 77
Figure 7.1-2 Organic chemicals detected at Consolidated Unit 21-004(b)-99 78
Figure 7.1-3 Radionuclides detected or detected above BVs/FVs at Consolidated Unit 21-004(b)-99 79
Figure 7.1-4 Inorganic chemicals detected or detected above BVs at former building 21-209 and associated former structure 21-466 footprints 80
Figure 7.1-5 Radionuclides detected or detected above BVs/FVs at former building 21-209 and associated former structure 21-466 footprints 81
Figure 7.1-6 Inorganic chemicals detected or detected above BVs at AOC 21-028(d) 82
Figure 7.1-7 Organic chemicals detected at AOC 21-028(d) 83
Figure 7.1-8 Radionuclides detected or detected above BVs/FVs at AOC 21-028(d) 84

Tables

Table 1.3-1 DP Site Aggregate Delayed Sites and DP East Building Footprints under Investigation 85
Table 4.2-1 Surveyed Coordinates and Corresponding Work Plan Locations for Locations Sampled 86
Table 4.2-2 Field-Screening Results for Samples Collected 93
Table 4.2-3 Coordinates of Piping and Structures Left in Place 102

Table 7.1-1 Samples Collected and Analyses Requested at Consolidated Unit 21-004(b)-99 103
Table 7.1-2 Inorganic Chemicals above BVs at Consolidated Unit 21-004(b)-99 104
Table 7.1-3 Organic Chemicals Detected at Consolidated Unit 21-004(b)-99.................................. 105
Table 7.1-4 Radionuclides Detected or Detected above BVs/FVs at Consolidated Unit 21-004(b)-99 108
Table 7.1-5 Samples Collected and Analyses Requested at SWMU 21-011(b)............................... 109
Table 7.1-6 Inorganic Chemicals above BVs at SWMU 21-011(b).. 111
Table 7.1-7 Organic Chemicals Detected at SWMU 21-011(b) 115
Table 7.1-8 Radionuclides Detected or Detected above BVs/FVs at SWMU 21-011(b) 121
Table 7.1-9 Samples Collected at Former Building 21-152 and Associated Former Structures Footprints 123
Table 7.1-10 Inorganic Chemicals above BVs at Former Building 21-152 and Associated Former Structures Footprints... 127
Table 7.1-11 Organic Chemicals Detected at Former Building 21-152 and Associated Former Structures Footprints... 136
Table 7.1-12 Radionuclides Detected or Detected above BVs/FVs at Former Building 21-152 and Associated Former Structures Footprints 155
Table 7.1-13 Samples Collected and Analyses Requested at Former Building 21-155 and Associated Former Structures Footprints 161
Table 7.1-14 Inorganic Chemicals above BVs at Former Building 21-155 and Associated Former Structures Footprints... 164
Table 7.1-15 Organic Chemicals Detected at Former Building 21-155 and Associated Former Structures Footprints... 168
Table 7.1-16 Radionuclides Detected or Detected above BVs/FVs at Former Building 21-155 and Associated Former Structures Footprints 179
Table 7.1-17 Samples Collected and Analyses Requested at Former Building 21-209 and Associated Former Structure 21-466 Footprints.. 183
Table 7.1-18 Inorganic Chemicals above BVs at Former Building 21-209 and Associated Former Structure 21-466 Footprints 185
Table 7.1-19 Organic Chemicals Detected at Former Building 21-209 and Associated Former Structure 21-466 Footprints 189
Table 7.1-20 Radionuclides Detected or Detected above BVs/FVs at Former Building 21-209 and Associated Former Structure 21-466 Footprints.. 197
Table 7.1-21 Samples Collected and Analyses Requested at AOC 21-028(d) 199
Table 7.1-22 Inorganic Chemicals above BVs at AOC 21-028(d) 200
Table 7.1-23 Organic Chemicals Detected at AOC 21-028(d).. 201
Table 7.1-24 Radionuclides Detected or Detected above BVs/FVs at AOC 21-028(d)....................... 203

Appendixes

Appendix A	Acronyms and Abbreviations, Metric Conversion Table, and Data Qualifier Definitions
Appendix B	Field Methods
Appendix C	Analytical Suites and Results and Analytical Reports (on DVD included with this document)
Appendix D	Radiological Surveys
Appendix E	Investigation-Derived Waste Management
Appendix F	Analytical Program

Plates

Plate 1	Inorganic chemicals detected or detected above BVs at SWMU 21-011(b)
Plate 2	Organic chemicals detected at SWMU 21-011(b)
Plate 3	Radionuclides detected or detected above BVs/FVs at SWMU 21-011(b)
Plate 4	Inorganic chemicals detected or detected above BVs at former building 21-152 and associated former structures footprints
Plate 5	Organic chemicals detected at former building 21-152 and associated former structures footprints
Plate 6	Radionuclides detected or detected above BVs/FVs at former building 21-152 and associated former structures footprints
Plate 7	Inorganic chemicals detected or detected above BVs at former building 21-155 and associated former structures footprints
Plate 8	Organic chemicals detected at former building 21-155 and associated former structures footprints
Plate 9	Radionuclides detected or detected above BVs/FVs at former building 21-155 and associated former structures footprints
Plate 10	Organic chemicals detected at former building 21-209 and associated former structure 21-466 footprints

1.0 INTRODUCTION

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

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

This investigation report presents the results of the 2010–2011 investigation of the DP Site Aggregate Area Delayed Sites and DP East building footprints at the Laboratory located within Technical Area 21 (TA-21) (Figure 1.0-1). The sites subject to this investigation (Figure 1.0-2) are situated within the DP Site Aggregate Area and were potentially contaminated with both hazardous and radioactive components. These sites include the following:

- Consolidated Unit 21-004(b)-99, former aboveground storage tanks and former outfall
- SWMU 21-011(b), acid waste lines and former sump
- Former building 21-152 footprint and associated former structures footprints
- Former building 21-155 footprint and associated former structures footprints
- Former building 21-209 footprint and associated former structure 21-466 footprint
- AOC 21-028(d), former loading dock at former building 21-209

Buildings 21-152, 21-155, and 21-209 were connected to various SWMUs, AOCs, and consolidated units at DP East, which are part of the DP Site Aggregate Area.

The SWMUs and AOCs addressed in this investigation report are potentially contaminated with both hazardous and radioactive components. The New Mexico Environment Department (NMED), pursuant to the New Mexico Hazardous Waste Act, regulates cleanup of hazardous wastes and hazardous constituents. DOE regulates cleanup of radioactive contamination, pursuant to DOE Order 5400.5, Radiation Protection of the Public and the Environment; DOE Order 435.1, Radioactive Waste Management; and DOE Order 458.1, Administrative Change 2, Radiation Protection of the Public and the Environment. Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to NMED in accordance with DOE policy.

Corrective actions at the Laboratory are subject to a Compliance Order on Consent (the Consent Order). This investigation report describes work activities that were executed and completed in accordance with the Consent Order.

1.1 General Site Information

The portion of the DP Site Aggregate Area addressed in this report consists of one SWMU, one AOC, one consolidated unit (consisting of two SWMUs and an AOC), and all DP East building footprints located on DP Mesa within TA-21 (Figure 1.0-2). From 1945 to 1978, TA-21 was used primarily for plutonium research, metal production, and related activities. Since 1978, various administrative and research activities have been conducted at TA-21. Currently, the TA-21 project offices are located on-site. The current land use is industrial and will remain industrial for the reasonably foreseeable future. Historical details of previous investigations are provided in section 2.

1.2 Purpose of Investigation

The sites addressed in this investigation report are potentially contaminated with hazardous chemicals and/or radionuclides. The overall objectives for investigating these sites are to (1) determine the nature and extent of contamination; (2) determine whether current site conditions pose a potential unacceptable risk/dose to human health or the environment; and (3) assess whether any additional sampling and/or corrective actions are required.

The primary objective of this investigation was to remove industrial waste lines and structures and/or characterize the sites in accordance with the approved work plans for the DP Delayed Sites (LANL 2009, 108166.9; NMED 2010, 108443) and DP East Building Footprints (LANL 2010, 110082.4; NMED 2010, 110422).

1.3 Brief Scope of Investigation

This investigation report describes the status and results of investigation activities conducted to date. Included in Table 1.3-1 are brief descriptions of each of the six sites, and for each site, a summary of previous investigations and investigation activities conducted in 2010–2011. Details of the investigation activities are provided in section 4.2 and Appendix B.

The overall scope of the investigation involved site access and premobilization; geodetic surveying; field screening; waste line and structure removals; surface and subsurface site characterization, including sample collection, handling, and laboratory analyses; equipment decontamination; and investigation derived waste (IDW) storage and disposal.

1.4 Document Organization

This report is organized into 10 sections, including this introduction, with multiple supporting appendixes. Section 2 includes background information on TA-21 and the investigation sites, including description, relationship to other sites, current site usage and status, overview of operational history, summaries of releases and previous investigations, and historical nature and extent of contamination. Section 3 includes general surface and subsurface conditions at TA-21 (soil, water, land use, stratigraphy, groundwater, and hydrogeology) and the current site conditions at each investigation site. Field methods and activities conducted during implementation of the approved work plans and any deviations from the work plans are provided in section 4. Section 5 presents the data review process, including the nature and extent determination methodology, identification of chemicals of potential concern (COPCs), and an overview of applicable statistical methods. The regulatory criteria for evaluating potential risk/dose are provided in section 6, including current and future land use(s), risk/dose screening, and cleanup standards. Section 7 includes the site contamination for each investigation site, including discussions of the nature and extent of contamination. The conclusions are presented in section 8, including summaries of the investigation activities, the nature and extent of contamination, and additional data requirements. Section 9 presents the recommendations for the sites where the nature and extent of contamination are not defined. Section 10 includes the references cited and the map data sources used in figures and plates.

Appendixes include acronyms, a metric conversion table, and definitions of the data qualifiers used in this report (Appendix A); field methods (Appendix B); sample collection logs (SCLs), chain-of-custody (COC) forms, and analytical suites and results (Appendix C); radiological surveys (Appendix D); IDW management (Appendix E); and analytical program (Appendix F).

2.0 BACKGROUND

2.1 TA-21

TA-21 is located on DP Mesa on the northern boundary of the Laboratory and is immediately east-southeast of the Los Alamos townsite (Figure 1.0-1). It extends from the mesa top to the stream channels in two adjacent canyons, DP Canyon to the north and Los Alamos Canyon to the south.

During World War II, the Laboratory was established for the research, development, and testing of the first deliverable nuclear weapon. In 1945, the operations for establishing the chemical and metallurgical properties of the nuclear material necessary to achieve and sustain the nuclear fission reaction were transferred to newly built facilities at TA-21. TA-21 includes five Material Disposal Areas (MDAs): A, B, T, U, and V (Figure 1.0-1).

DP West operations began in September 1945, primarily to produce metal and alloys of plutonium from nitrate solution feedstock provided by other production facilities. This procedure involved several acid dissolution and chemical precipitation steps to separate the plutonium and other valuable actinides from the feedstock. A major research objective at DP West was the development of new purification techniques that would increase the efficiency of the separation processes (Christensen and Maraman 1969, 004779). Details of the purification techniques are discussed in the operable unit work plan for TA-21 (LANL 1991, 007529). Other operations performed at DP West included nuclear fuel reprocessing. In 1977, transfer of work to the new plutonium facility at TA-55 began and much of the DP West complex was vacated.

DP East operations also began in September 1945. These facilities were used to process polonium and actinium and to produce initiators (a nuclear weapons component). In 1964, building 21-209 was built to house research into high-temperature and actinide chemistry. Building 21-155 housed the Tritium Systems Test Assembly (TSTA) for developing and demonstrating effective technology for handling and processing deuterium and tritium fuels used in fusion reactors.

2.2 Consolidated Unit 21-004(b)-99, Aboveground Storage Tanks and Former Outfall

2.2.1 Site Description and Operational History

Consolidated Unit 21-004(b)-99 (Figure 2.2-1) consists of SWMUs 21-004(b) and 21-004(c) and AOC 21-004(d). SWMUs 21-004(b) and 21-004(c) were two aboveground stainless-steel tanks (structure 21-346) that were installed in 1979. These tanks were used as overflow holding tanks for liquid waste from cooling towers and from Laboratory and radionuclide experimental operations in the TSTA facility (building 21-155). Each tank was 9 ft high and 8 ft in diameter with a capacity of 3000 gal. (LANL

1990, 007512). Both tanks were mounted on steel legs above the surface of an asphalt bermed area. The bermed area had a capacity of approximately 9600 gal. and measured 36 ft long by 18 ft wide.

AOC 21-004(d) is the drain line connected to these tanks and an outfall area that was present in 1965 before the tanks were installed. The tanks were connected to the existing vitrified clay outfall pipe and concrete headwall (a small retaining wall placed at the ground surface where the outlet of a stormwater pipe or culvert discharged) by an aboveground 6-in. galvanized pipe that connected to the top of the tanks. The former outfall area [AOC 21-004(d)] was located where the concrete headwall was situated (Figure 2.2-1). The tanks, headwall, waste lines, and asphalt were removed during investigation activities, and the site has been backfilled to the surrounding site grade and seeded.

2.2.2 Relationship to Other SWMUs and AOCs

Consolidated Unit 21-004(b)-99 is located immediately northwest SWMU 21-024(n) and east of SWMU 21-024(h) (Figure 2.2-1). These SWMUs were investigated during the DP Site Aggregate Area investigation, and the results were reported in the Phase II investigation report (LANL 2010, 110772.33).

2.2.3 Summary of Releases

Surface and subsurface contamination may have resulted from undocumented releases to the former outfall area from Laboratory operations that occurred before the aboveground tanks were installed. Unintentional spills and leaks from the tanks may have resulted in surface and subsurface contamination. Subsurface contamination also may have occurred as a result of leaks from the waste lines associated with this consolidated unit.

2.2.4 Previous Investigations

In 1988, a sample was collected 2-ft downslope of the headwall from beneath the outfall pipe (LANL 1991, 007529, p. 15-96). Two boreholes were drilled downslope of tanks 21-346 to a total depth of 5 ft below ground surface (bgs) in the fall of 1994 during Resource Conservation and Recovery Act facility investigation (RFI) activities (LANL 1996, 054828, pp. 32–33). The last samples collected at this consolidated unit were in the fall of 1994.

2.2.5 Historical Nature and Extent of Contamination

Plutonium-239, tritium, and uranium-234 were detected above background values/fallout values (BVs/FVs) in the 1988 sample collected 2 ft downslope of the outfall discharge area (LANL 1991, 007529, p. 15-97). No inorganic chemicals or radionuclides were detected above background in the 1994 RFI samples collected downslope of the tanks (LANL 1996, 054828, pp. 33–34). These data were not included in the data analysis presented in section 7 because they were collected over 15 yr ago.

2.3 SWMU 21-011(b), Acid Waste Lines and Sump

2.3.1 Site Description and Operational History

SWMU 21-011(b) (Figure 2.3-1) consists of an acid waste sump (structure 21-223) and associated waste lines. The sump was located inside a small metal containment building that was located approximately 760 ft east of the TA-21 waste treatment plant (building 21-257) and 70 ft northwest of the TSTA (building 21-155). In 1965, a 4-in. waste line was installed to transport acid waste from building 21-155 to the sump. From the sump, a 3-in. waste line transported acid waste to the old waste treatment plant/laboratory (building 21-035) (LASL 1968, 089722; Francis 1997, 076126). The sump also connected to a 6-in. vitrified clay overflow pipe, which discharged to DP Canyon, eventually running into the same area as the discharge from the SWMU 21-024(h) septic system (LASL 1968, 089722). The SWMU 21-024(h) outfall was addressed in the DP Site Aggregate Area Phase I and II investigations (LANL 2004, 087461; NMED 2005, 089314; LANL 2008, 104989).

In 1967–1968, the old waste treatment plant/laboratory (building 21-035) was removed and the sump outlet line was extended to the new waste treatment plant (building 21-257) (LASL 1968, 089723; LASL 1975, 089724). In 1979, the sump overflow pipe was connected to the aboveground stainless-steel storage tanks ([structure 21-346, SWMUs 21-004(b) and 21-004(c)] LASL 1979, 089721). In the mid- to late-1980s, two new 4-in. acid waste steel or iron lines (LANL 1988, 087575) were connected from building 21-155 to a manhole (structure 21-222) to be pumped by the sump (LASL 1977, 089726). This line continued to another manhole (structure 21-221) (Figure 2.3-1).

The sump and a portion of the line outside of the MDA T boundary were removed during investigation activities, and the site has been backfilled to the surrounding site grade and seeded.

2.3.2 Relationship to Other SWMUs and AOCs

SWMU 21-011(b) industrial waste line runs along the north side of MDA A and eventually extends within the boundary of MDA T. SWMU 21-022(f), a removed sump (structure 21-173), and an industrial waste line, connected to the east end of SWMU 21-011(b) (Figure 2.3-1). The sump (21-173) was removed and investigated during the DP Site Aggregate Area investigation, and the results were reported in the Phase II investigation report (LANL 2010, 110772.33).

2.3.3 Summary of Releases

Unintentional leaks from the waste line and sump associated with this SWMU may have resulted in subsurface contamination.

2.3.4 Previous Investigations

This SWMU has not been investigated previously.

2.3.5 Historical Nature and Extent of Contamination

No historical data are available for this SWMU.

2.4 Former Building 21-152 and Associated Former Structures Footprints

2.4.1 Site Description and Operational History

This site (Figure 2.4-1) consists of buildings 21-152 (formerly building 21-52), 21-153, 21-166, 21-167, and 21-370 and exhaust stacks (structures 21-322 and 31-323). DP East buildings and structures, including these five, were shut down in 2003 and all structures, except building 21-153, including their foundations, were removed in 2010 during decontamination and decommissioning (D&D) activities (LANL 2011, 206183). Building 21-153, including the foundations, had been removed previously in the 1970s (Harper and Garde 1981, 006281). The site has been covered with approximately 1 ft of clean backfill/gravel. Descriptions of the former buildings and structures are provided below.

- Building 21-152 was built in mid- to late 1945 as a laboratory for initiator research and production that involved the use of actinium and polonium (McGehee and Garcia 1999, 087442). This building also served as a production facility during Project Rover to support high temperature chemistry research. Project Rover was a major program at the Laboratory from 1952 to 1973 to develop the technology to build a thermonuclear rocket. Project Rover research in this building also involved the coating of reactor parts and fuel elements with a refractory material for protection from high-temperature hydrogen. After the shutdown of Project Rover in 1972−1974, cold-fusion work was conducted in the south end of the building. In 1977, the TSTA project used the building as a laboratory for tritium research and technology in support of the fusion program (McGehee and Garcia 1999, 087442).
- There were belowground pipe trenches around the perimeter of building 21-152. In 1958, an equipment room was added to the northwest corner of building 21-152 for the propulsion program work. In 1960, a small room was added at the southeast corner of building 21-152 along the east wall to house vacuum pumps.
- Building 21-153 was constructed in 1945 and used as a filter house connected to building 21-152 (LANL 1990, 007512). Building 21-153 was demolished in the late 1970s (Harper and Garde 1981, 006281) and is currently a parking area.
- Buildings 21-166 and 21-167 were constructed in the mid-1940s to collect vacuum-pump waste from the building 21-152 laboratories (LANL 1984, 109229) and to house air-conditioning/heating equipment (LASL 1945, 109230). Building 21-370 was constructed in 1985 to house air-handling equipment (McGehee and Garcia 1999, 087442). Buildings 21-166, 21-167, and 21-370 were demolished in 2010 (LANL 2011, 206183).
- Two exhaust stacks (structures 21-322 and 21-323) were constructed of steel and were approximately 50 ft tall. The stacks were mounted on reinforced concrete pads and connected to building 21-152 by ductwork. Exhaust containing mostly tritium from laboratory hoods in building 21-209 flowed into the stacks above ground surface (http://www.lanl.gov/environment/air/neshap/hist_ast.shtml). The stacks were demolished in 2010 (LANL 2011, 206183).

2.4.2 Relationship to Other SWMUs and AOCs

Building 21-152 and associated buildings were connected to SWMU 21-022(f) (sump and industrial waste line) to the north, SWMU 21-024(h) (outfall) to the north, and SWMU 21-024(k) (outfall) to the south (Figure 2.4-1). These sites were investigated during the DP Site Aggregate Area investigation, and the results were presented in the Phase II investigation report (LANL 2010, 110772.33). However, a portion of SWMU 21-024(k) waste line was not removed during the Phase II Aggregate Area investigation because it was located in the same pipe trench as the vacuum waste line between buildings 21-166 and 21-167 (Figure 2.4-1). This line was removed during this current investigation. Appendix B provides additional information.

2.4.3 Summary of Releases

Unintentional spills from the laboratory operations may have resulted in subsurface contamination Subsurface contamination also may have occurred as a result of leaks from the waste line associated with the waste systems in the buildings as well as the two diesel generators located in the northwest section of building 21-152. Tritium was also released from the stacks.

2.4.4 Previous Investigations

No previous investigations have been conducted at this site.

2.4.5 Historical Nature and Extent of Contamination

No historical data are available.

2.5 Former Building 21-155 and Associated Former Structures Footprints

2.5.1 Site Description and Operational History

This site (Figure 2.5-1) consists of the footprints of buildings 21-155 (formerly 21-55), 21-213 (storage building), cooling towers (structures 21-220 and 21-420), and an exhaust stack (structure 21-388). DP East buildings and structures were shut down in 2003 and removed along with their foundations in 2010 during D&D activities (LANL 2011, 206183). The site has been covered with approximately 1 ft of clean backfill/gravel. Descriptions of these former buildings and structures are provided below.

- Building 21-155 was built in 1949 and used until the mid- to late 1960s for initiator research and production that involved the use of actinium and polonium for Project Rover (McGehee and Garcia 1999, 087442). Project Rover was a major program at the Laboratory from 1952 to 1973 to develop the technology to build a thermonuclear rocket. After Project Rover ended, building 21-155 was used as a production center and a tritium research and development center for the Laboratory's fusion program (McGehee and Garcia 1999, 087442).
- Sections of building 21-155, formerly referred to as 21-206 and 21-207, were built in 1963 through 1965 to support the high-temperature chemistry work of Project Rover.
- Building 21-213 was built in 1964 and was used as a warehouse. It was demolished in 2010 (LANL 2011, 206183).
- Cooling-tower structure 21-220 was used for heating, ventilation, and air conditioning; it was constructed in 1964−1965 and was demolished recently. Cooling-tower structure 21-420 replaced structure 21-220 and was also demolished recently (LANL 2011, 206183).
- Former steel exhaust stack structure 21-388 was approximately 50 ft tall. It was mounted on reinforced concrete pads and connected to building 21-155 by ductwork. Exhaust containing mostly tritium from laboratory hoods in building 21-209 flowed into the stack above the ground surface (http://www.lanl.gov/environment/air/neshap/hist_ast.shtml). It was demolished in 2010 (LANL 2011, 206183).

2.5.2 Relationship to Other SWMUs and AOCs

Building 21-155 was connected to SWMU 21-024(j) (outfall) to the south and SWMU 21-024(n) (outfall) to the north (Figure 2.5-1). These sites were investigated during the DP Site Aggregate Area investigation, and the results were presented in the Phase II investigation report (LANL 2010, 110772.33).

2.5.3 Summary of Releases

Unintentional spills from the laboratory operations may have resulted in subsurface contamination. Subsurface contamination also may have occurred as a result of leaks from the waste line associated with the waste systems in the buildings. Tritium was also released from the stacks.

2.5.4 Previous Investigations

No previous investigations have been conducted at this site.

2.5.5 Historical Site Nature and Extent of Contamination

No historical data are available.

2.6 Former Building 21-209 and Associated Former Structure 21-466 Footprints

2.6.1 Site Description and Operational History

This site (Figure 2.6-1) consists of building 21-209 and an exhaust stack (structure 21-466). DP East buildings and structures, including these two, were shut down in 2003 and removed in 2010 during D&D activities (LANL 2011, 206183). The basement portion of the building (Figure 2.6-1) was left in place and backfilled with clean demolition debris from building 21-209. The site has been covered with approximately 1 ft of clean backfill/gravel. Descriptions of the former building 21-209 and structure 21-466 are provided below.

- Building 21-209 was constructed from 1964 to 1965 and originally designated as the "High-Temperature Chemistry Facility" (McGehee and Garcia 1999, 087442). The building originally contained the administrative office facility and laboratories for TSTA and was used to support Project Rover until 1977 and thereafter was used to conduct tritium research for the fusion program (McGehee and Garcia 1999, 087442). The central part of the building had a basement. All waste lines under the central portion of the building was attached to the basement ceiling. The east and west wings were constructed as slab on grade. The eastern wing of the building was used for offices (LASL 1964, 109231). The northwest section of the building was added as the dry glove box facility in approximately 1970 (LASL 1969, 109232).
- Structure 21-466 was a steel exhaust stack approximately 50 ft tall. It was mounted on reinforced concrete pads and was connected to building 21-209 by ductwork. Exhaust containing mostly tritium from laboratory hoods in building 21-209 flowed into the stack above the ground surface (http://www.lanl.gov/environment/air/neshap/hist_ast.shtml). It was demolished in 2010 (LANL 2011, 206183).

2.6.2 Relationship to Other SWMUs and AOCs

Building 21-209 was connected to SWMU 21-024(i) (outfall) to the south (Figure 2.6-1). Loading dock AOC 21-028(d) was also on the northwest side of the building. SWMU 21-024(i) was investigated during the DP Site Aggregate Area investigation, and the results were presented in the Phase II investigation report (LANL 2010, 110772.33).

2.6.3 Summary of Releases

Unintentional spills from the laboratory operations may have resulted in subsurface contamination. Subsurface contamination also may have occurred as a result of leaks from the waste lines associated with the waste system in the building. Tritium was also released from the stack.

2.6.4 Previous Investigations

No previous investigations have been conducted at this site.

2.6.5 Historical Nature and Extent of Contamination

No historical data are available.

2.7 AOC 21-028(d), Former Loading Dock

2.7.1 Site Description and Operational History

This AOC consisted of a former storage site located on a concrete loading dock at the northwest corner of building 21-209 (Figure 2.7-1) (LANL 1991, 007529). The dock dimensions were approximately 8.5 ft wide by 60 ft long by 3.25 ft deep. The dock and the foundations were removed in 2010 during D&D activities (LANL 2011, 206183). The AOC has been covered with approximately 1 ft of clean backfill/gravel.

Storage of containers on the loading dock likely began in 1965 when building 21-209 was constructed (LANL 1991, 007529, p. 14-39). The dock was used to store 55-gal. drums of lithium-deuterium waste; 30- and 55-gal. drums of fissionable waste (waste containing natural uranium, natural thorium, uranium-235, uranium-238, thorium-228, thorium-230, and thorium-232); and gas cylinders of tritium-contaminated hydrogen and argon gas (LANL 1991, 007529, p. 14-39). Containers of product stored in the same area included cylinders of deuterium, argon, nitrogen, helium, and compressed hydrogen; 55-gal. drums of oil; acetone; Convoil 20 (a multipurpose vacuum pump fluid); ethanol; ethyl alcohol; and various solvents stored in a chemical safety cabinet (LANL 1991, 007529, p. 14-39).

2.7.2 Relationship to Other SWMUs and AOCs

AOC 21-028(d) was connected to building 21-209 and the waste line from SWMU 21-011(b) ran under the loading dock (Figure 2.7-1). This building and SWMU 21-011(b) were investigated during this field campaign.

2.7.3 Summary of Releases

Unintentional spills from containers stored on the loading dock may have resulted in surface and subsurface contamination.

2.7.4 Previous Investigations

RFI activities conducted in 1994 included a radiological surface survey of the area adjacent to the west side of the loading dock and soil sampling (0- to 0.5-ft-depth interval) from four locations in this same area. These samples were sent to an off-site laboratory for analyses of inorganic and organic chemicals and radionuclides (LANL 1996, 054828, pp. 37–47). The site was recommended for no further action in the RFI report (LANL 1996, 054828, p. 51). The data indicated that inorganic chemicals and radionuclides were detected above BVs/FVs (LANL 1998, 059730) and that organic chemicals were detected. The vertical extent was not defined since only one depth was sampled. Additionally, these samples were not collected in the area of the highest radiological activity as indicated by radiological survey results (LANL 1996, 054828, pp. 39–42).

2.7.5 Historical Nature and Extent of Contamination

Quality assurance (QA)/quality control (QC) information is not available for the four samples collected and analyzed. The data collected indicated inorganic chemicals and radionuclides were detected above

BVs/FVs (LANL 1998, 059730) and organic chemicals were also detected. Vertical extent was not defined since only one depth was sampled. Additionally, these samples were not collected in the area of the highest radiological activity as indicated by radiological survey results (LANL 1996, 054828, pp. 39–42). Therefore, the RFI data are screening-level data and were not included in the data analysis presented in section 7.

3.0 SITE CONDITIONS

Surface and subsurface conditions at TA-21 and surface conditions at each of the investigation sites are described in this section.

3.1 Surface Conditions

3.1.1 Soil

Soil on the Pajarito Plateau was initially mapped and described by Nyhan et al. (1978, 005702). The study included only Laboratory-controlled land and certain U.S. Forest Service land within Los Alamos County. Currently, all the sites have been disturbed as a result of removing waste lines and D&D activities. The mesa top at TA-21 (except at the edges near the cliff face) was used for industrial purposes from the mid-1940s and thereafter, and little undisturbed soil covers the tuff. Soil consists of fill, reworked native soils, and tuff fill. In most places, native undisturbed soil cannot be easily distinguished from fill soil. Following D&D in 2010 (LANL 2011, 206183), approximately 1 ft of clean fill/gravel was placed over the building footprints and the sites were regraded. The areas where the pipe and asphalt were removed at SWMU 21-011(b) were also backfilled and seeded.

3.1.2 Surface Water

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

No permanent surface water exists on the mesa at TA-21. However, intermittent surface-water runoff occurs as a result of usually short, often intense, seasonal thunderstorms that can produce large amounts of rain. Snowmelt is also a source of runoff.

3.1.3 Land Use

Current land use of the DP Site Aggregate Area is industrial. It is anticipated that the area will remain industrial and will not change in the reasonably foreseeable future, even if it is transferred to Los Alamos County. Public access is currently limited at TA-21 through physical controls such as fencing and signage.

3.2 Subsurface Conditions

3.2.1 Stratigraphy

TA-21 is centrally located on the Pajarito Plateau approximately midway between the flanks of the Jemez Mountains on the west and the Rio Grande to the east. The general stratigraphy beneath TA-21 has been defined from investigations conducted in recent years (Figure 3.2-1). Additional information about the geologic setting of the TA-21 area and information about the Pajarito Plateau can be found in the installation work plan (LANL 1998, 062060); the TA-21 operable unit work plan (LANL 1991, 007529); and the hydrogeologic work plan (LANL 1998, 059599). The following sections describe the geologic units encountered beneath TA-21.

Santa Fe Group

The Santa Fe Group consists of predominately fluvial, slightly consolidated sedimentary rock that crop out in the lower reaches of Los Alamos Canyon, along White Rock Canyon, and in extensive areas east of the Rio Grande (Galusha and Blick 1971, 021526). In the Pajarito Plateau, the Santa Fe Group consists of the Tesuque Formation and the Chamita Formation. A trough of late Miocene coarse-grained sediment at the top of the Santa Fe Group, which postdates the Chamita Formation and these deposits, is called the Chaquehui Formation (Purtymun 1995, 045344). The trough is filled with 1500 ft of gravels, cobbles, and boulders derived from highlands to the north and east. Regional cross-sections show the Chaquehui Formation exists beneath TA-21.

Puye Formation

The Puye Formation is a fanglomerate deposit consisting of poorly sorted boulders, cobbles, and coarse sand consisting of dacitic to latitic debris eroded from the contemporaneous Tschicoma Formation (Turbeville et al. 1989, 021587; Spell et al. 1990, 021586). The unit is 940 ft thick and may consist of interbedded basalt flows of the Cerros del Rio volcanic field and Tschicoma Formation (LANL 1991, 007529). Also included in the Puye Formation is the Totavi Lentil, a deposit of well-rounded cobbles and boulders of Precambrian quartzites and crystalline rocks (Griggs and Hem 1964, 092516).

The Bandelier Tuff

The Valles Caldera erupted between 1.61 and 1.22 million years ago, creating the Bandelier Tuff. The unit is divided into the Otowi (Qbo) and Tshirege (Qbt) Members, which are separated by the Cerro Toledo interval. The tuff is rhyolitic, with a strong consolidated matrix of crystals. Because the Bandelier Tuff is the most prominent rock type on the Pajarito Plateau, its detailed stratigraphy is of considerable importance and is discussed further below (Broxton and Reneau 1995, 049726).

The nature and extent of the Otowi Member are described by Griggs and Hem (1964, 092516); Smith and Bailey (1966, 021584); Bailey et al. (1969, 021498); and Smith et al. (1970, 009752). The Otowi Member consists of moderately consolidated (indurated), porous, and nonwelded vitric tuff (ignimbrite) that forms gentle colluvium-covered slopes along the base of canyon walls. The Otowi ignimbrites contain light gray to orange pumice supported in a white to tan ash matrix (Broxton and Eller 1995, 058207; Goff 1995, 049682). The ash matrix consists of glass shards, broken pumice and crystal fragments, and fragments of perlite.

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

Tephras and Volcaniclastic Sediment of the Cerro Toledo Interval

The Cerro Toledo interval is an informal name given to a sequence of volcaniclastic sediment and tephra of mixed provenance that separates the Otowi and Tshirege Members of the Bandelier Tuff (Broxton and Eller 1995, 058207; Broxton and Reneau 1995, 049726; Goff 1995, 049682). Although it is intercalated between the two members of the Bandelier Tuff, it is not considered part of that formation (Bailey et al. 1969, 021498). Outcrops of the Cerro Toledo interval generally occur wherever the top of the Otowi Member appears in Los Alamos Canyon and in canyons to the north; the interval outcrops in the TA-21 area. The unit contains primary volcanic deposits normally assigned to the Cerro Toledo rhyolite, as described by Smith et al. (1970, 009752), as well as intercalated and reworked volcaniclastic sediment not normally included in the Cerro Toledo rhyolite. The occurrence of the Cerro Toledo interval is widespread; however, its thickness is variable, ranging between several feet and more than 100 ft.

The predominant rock types in the Cerro Toledo interval at TA-21 are rhyolitic tuffaceous sediment and tephra (Heiken et al. 1986, 048638; Stix et al. 1988, 049680; Broxton and Eller 1995, 058207; Goff 1995, 049682). The tuffaceous sediment is the reworked equivalent of Cerro Toledo rhyolite tephra that erupted from the Cerro Toledo and Rabbit Mountain rhyolite domes located in the Sierra de los Valles. At TA-21, oxidation and clay-rich horizons indicate at least two periods of soil development occurred within the Cerro Toledo deposits. Because this soil is rich in clay, it may act as a barrier to the movement of vadose-zone groundwater. Some of the epiclastic tuffaceous deposits contain both crystal-poor and crystal-rich varieties of pumice. The ashy matrix of these deposits is commonly rich with crystals and contains subhedral sanadine and quartz. The mixed pumice and the crystal-rich nature of the matrix indicate this reworked tuff was derived from both the Cerro Toledo rhyolite and the underlying Otowi Member. The pumice falls tend to form porous and permeable horizons within the Cerro Toledo interval, and locally, they may provide important pathways for moisture transport in the vadose zone. A subordinate lithology within the Cerro Toledo interval includes clast-supported gravel, cobble, and boulder deposits consisting of porphyritic dacite derived from the Tschicoma Formation interbedded with the tuffaceous rock, and in some deposits, dacitic materials are volumetrically more important than rhyolitic detritus (Broxton and Eller 1995, 058207; Goff 1995, 049682; Broxton and Reneau 1996, 055429).

Tshirege Member

The Tshirege Member is the upper member of the Bandelier Tuff and is the most widely exposed bedrock unit of the Pajarito Plateau (Griggs and Hem 1964, 092516; Smith and Bailey 1966, 021584; Bailey et al. 1969, 021498; Smith et al. 1970, 009752). Emplacement of this unit occurred during eruptions of the Valles Caldera approximately 1.2 million years ago (Izett and Obradovich 1994, 048817; Spell et al. 1996, 055542). The Tshirege Member is a multiple-flow, ash-and-pumice sheet that forms the prominent cliffs in most of the canyons on the Pajarito Plateau and at TA-21. It is a chemical cooling unit whose physical properties vary vertically and laterally. The consolidation in this member is largely from compaction and welding at high temperatures after the tuff was emplaced. Its light brown, orange-brown, purplish, and white cliffs have numerous, mostly vertical fractures (called joints) that average between several feet and several tens of feet. The Tshirege Member includes thin but distinctive layers of bedded, sand-sized particles called surge deposits that demark separate flow units within the tuff. The Tshirege Member is generally over 200 ft thick.

The Tshirege Member differs from the Otowi Member most notably in its generally greater degree of welding compaction. Time breaks between the successive emplacements of flow units caused the tuff to cool as several distinct units. For this reason, the Tshirege Member is a chemical-cooling unit, consisting of at least four cooling subunits that display variable physical properties vertically and horizontally (Smith and Bailey 1966, 021584; Crowe et al. 1978, 005720; Broxton and Eller 1995, 058207). These variations in physical properties reflect zonal patterns of different degrees of welding and glass crystallization that accompanies welding (Smith 1960, 048820; Smith 1960, 048819). The welding and crystallization variability in the Tshirege Member produces recognizable vertical variations in its properties, such as density, porosity, hardness, composition, color, and surface-weathering patterns. The subunits are mappable, based on a combination of hydrologic properties and lithologic characteristics.

Descriptions of the Tshirege Member cooling units (Broxton and Eller 1995, 058207), in ascending order, are provided below.

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

Qbt 1g is the lowermost subunit of the thick ignimbrite sheet overlying the Tsankawi Pumice Bed. It consists of porous, nonwelded, and poorly sorted ash-flow tuff. The “g” in this designation stands for glass because none of the glass in ash shards and pumices shows crystallization by devitrification or vapor-phase crystallization. This unit is poorly indurated but nonetheless forms steep cliffs because of a resistant bench near the top of the unit; the bench forms a harder protective cap over the softer underlying tuff. A thin (4–10 in.) pumice-poor surge deposit commonly occurs at the base of this unit.

Qbt 1v forms alternating cliff-like and sloping outcrops composed of porous, nonwelded, crystallized tuff. The “v” stands for vapor-phase crystallization, which, together with in situ crystallization devitrification, has converted much of the glass in shards and pumices into microcrystalline aggregates. The base of this unit is a thin horizontal zone of preferential weathering that marks the abrupt transition from glassy tuff below (in unit 1g) to the crystallized tuff above. This feature forms a widespread marker horizon (locally termed the vapor-phase notch) throughout the Pajarito Plateau, which is readily visible in canyon walls at TA-21. The lower part of Qbt 1v is orange-brown, is resistant to weathering, and has distinctive columnar (vertical) joints; hence, the term “colonnade tuff” is appropriate for its description. A distinctive white band of alternating cliff- and slope-forming tuff overlies the colonnade tuff. The tuffs of Qbt 1v are commonly nonwelded (pumices and shards retain their initial equant shapes) and have an open, porous structure.

Qbt 2 forms a distinctive, medium-brown, vertical cliff that stands out in marked contrast to the slope-forming, lighter-colored tuffs above and below at TA-21. It displays the greatest degree of welding in the Tshirege Member. A series of surge beds commonly marks its base. It is typically nonporous and has low permeability relative to the other units of the Tshirege Member. Vapor-phase crystallization of flattened shards and pumice is extensive in this unit.

Qbt 3 is a nonwelded to partially welded, vapor-phase, altered tuff that forms many of the upper cliffs in the TA-21 area. Its base consists of a purple-gray, unconsolidated, porous, and crystal-rich nonwelded tuff that underlies a broad, gently sloping bench developed on top of Qbt 2. This basal, nonwelded portion forms relatively soft outcrops that weather into low rounded mounds with a white color, which contrast with the cliffs of partially welded tuff in the middle and upper portions of Qbt 3.

3.2.2 Hydrogeology

The hydrogeology of the Pajarito Plateau is generally separable in terms of mesas and canyons forming the plateau. Mesas are generally devoid of water, both on the surface and within the rock forming the mesa. Canyons range from wet to relatively dry; the wettest canyons contain continuous streams and perennial groundwater in the canyon-bottom alluvium. Dry canyons have only occasional streamflow and may lack alluvial groundwater. Perched-intermediate groundwater has been found at certain locations on the plateau at depths ranging between 100 and 700 ft bgs. No perched water has been encountered during well drilling at TA-21. The regional aquifer is found at depths of about 600 to 1200 ft bgs (Collins et al. 2005, 092028).

The hydrogeologic conceptual site model for the Laboratory (LANL 2010, 109830) shows that, under natural conditions, relatively small volumes of water move beneath mesa tops because of low rainfall, high evaporation, and efficient water use by vegetation. Atmospheric evaporation may extend into mesas, further inhibiting downward flow.

Groundwater

In the Los Alamos area, groundwater occurs as (1) water in shallow alluvium in some of the larger canyons; (2) perched-intermediate groundwater (a perched-groundwater body lies above a less permeable layer and is separated from the underlying aquifer by an unsaturated zone); and (3) the regional aquifer (Collins et al. 2005, 092028). Numerous wells have been installed at the Laboratory and in the surrounding area to investigate the presence of groundwater in these zones and to monitor groundwater quality.

The Laboratory formulated a comprehensive groundwater protection plan for an enhanced set of characterization and monitoring activities. The Laboratory's annual Interim Facility-Wide Groundwater Monitoring Plan (LANL 2011, 205231) details the implementation of extensive groundwater characterization across the Pajarito Plateau within an area potentially affected by past and present Laboratory operations.

At TA-21, a new regional groundwater well (R-64) was installed in 2011 just north of MDA T. The depth to groundwater is approximately 1270 ft bgs (LANL 2011, 208721).

The locations of the existing monitoring wells within the vicinity of the DP Site Aggregate Area are shown in Figure 3.2-2.

Regional Groundwater

The regional aquifer is the only aquifer capable of large-scale municipal water supply in the Los Alamos area (Purtymun 1984, 006513). The surface of the regional aquifer rises westward from the Rio Grande within the Santa Fe Group into the lower part of the Puye Formation beneath the central and western part of the Pajarito Plateau. The depths to the regional aquifer below the mesa tops range between about 1200 ft bgs along the western margin of the plateau and about 600 ft bgs at the eastern margin. The location of wells and generalized water-level contours on top of the regional aquifer are described in the annual General Facility Information report (LANL 2011, 201568). The regional aquifer is typically separated from the alluvial groundwater and perched-intermediate zone groundwater by 350 to 620 ft of tuff, basalt, and sediment (LANL 1993, 023249).

In the vicinity of TA-21, the upper surface of the regional aquifer is located in the Puye Formation and in the Santa Fe Group. The depths to water range from 707 ft to 1159 ft bgs (Koch and Schmeer 2011, 201566). The regional aquifer beneath the east end of DP Mesa occurs at a depth of 1159 ft bgs, based on water levels measured in well R-6. Shallow regional groundwater in the vicinity of TA-21 generally flows to the east-northeast (LANL 2011, 205231). The velocity of groundwater flow ranges from about 20 to 250 ft/yr (LANL 1998, 058841, pp. 2-7). Details of depths to the regional aquifer, flow directions and rates, and well locations are presented in various Laboratory documents (Purtymun 1995, 045344; LANL 1997, 055622; LANL 2000, 066802; LANL 2010, 109830).

Vadose Zone

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

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

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

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

4.0 FIELD INVESTIGATION ACTIVITIES

This section presents the 2010–2011 field investigation activities conducted in accordance with the approved investigation work plans (LANL 2009, 108166.9; NMED 2010, 108443; LANL 2010, 110082.4; NMED 2010, 110422). The scope of activities for the investigation included site access and premobilization, geodetic surveying, waste line and structure removals, surface and subsurface sampling, laboratory analysis, health and safety monitoring, and waste management. The most current versions of all standard operating procedures (SOPs) were used to implement the approved work plans. Details of the field methods and procedures used to perform field activities are provided in Appendix B. Any deviations from the approved investigation work plan are summarized in section 4.3 and described in Appendix B.

4.1 Site Access and Premobilization

Portions of TA-21 were undergoing remediation during the field investigation, resulting in road and foot traffic by Laboratory personnel. Before personnel were mobilized in the field, the issue of Laboratory worker access (e.g., traffic control plan, notifications) was reviewed as part of the management self-assessment process. Efforts were made to provide a secure and safe work area and to reduce impacts to Laboratory personnel, cultural resources, and the environment.

4.2 Field Activities

This section describes the field activities conducted during the 2010–2011 site investigation and the laboratory analyses requested. Field notes and data were recorded on the field SCLs, on the COC forms, and in the field logbook. SCLs and COC forms completed for this investigation are included in Appendix C (on DVD).

4.2.1 Geodetic Survey

Geodetic surveys were conducted during the field investigation to site surface and subsurface sampling locations. Initial geodetic surveys were performed to establish and mark the planned sampling locations in the field. Geodetic surveys were conducted in accordance with SOP-5028, Coordinating and Evaluating Geodetic Surveys, using a Trimble 5700 differential global positioning system. The surveyed coordinates for the sampling locations are presented in Table 4.2-1. The geodetic coordinates are expressed as State Plane Coordinate System 1983, New Mexico Central, U.S.

4.2.2 Field Screening

This section summarizes the field-screening methods and results of the field screening conducted at the sites during the characterization activities.

As the field investigation samples were collected, each was screened for radioactivity. A Laboratory radiation control technician (RCT) conducted radiological screening using an HP 210 pancake probe, a Ludlum 2221 probe, an Eberline 50-cm^2 alpha probe, Spa 3 type sodium iodine probe, a Ludlum 2929 smear counter, and a low-volume air sampler. Results for alpha and beta/gamma radioactivity were recorded in disintegrations per minute (dpm). Each sample was then placed into a sealed plastic bag for approximately 5 min, at which point the samples were field screened for headspace organic vapors using an 11.7-electronvolt MiniRAE 2000 photoionization detector (PID). Calibration and use of this instrument were performed according to the manufacturer’s specifications and SOP-06.33, Headspace Vapor Screening with a PID.

Field-screening results are presented in Table 4.2-2. Organic vapors were detected at less than 5 ppm above ambient air in all but two samples during PID screening of samples. At locations 21-613818 and 21-613819 at SWMU 21-011(b), PID readings were 83.6 ppm and 77.6 ppm in the top depths sampled. Trace levels of volatile organic compounds (VOCs) were detected at these locations. No radiological-screening results exceeded twice the daily site background levels. No changes to sampling or other activities occurred because of the field-screening results.

4.2.3 Radiological Survey Results

As prescribed by the approved investigation work plan (LANL 2009, 108166.9; NMED 2010, 108443), radiological surveys were conducted at excavated waste line trenches and at the outfall at SWMU 21-011(b) and Consolidated Unit 21-004(b)-99 on March 16–17 and June 23, 2011. The surveys, conducted by Environmental Restoration Group, Inc., included a static alpha-beta surface survey and global positioning system–based gamma surveys of excavated pipe trenches and beneath the asphalt pad. Because of the numerous possible radionuclides present at the site (americium-241, cesium-137, plutonium-239, strontium-90, and tritium), the surveys included alpha-beta, low-energy gamma, and high-energy gamma surveys. No areas of contamination were identified (Appendix D), and no highly elevated values with respect to the mean trench readings were detected. Based on these screening results, the prescribed sampling locations were sampled as-is and were not adjusted in the field.

4.2.4 Sample Management

A total of 494 samples were collected (including duplicates and blanks) and analyzed for chemical and radiological analytes in accordance with the approved investigation work plans (LANL 2009, 108166.9; NMED 2010, 108443; LANL 2010, 110082.4; NMED 2010, 110422). All surface and shallow subsurface samples were placed in appropriate sample containers and submitted to the analytical laboratory for the analyses specified by the approved investigation work plan. Standard QA/QC samples (field duplicates, field trip blanks, and rinsate blanks) were also collected in accordance with SOP-5059, Field Quality Control Samples.

All sample collection activities were coordinated with the Sample Management Office (SMO). After the samples were collected, they remained in the controlled custody of the field team at all times until they were delivered to the SMO. Sample custody was then relinquished to the SMO for delivery to a preapproved off-site analytical laboratory (SCLs and COC forms included in Appendix C [on DVD]).

4.2.4.1 Surface and Shallow Subsurface Soil Investigation

Table 4.2-1 shows the proposed sampling locations as listed in the approved investigation work plans (LANL 2009, 108166.9; NMED 2010, 108443; LANL 2010, 110082.4; NMED 2010, 110422), with the corresponding actual location identifiers as sampled.

Surface samples were collected using the spade-and-scoop method in accordance with SOP-06.09, Spade and Scoop Method for Collection of Soil Samples, or with a hand auger in accordance with SOP-06.10, Hand Auger and Thin-Wall Tube Sampler. The samples were collected in stainless-steel bowls and transferred to sample collection bottles with a stainless-steel spoon. Sample collection details, field methods, as well as deviations from the work plans are described in Appendix B.

4.2.4.2 Borehole Drilling and Subsurface Sampling

A hand auger or a power-auger truck-attachment was used to collect samples at all required sampling depths and locations; a drill rig with a hollow-stem auger was not used to collect subsurface samples. Samples were collected in accordance with approved subcontractor procedures technically equivalent to SOP-06.10, Hand Auger and Thin-Wall Tube Sampler, or SOP-06.09, Spade and Scoop Method for the Collection of Soil Samples. Appendix B provides a detailed summary of the field methods.

4.2.5 Borehole Abandonment

No boreholes were drilled using a drill rig during the 2010–2011 investigation. However, hand-auger sampling locations deeper than 15 ft bgs were abandoned in accordance with an approved subcontractor procedure that is technically equivalent to SOP-5034, Monitor Well and RFI Borehole Abandonment, by filling the auger holes with bentonite chips up to 2–3 ft from the ground surface. The chips were hydrated and clean soil was placed on top. All cuttings from those locations were managed as IDW as described in Appendix E.

4.2.6 Excavations

Excavations removed structures, waste lines, debris, and/or asphalt from the areas described below. Table 4.2-3 provides the coordinates for structures that could not be fully excavated because of the depth below the ground surface or nearby active utilities. Section 4.3 summarizes the deviations and Appendix B provides additional details.

Consolidated Unit 21-004(b)-99

The waste line connecting the acid waste sump (structure 21-223) and the aboveground storage tanks (structure 21-346) was excavated and removed. The waste included approximately 55 ft of vitrified clay pipe and 65 ft of 6-in. galvanized pipe.

The asphalt pad and berm associated with structure 21-346 were excavated. Material removed included approximately 30 yd^3 of asphalt.

All wastes were handled in accordance with the approved waste characterization strategy form (WCSF) (Appendix E).

SWMU 21-011(b)

The mechanical components of the acid waste sump, structure 21-223, were removed and the aboveground structure was demolished. The underground concrete portion of the sump was partially removed. Appendix B provides additional details of the removal.

The buried 3-in. cast-iron waste line from structure 21-223 to the MDA T boundary (approximately 700 ft of cast-iron pipe) was excavated and removed. Buried 6-in. cast-iron waste line, 2-in. steel or cast-iron waste line, and 4-in. steel or cast-iron waste line from buildings 21-155 and 21-152 to structure 21-223 (approximately 400 ft of steel and cast-iron line) were excavated and removed. Approximately 8 ft of waste line remains just east of the MDA T fence (Figure 2.3-1). Section 4.3 summarizes the deviations and Appendix B provides additional details.

Two manholes (structures 21-221 and 21-222) were partially removed. The concrete that formed the bottom of the manholes was left in place because the concrete was formed to the underlying tuff and was more than 10 ft bgs.

The industrial waste line between manholes 21-221 and 21-222 was not completely removed (Figure 2.3-1). Some of the waste line was left in place and partially grouted because an active fire water line runs parallel to and several feet shallower than the waste line.

All wastes were handled in accordance with the approved WCSF (Appendix E).

DP East Building Footprints

To collect some of the samples, it was necessary to excavate construction/demolition debris from some areas. Debris was excavated for this purpose on four separate occasions. The debris and any associated soil were excavated and containerized as waste.

Additionally, the cooling water return line north of building 21-155 was removed. This line consisted of approximately 60 ft of 2-in. polyvinyl chloride running east to west between sampling locations 21-614021 and 21-614022. Approximately 50 ft of line remains in place in this area (Figure 2.5-1). Additionally, the waste line around the northwest corner of 21-155 was left in place (Figure 2.5-1). Section 4.3 summarizes the deviations and Appendix B provides additional details.

Trenching was completed to approximately 10 ft bgs north of building 21-155 to locate the southwest waste line connecting to manhole 21-222.

All wastes were handled in accordance with the approved WCSF (Appendix E).

4.2.7 Equipment Decontamination

All field equipment with the potential to contact sample material (e.g., hand augers, sampling scoops, bowls, and core barrel sections) was decontaminated between each sample-collection event and between sampling locations to prevent cross-contamination of samples and sampling equipment. Dry decontamination was performed in accordance with SOP-5061, Field Decontamination of Equipment. Rinsate blanks were collected on sampling equipment to check the effectiveness of decontamination. The decontamination methods are described in Appendix B.

4.2.8 Sample Analyses

All samples were shipped by the SMO to contract analytical laboratories for the requested analyses. The analyses requested were as specified by the approved work plans (LANL 2009, 108166.9; NMED 2010, 108443; LANL 2010, 110082.4; NMED 2010, 110422). The samples were analyzed for all or a subset of the following: target analyte list (TAL) metals, total cyanide, nitrate, pH, perchlorate, explosive compounds, dioxins/furans, polychlorinated biphenyls (PCBs), asbestos, total petroleum hydrocarbons (TPH), diesel range organics (DRO), semivolatile organic compounds (SVOCs), VOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic thorium, isotopic uranium, strontium-90, technetium-99, and tritium.

Field duplicates of investigation samples were analyzed for the same analytical suites as the corresponding investigation samples, as applicable. Equipment rinsate blanks were analyzed for the same inorganic chemical suites as the related investigation samples. Field trip blanks were analyzed only for VOCs. Analytical methods and summaries of data quality are presented in Appendix F. Analytical results (Tables C-1 through C-5), analytical reports, and SCLs/COCs are included on DVD in Appendix C.

4.2.9 Health and Safety

All 2010–2011 investigation activities were conducted in accordance with an approved site-specific health and safety plan and integrated work document that detailed work steps, potential hazards, hazard controls, and required training to conduct work. These health and safety measures included the use of modified Level-D personal protective equipment and field monitoring for organic vapors and gross-alpha and -beta radioactivity using portable air-monitoring systems. No health and safety measures affected or limited task completion.

4.2.10 IDW Management

All IDW generated during the investigation was managed in accordance with SOP-5238, Characterization and Management of Environmental Program Waste. This procedure incorporates the requirements of applicable U.S. Environmental Protection Agency (EPA) and NMED regulations, DOE orders, and Laboratory implementation requirements, policies, and/or procedures. IDW was also managed in accordance with the approved WCSF. Details of IDW management are presented in Appendix E.

The waste streams associated with the investigation included excavation waste, uncontainerized liquid waste, and contact waste. Each waste stream was containerized and placed in an accumulation area appropriate for the regulatory classification of the waste, in accordance with the approved WCSF (Appendix E).

4.3 Deviations

Deviations occurred while conducting field activities according to the approved work plans (LANL 2009, 108166.9; NMED 2010, 108443; LANL 2010, 110082.4; NMED 2010, 110422). The deviations, necessary to accommodate site-specific field conditions, did not adversely affect the completion or results of the investigation. Deviations to sampling locations and analytical suites are summarized below.

Consolidated Unit 21-004(b)-99

- At locations 21-614322, 21-614324, 21-614325, and 21-614328, samples were collected from 0 to 1 ft rather than the 0- to 0.5-ft depth to collect adequate material for analyses.
- At location 21-614326, PCBs were inadvertently ordered for analysis in the 5- to 6-ft-depth interval.

SWMU 21-011(b)

- Because active systems in the vicinity of existing building 21-257 likely intersect the targeted acid waste line, a portion of the acid waste line was left in place. The acid waste line was removed up to the fence line of building 21-257 and MDA T (Figure 2.3-1). The portion of the acid waste line within the fence surrounding building 21-257 was left in place. The remaining line will be removed and proposed locations 30–43 (LANL 2009, 108166.9) will be sampled when building operations have ceased or changed such that active building systems will not interfere with the removal of the line and sampling.
- North of former building 21-155, the southwest waste line connecting to manhole structure 21-222 could not be found within approximately 10 ft bgs. Therefore, proposed sampling location 7 (LANL 2009, 108166.9, Figure 4.1-1) was not sampled.
- An approximately 50-ft section of the line on the west side of former building 21-155 was abandoned in place because it was encased in 2 ft of concrete foundation left in place by the D&D operations (Figure 2.3-1). Samples could not be collected at proposed sampling locations 4 and 5 (LANL 2009, 108166.9, Figure 4.1-1).
- Samples from locations 21-613828 and 21-613829 were inadvertently not analyzed for isotopic thorium. However, this does not affect the results because a total of 354 samples were analyzed for isotopic thorium at the sites investigated, with all detections at or below background levels. Therefore, it is unlikely that isotopic thorium would be detected above background at these two locations.

Former Building 21-152

- The sample collected at 8 to 9 ft bgs from location 21-614204 was inadvertently not analyzed for technetium-99. However, this does not affect the results because a total of 341 samples were analyzed for technetium-99 at the sites, with no detections. Therefore, it is unlikely that technetium-99 would be detected at this one location.
- The sample collected at the 5- to 6-ft-depth interval at location 21-614222 was inadvertently analyzed for TPH-DRO by the analytical laboratory.

Former Building 21-155

- Sampling locations 21-613977 and 21-613978 were moved approximately 5 ft west and 5 ft east, respectively, of a water line (LANL 2010, 110082.4, Figure 2.2-1).
- Location 21-614015 (LANL 2010, 110082.4, Figure 2.2-1) was moved 8 ft east of planned sampling location 39 because of the presence of concrete.
- Location 21-614001 (LANL 2010, 110082.4, Figure 2.2-1) was moved 5 ft northwest of planned sampling location 17 because of auger refusal.

Former Building 21-209

- Only one depth was sampled at location 21-612268 (LANL 2010, 110082.4, Figure 2.3-1) because of auger refusal. In addition, the sample collected was not analyzed for radionuclides because the sample size was small. This did not adversely affect the results. The results from samples collected the other floor drains in the area indicate additional sampling is not necessary at this location.
- Two floor drains were found after all equipment had been removed from the basement. Locations 21-612265 and 21-613173 were added to sample the floor drains (Figure 2.6-1).

All deviations are described in Appendix B, section B-8.0.

5.0 DATA REVIEW PROCESS

This section presents an overview of the data review process conducted for the investigation sites. The purpose of the data review is to determine whether the nature and extent of contamination are defined for each of the investigation sites and to identify COPCs. This process includes comparing the analytical results with BVs and/or FVs for inorganic chemicals and radionuclides (LANL 1998, 059730) and the detection status for organic chemicals. It also includes, for each site, the determination of the nature and extent of contamination and the COPCs.

Data review for each of the investigation sites includes historical data and data generated during this field investigation. Results of the data review (determination of the nature and extent of contamination and COPCs) are provided together with the site contamination (section 7) following presentation of the applicable regulatory criteria (section 6).

5.1 Nature and Extent Determination Methodology

For each site, analytical results are evaluated to determine whether lateral and vertical extent of contamination were defined. This is accomplished by (1) determining whether concentrations decrease vertically and laterally; (2) comparing inorganic chemical concentrations and radionuclide activities to BVs/FVs (LANL 1998, 059730); and (3) determining whether organic chemical concentrations are below the respective estimated quantitation limits (EQLs).

The data used to determine the nature and extent of contamination and the COPCs for the six investigation sites were from analyses of samples collected in 2010–2011. The sampling locations for the investigation sites are shown in Figures 2.2-1 through 2.7-1. The data are provided on DVD in Appendix C.

Sample media encountered during the 2010–2011 investigations include soil (all soil horizons, designated by the media code ALLH or SOIL) and Bandelier Tuff (media code Qbt 3—the only unit of Bandelier Tuff encountered during this investigation). Data collected previously at Consolidated Unit 21-004(b)-99 and AOC 21-028(d) are over 10 yr old and are not representative of current site conditions. Therefore, only data collected from these two sites in 2011 are presented and evaluated in this report.

Site data are evaluated by media type (soil, tuff) to facilitate the comparison with media-specific background data. Background data are available for soil (all soil horizons, designated by media code ALLH) and for Bandelier Tuff (media code Qbt 3).

In some cases, individual analytical results are qualified as "rejected" because of various data-quality issues. Rejected analytical results are not included in the data review or in evaluations of the nature and extent of contamination. Data-quality issues, including rejected analytical results, are presented in the analytical program appendix (Appendix F).

The extent of contamination is determined for inorganic chemicals and radionuclides by spatial analysis of concentrations above BVs or FVs and by detection for organic chemicals. For inorganic chemicals and radionuclides, statistical comparisons may be performed to determine whether site concentrations are comparable with background concentrations. If statistical comparisons cannot be conducted, concentrations are compared with the maximum background concentration for a given environmental medium. Across a site, extent is defined for inorganic chemicals whose concentrations are below BVs and radionuclides whose concentrations are below BVs/FVs or are not different from background/fallout. In addition, concentrations of certain naturally occurring inorganic chemicals (e.g., nitrate) that do not have established BVs might reflect naturally occurring concentrations and not a contaminant release.

Organic chemicals detected at or below the EQL for the analytical method are present at trace concentrations, and extent is defined. Extent is also defined when concentrations of inorganic chemicals, organic chemicals, or radionuclides decrease with depth (vertical extent) or with distance from the source of contamination lateral extent).

Once the nature and extent of inorganic chemicals, organic chemicals, and radionuclides have been defined for a site, COPCs are identified for that site. If nature and extent are not defined for all analytes, COPCs are not identified for that site and further investigation is recommended.

5.2 Identification of COPCs

For the sites addressed in this report, nature and extent have not been defined for all analytes (see section 7). Therefore, the identification of COPCs (including statistical analyses) is not presented for any of the sites.

6.0 REGULATORY CRITERIA

This section describes the criteria used for evaluating potential risk/dose to ecological and human receptors. Regulatory criteria identified by medium (soil, tuff, etc.) include cleanup standards, risk-based screening levels, and risk-based cleanup goals.

6.1 Current and Future Land Use

The specific screening levels used in the risk/dose evaluation and corrective action decision process at a site depend on the current and reasonably foreseeable future land use(s). The current and reasonably foreseeable future land use for a site determines the receptors and exposure scenarios used to select screening and cleanup levels. The land use within and surrounding the DP Delayed Sites and DP East building footprints is currently industrial and is expected to remain industrial for the reasonably foreseeable future. Additionally, the construction worker scenario is applicable, or potentially applicable, at all the sites. The residential scenario is evaluated for each site for comparison purposes per the Consent Order.

6.2 Risk-Screening Assessments

6.2.1 Human Health Screening Assessments

If nature and extent are defined for a site, human health screening assessments are conducted for inorganic and organic COPCs using NMED soil screening levels (SSLs) for industrial, construction worker, and residential scenarios (NMED 2009, 108070). Radionuclides are assessed using the Laboratory screening action levels (SALs) (LANL 2009, 107655). When an NMED SSL is not available for a COPC, SSLs are obtained from the EPA regional tables (http://www.epa.gov/region09/superfund/prg/) (adjusted to a risk level of 10^{-5} for carcinogens). Surrogate SSLs are used for some COPCs for which no SSLs are available, based on structural similarity or breakdown products.

6.2.2 Ecological Screening Assessments

If nature and extent are defined for a site, ecological risk-screening assessments are conducted using ecological screening levels (ESLs) obtained from the ECORISK Database, Version 3.0 (LANL 2011, 206473). 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 3.0 (LANL 2011, 206473).

6.3 Cleanup Standards

As specified in 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/or reasonably foreseeable future land use. Screening assessments compare concentrations for each site with industrial, residential, and construction worker SSLs and SALs.

The cleanup goals specified in the Consent Order are a target risk of 10^{-5} for carcinogens and a hazard index of 1 for noncarcinogens. For radionuclides, the target dose is 15 mrem/yr based on DOE guidance (DOE 2000, 067489). The SSLs and SALs used in risk/dose screening assessments are based on these cleanup goals.

7.0 SITE CONTAMINATION

Provided in this section for each of the six investigation sites are summaries of the analytical laboratory results for the soil and tuff samples collected and the analysis of the nature and extent of contamination. A total of 494 samples (including field duplicates, rinsate blanks, and trip blanks) were collected during the investigation and analyzed for chemicals and radionuclides in accordance with the approved investigation work plans (LANL 2009, 108166.9; NMED 2010, 108443; LANL 2010, 110082.4; NMED

2010, 110422). The detailed analytical results for each sample collected at the investigation sites are provided on DVDs (Appendix C).

7.1 Overview of Data

The data used for determining the nature and extent of contamination for the investigation sites were from analyses of samples collected in 2010–2011 and are presented in Tables 7.1-1 through 7.1-24.

7.1.1 Consolidated Unit 21-004(b)-99, Aboveground Storage Tanks and Former Outfall

7.1.1.1 Analytical Results

Decision-level data at Consolidated Unit 21-004(b)-99 consist of results from 13 soil and 10 tuff samples collected from 10 locations in 2011 The results are shown in Figures 7.1-1 through 7.1-3 and are presented in Tables 7.1-1 through 7.1-4.

Inorganic Chemicals

Twenty-three samples (13 soil and 10 tuff) were analyzed for TAL metals, nitrate, perchlorate, and total cyanide. Table 7.1-2 presents the results of the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs. Figure 7.1-1 shows the spatial distribution of inorganic chemicals detected or detected above BVs. Because the extent of contamination is not defined for the site, inorganic COPCs have not been identified.

Organic Chemicals

Twenty-three samples (13 soil and 10 tuff) were analyzed for SVOCs. Fifteen of the 23 samples were also analyzed for VOCs; 6 of the 23 samples were analyzed for explosive compounds and dioxins/furans; and 7 of the 23 were analyzed for PCBs. Table 7.1-3 presents the detected organic chemicals. Figure 7.1-2 shows the spatial distribution of detected organic chemicals. Because the extent of contamination is not defined for the site, organic COPCs have not been identified.

Radionuclides

Twenty-three samples (13 soil and 10 tuff) were analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, isotopic thorium, strontium-90, technetium-99, and tritium. Table 7.1-4 presents the radionuclides detected or detected above BVs/FVs. Figure 7.1-3 shows the spatial distribution of radionuclides detected or detected above BVs/FVs. Because the extent of contamination is not defined for the site, radionuclide COPCs have not been identified.

7.1.1.2 Nature and Extent of Soil and Rock Contamination

Inorganic Chemicals

Aluminum was detected above the Qbt 3 BV (7340 mg/kg) in one sample at location 21-614328 from 5–6 ft bgs. The aluminum concentration (7380 mg/kg) was below the maximum Qbt 3 background concentration (8370 mg/kg). The concentrations decreased with depth at this location because the concentration in the shallower sample was below the soil BV but above the concentration in the deeper tuff sample (Appendix C, Table C-1). The concentrations decreased laterally and downslope of the outfall. Therefore, the lateral and vertical extent of aluminum are defined.

Antimony was detected above the Qbt 3 BV (0.5 mg/kg) in two samples at location 21-614326. Its concentrations were below the estimated detection limits (DLs) in the deeper depths. Therefore, the lateral and vertical extent of antimony are defined.

Barium was detected above the Qbt 3 BV (46 mg/kg) in five samples at five locations. The maximum concentration in tuff (107 mg/kg) was detected at location 21-614325 from 2–3 ft bgs. The concentrations of barium increased with depth at location 21-614325 and increased laterally to the east. Barium concentrations decreased with depth at location 21-614327 and decreased downslope of the outfall. Barium concentrations in the shallower samples at locations 21-614322, 21-614324, and 21-614328 were below the soil BV but similar to the concentrations in the deeper tuff samples (Appendix C, Table C-1). Therefore, the lateral and vertical extent of barium are not defined.

Cadmium was not detected above the BV but had DLs (0.478 mg/kg to 0.557 mg/kg) above the soil BV (0.4 mg/kg) in 13 samples at nine locations. Cadmium was not detected above the BV, and all results reported between the BV and the maximum DL were nondetects. Therefore, the lateral and vertical extent of cadmium are defined.

Calcium was detected above the soil BV (6120 mg/kg) in one sample at location 21-614326 from 0.5–1.5 ft bgs and had DLs above the soil or Qbt 3 BV at three locations. Calcium concentrations decreased with depth at location 21-614326, and DLs decreased to below BV at locations 21-614327 and 21-614328. The DL was above the Qbt 3 BV at the deeper depth at location 21-614325 and was not detected in the shallower sample. There are no documented releases from the bermed area. The bermed area would have contained any small leaks that may have occurred. Therefore, the lateral and vertical and extent of calcium are defined.

Chromium was detected above the Qbt 3 BV (7.14 mg/kg) in six samples at four locations. The maximum concentration in tuff (112 mg/kg) was detected at location 21-614328 from 5–6 ft bgs. Chromium concentrations increased with depth at locations 21-614326 and 21-614328. Chromium concentrations decreased with depth at location 21-614329. Chromium was detected (8.97 mg/kg) below the maximum Qbt 3 background concentration (13 mg/kg) at location 21-614327. Chromium concentrations decreased downslope of the outfall. Therefore, the lateral extent of chromium is defined, but the vertical extent is not defined.

Copper was not detected above the BV but had DLs (4.75 to 20.5 mg/kg) above the Qbt 3 BV (4.66 mg/kg) in six samples at four locations. Copper was not detected above BV, and all results reported between the BV and the maximum DL were nondetects. Therefore, the lateral and vertical extent of copper are defined.

Iron was detected above the Qbt 3 BV (14,500 mg/kg) in one sample at location 21-614328 from 5–6 ft bgs. This concentration (17,600 mg/kg) was below the maximum Qbt 3 background concentration (19,500 mg/kg). The concentrations of iron decreased downslope and laterally from this location. Therefore, the lateral and vertical extent of iron are defined.

Lead was detected above the Qbt 3 BV (11.2 mg/kg) in two samples at two locations. The maximum concentration (12.1 mg/kg) was detected at location 21-614325 from 2–3 ft bgs. Lead concentrations were below the maximum Qbt 3 background concentration (15.5 mg/kg) at both locations. The concentrations decreased with depth at location 21-614327. The concentrations decreased downslope from the outfall and were less than the maximum Qbt 3 background concentration laterally at the outfall. Therefore, the lateral and vertical extent of lead are defined.

Magnesium was not detected above the BV but had one DL (2520 mg/kg) above the Qbt 3 BV (1690 mg/kg) in one sample at location 21-614328. The DL is below the maximum Qbt 3 background concentration (2820 mg/kg). Magnesium was not detected above BV, and all results reported between the BV and the maximum DL were nondetects. Therefore, the lateral and vertical extent of magnesium are defined.

Mercury was detected above the soil BV (0.1 mg/kg) in five samples at four locations. Mercury concentrations decreased with depth at these locations. The concentrations decreased downslope from the outfall and were equivalent to the BV laterally at the outfall. Therefore, the lateral and vertical extent of mercury are defined.

Nickel was detected above the Qbt 3 BV (6.58 mg/kg) in five samples at three locations. The maximum concentration (22.9 mg/kg) was detected at location 21-614328 from 5–6 ft bgs. The concentrations increased with depth at location 21-614328 and remained essentially the same with depth at locations 21-614326 and 21-614329. The concentrations decreased downslope of the outfall and laterally. Therefore, the lateral extent of nickel is defined, but the vertical extent is not defined.

Nitrate was detected in four soil samples at two locations. The detected concentrations of nitrate (maximum 1.69 mg/kg) likely reflect naturally occurring levels. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected in six soil samples at three locations. The maximum concentration (0.00217 mg/kg) was detected at location 21-614323 from 0–0.5 ft bgs. The concentrations of perchlorate decreased with depth at location 21-614323 and were below EQLs at the other two locations. The concentrations decreased downslope and to the east. The concentrations increased laterally to the west of the outfall. Therefore, the lateral extent of perchlorate is not defined, but the vertical extent is defined.

Selenium was not detected above the BVs but had DLs (0.935 mg/kg to 1.06 mg/kg) above the Qbt 3 BV (0.3 mg/kg) in 10 samples at seven locations. Selenium was not detected above BV, and all results reported between the BV and the maximum DL were nondetects. Therefore, the lateral and vertical extent of selenium are defined.

Silver was detected at seven locations above the soil BV (1 mg/kg) in eight samples at six locations and above the Qbt 3 BV (1 mg/kg) in six samples at six locations. The maximum concentration detected in tuff (2.53 mg/kg) was at location 21-614328 from 5–6 ft bgs. The maximum concentration detected in soil (3.28 mg/kg) was at location 21-614328 from 0–1 ft bgs. Silver concentrations were below the maximum Qbt 3 background concentration (1.9 mg/kg) at locations 21-614322, 21-614324, 21-614325, 21-614327, and 21-614329. The concentrations of silver decreased with depth at locations 21-614321, 21-614327, and 21-614328 and decreased downslope and laterally from the center of the outfall. Therefore, the lateral and vertical extent of silver are defined.

Zinc was detected above the soil BV (48.8 mg/kg) in two samples at two locations. Its concentrations decreased with depth at location 21-614321. The detected concentrations of zinc was below the maximum soil background concentration (75.5 mg/kg) at both locations. The concentrations of zinc decreased downslope and laterally from the outfall. Therefore, the lateral and vertical extent of zinc are defined.

Organic Chemicals

Acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, and/or pyrene were detected in eight samples at six locations. Their concentrations decreased with depth, remained essentially the same with depth, or were below the EQLs. The concentrations decreased downslope of the outfall and laterally at the outfall. Therefore, the lateral and vertical extents of these organic chemicals are defined.

Acetone was detected in five samples at four locations. The concentrations of acetone were below the EQL at location 21-614325 and increased with depth at locations 21-614321, 21-614328, and 21-614329. There are no documented releases from the bermed area. The bermed area would have contained any small leaks that may have occurred. Therefore, the lateral extent of acetone is defined, but vertical extent is not defined.

Aroclor-1254 and/or Aroclor-1260 were detected in three samples from three locations. Aroclor-1254 concentrations were below the EQL at location 21-614329. Aroclor-1254 and Aroclor-1260 concentrations increased with depth at location 21-614328. Only the bottom depth at location 21-614326 was analyzed for PCBs, and they were detected. There are no documented releases from the bermed area. The bermed area would have contained any small leaks that may have occurred. Therefore, the lateral extent of Aroclor-1254 and Aroclor-1260 is defined, but the vertical extent is not defined.

Butanone[2-], propylbenzene[1-], and xylene[1,3-]+xylene[1,4-] were detected in one sample at location 21-614328 from 5–6 ft bgs. The concentrations were below the EQLs. Therefore, the lateral and vertical extent of butanone[2-], propylbenzene[1-], and xylene[1,3-]+xylene[1,4-] are defined.

Diethylphthalate was detected in four samples at two locations. The concentrations were below the EQL at both locations. Therefore, the lateral and vertical extent of diethylphthalate are defined.

The dioxins/furans heptachlorodibenzodioxin[1,2,3,4,6,7,8-], heptachlorodibenzofuran[1,2,3,4,6,7,8-], hexachlorodibenzodioxin[1,2,3,6,7,8-], octachlorodibenzodioxin[1,2,3,4,6,7,8,9-], and/or octachlorodibenzofuran[1,2,3,4,6,7,8,9-]) were detected in four samples at two locations. The concentrations decreased with depth at location 21-614329 and remained essentially the same with depth at location 21-614328. Their concentrations decreased downslope of the outfall and laterally at the outfall. Therefore, the lateral and vertical extent of dioxins/furans are defined.

Isopropyltoluene[4-] was detected in five samples at four locations. The concentrations of isopropyltoluene[4-] decreased with depth at location 21-613329, increased with depth at locations 21-614322, 21-614325, and 21-614328, and decreased downslope of the outfall and laterally at the outfall. Therefore, the lateral extent of isopropyltoluene[4-] is defined, but the vertical extent is not defined.

Tetrachloroethene and toluene were detected in two samples at two locations. The detected concentrations were below the EQLs at both locations. Therefore, the lateral and vertical extent of tetrachloroethene and toluene are defined.

Radionuclides

Americium-241 was detected in eight samples at six locations. The maximum activity was 0.112 pCi/g at location 21-614324 from 0–1 ft bgs. Activities decreased with depth at four locations and increased with depth at locations 21-614321 and 21-614328. Activities decreased downslope and laterally at the outfall area. Therefore, the lateral extent of americium-241 is defined, but the vertical extent is not defined.

Cesium-137 was detected under the western tank downslope of the outfall area at location 21-614326 from 0.5–1.5 ft bgs. Activities decreased with depth at this location. The lateral extent is defined downslope of this area because the activity detected is less than the soil FV (1.65 pCi/g). Therefore, the lateral and vertical extent of cesium-137 are defined.

Plutonium-239/240 was detected in 15 samples at nine locations. The maximum activity was 1.87 pCi/g at location 21-614321 from 0–0.5 ft bgs. Activities decreased with depth at seven locations and increased with depth at locations 21-614319 and 21-614325. Activities decreased downslope and laterally at the outfall area. Therefore, the lateral extent of plutonium-239/240 is defined, but the vertical extent is not defined.

Tritium was detected in 23 samples at 10 locations. The maximum activity was 9.02 pCi/g at location 21-614328 from 5–6 ft bgs. Tritium activities decreased with depth at three locations and increased with depth at locations 21-614321, 21-614323, 21-614324, 21-614325, 21-614326, 21-614328, and 21-614329. Tritium activities decreased downslope and laterally at the outfall area. Therefore, the lateral extent of tritium is defined, but the vertical extent is not defined.

Uranium-235/236 was detected above the Qbt 3 BV (0.09 pCi/g) in one sample at location 21-614327. The maximum activity (0.0923 pCi/g) was detected from 2–3 ft bgs. Activities decreased with depth. The activity of uranium-235/236 was equivalent to the Qbt 3 BV and likely reflects the natural variability in tuff. Therefore, the lateral and vertical extent of uranium-235/236 are defined.

Summary of Nature and Extent

The lateral and vertical extent of barium is not defined. The lateral extent of perchlorate is not defined. The vertical extent of chromium, nickel, acetone, Aroclor-1254, Aroclor-1260, isopropyltoluene[4-], americium-241, plutonium-239/240, and tritium is not defined.

7.1.2 SWMU 21-011(b), Acid Waste Lines and Sump

7.1.2.1 Analytical Results

Decision-level data at SWMU 21-011(b) consist of results from 22 soil and 28 tuff samples collected from 25 locations in 2011. The results are shown on Plates 1 through 3 and are presented in Tables 7.1-5 through 7.1-8.

Inorganic Chemicals

Fifty samples (22 soil and 28 tuff) were analyzed for TAL metals, nitrate, perchlorate, and total cyanide. Table 7.1-6 presents the results of the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs. Plate 1 shows the spatial distribution of inorganic chemicals detected or detected above BVs. Because the extent of contamination is not defined for the site, inorganic COPCs have not been identified.

Organic Chemicals

Fifty samples (22 soil and 28 tuff) were analyzed for SVOCs and VOCs. Six of the 50 samples were analyzed for explosive compounds, dioxins/furans, and PCBs. Table 7.1-7 presents the detected organic chemicals. Plate 2 shows the spatial distribution of detected organic chemicals. Because the extent of contamination is not defined for the site, organic COPCs have not been identified.

Radionuclides

Fifty samples (22 soil and 28 tuff) were analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, technetium-99 and tritium. Forty-six samples (19 soil and 27 tuff) were analyzed for isotopic thorium. Table 7.1-8 presents the radionuclides detected or detected above BVs/FVs. Plate 3 shows the spatial distribution of radionuclides detected or detected above BVs/FVs. Because the extent of contamination is not defined for the site, radionuclide COPCs have not been identified.

7.1.2.2 Nature and Extent of Soil and Rock Contamination

Lateral extent beyond the waste line footprint is not applicable because contamination from the waste line would have traveled vertically and not laterally (gravity flow). Therefore, the lateral extent is defined for SWMU 21-011(b), and the discussion below addresses only the vertical extent of inorganic chemicals, organic chemicals, and radionuclides.

Inorganic Chemicals

Aluminum was detected above the Qbt 3 BV (7340 mg/kg) in two samples at two locations. The maximum concentration (8470 mg/kg) was detected at location 21-613821 from 4–5 ft bgs. The concentrations decreased with depth at location 21-613821 and remained essentially the same at location 21-613826. The concentration of aluminum in the shallower sample at location 21-613826 was below the soil BV but similar to the concentration in the deeper tuff sample (Appendix C, Table C-1). Therefore, the vertical extent of aluminum is defined.

Antimony was not detected above the BVs but had DLs (0.524 mg/kg to 1.16 mg/kg for tuff and 0.878 to 1.25 mg/kg for soil) above the tuff and soil BVs (0.5 mg/kg and 0.83 mg/kg, respectively) in 46 samples at 25 locations. Antimony was not detected above BV, and all results reported between the BV and the maximum DL were nondetects. Therefore, the vertical extent of antimony is defined.

Barium was detected above the Qbt 3 BV (46 mg/kg) in 10 samples at eight locations. The concentrations of barium decreased with depth at all locations. The concentrations in the shallower samples at locations 21-613816 and 21-613826 were below the soil BV but above the concentration in the deeper tuff sample (Appendix C, Table C-1). Barium concentrations were below the maximum Qbt 3 background concentration (51.6 mg/kg) at locations 21-613818 and 21-613820. Therefore, the vertical extent of barium is defined.

Beryllium was detected above the Qbt 3 BV (1.21 mg/kg) in one sample at location 21-613826 from 6–7 ft bgs and slightly above the soil BV (1.83 mg/kg) in one sample at location 21-613816 from 7–8 ft bgs. The concentration of beryllium decreased with depth at location 21-613816. Beryllium concentrations were below the Qbt 3 and soil maximum background concentrations (1.8 and 3.95 mg/kg, respectively) at locations 21-613816 and 21-613826. Therefore, the vertical extent of beryllium is defined.

Cadmium was not detected above the BV but had DLs (0.471 mg/kg to 0.598 mg/kg) above the soil BV (0.4 mg/kg) in 20 samples at 14 locations. Cadmium was not detected above BV, and all results reported between the BV and the maximum DL were nondetects. Therefore, the vertical extent of cadmium is defined.

Calcium was detected at seven locations above the Qbt 3 BV (2200 mg/kg) in six samples at four locations and above the soil BV (6120 mg/kg) in three samples at three locations. The concentrations of calcium decreased with depth at four locations. The concentration in the shallower sample at location 21-613816 was below the soil BV but above the concentration in the deeper tuff sample (Appendix C, Table C-1). The concentrations of calcium at location 21-613821 remained essentially the same with depth, both below (shallowest depth) and above (deepest depth) the maximum Qbt 3 background concentration (2230 mg/kg). The concentrations were below the maximum soil background concentration (14,000 mg/kg) at locations 21-613827, 21-613834, and 21-613839 and increased at depth at location 21-613825. Therefore, the vertical extent of calcium is not defined at location 21-613825.

Chromium was detected at eight locations above the Qbt 3 BV (7.14 mg/kg) in 10 samples at seven locations and above the soil BV (19.3 mg/kg) in 1 sample at location 21-613847. The maximum concentration in tuff (30.1 mg/kg) was detected at location 21-613836 from 10–11 ft bgs. The maximum concentration in soil (20.2 mg/kg) was detected at location 21-613847 from 8–9 ft bgs. At location 21-613813, concentrations decreased with depth because the concentration in the shallower sample was below the soil BV but above the concentration in the deeper tuff sample (Appendix C, Table C-1). At location 21-613816, chromium concentrations remained essentially the same with depth; the concentration in the shallower sample was below the soil BV but similar to the concentration in the deeper tuff sample (Appendix C, Table C-1). At location 21-613836, concentrations decreased with depth. The concentrations were below the maximum Qbt 3 background concentration (13 mg/kg) at locations 21-613813, 21-613816, 21-613819, and 21-613820, and the concentration was below the maximum soil background concentration (36.5 mg/kg) at location 21-613847. Therefore, the vertical extent of chromium is defined.

Cobalt was detected above the soil BV (8.64 mg/kg) in one sample at location 21-613838 from 9–10 ft bgs. This concentration of cobalt was below the maximum soil background concentration (9.5 mg/kg). Therefore, the vertical extent of cobalt is defined.

Copper was detected at six locations above the Qbt 3 BV (4.66 mg/kg) in six samples at four locations and above the soil BV (14.7 mg/kg) in two samples at two locations. The maximum concentration in tuff (5.65 mg/kg) was detected at location 21-613816 from 9–10 ft bgs. The maximum concentration in soil (23.2 mg/kg) was detected at location 21-613834 from 1–2 ft bgs. The concentrations of copper decreased with depth at locations 21-613834 and 21-613847. The concentrations at locations 21-613816, 21-613821, 21-613826, and 21-613836 were below the maximum Qbt 3 background concentration (6.2 mg/kg). The concentration at location 21-613847 was approximately equivalent to the maximum soil background concentration (16 mg/kg). The copper concentrations in the shallower samples were below the soil BV but above the concentrations in the deeper tuff sample at locations 21-613816 and 21-613826 (Appendix C, Table C-1). The concentrations at these two locations were also below the maximum Qbt 3 background concentration. Therefore, the vertical extent of copper is defined.

Total cyanide was detected above the soil BV (0.5 mg/kg) in one sample at location 21-613816 from 7–8 ft bgs. The concentrations of total cyanide decreased with depth. Therefore, the vertical extent of total cyanide is defined.

Lead was detected above the Qbt 3 BV (11.2 mg/kg) in four samples at three locations. The maximum concentration (16.3 mg/kg) was detected at location 21-613825 from 4–5 ft bgs. The concentrations of lead decreased with depth at three locations. The concentrations in the shallower samples were below the soil BV but above the concentrations in the deeper tuff sample at locations 21-613816 and 21-613829 (Appendix C, Table C-1). Lead concentrations were below the maximum Qbt 3 background concentration (15.5 mg/kg) at locations 21-613816 and 21-613829. Therefore, the vertical extent of lead is defined.

Magnesium was detected above the Qbt 3 BV (1690 mg/kg) in one sample at location 21-613821 from 4–5 ft bgs. The concentrations decreased with depth. The magnesium concentration was below the maximum Qbt 3 background concentration (2820 mg/kg) at this location. Therefore, the vertical extent of magnesium is defined.

Manganese was detected above the soil BV (671 mg/kg) in one sample at location 21-613838 from 9–10 ft. The concentration was below the maximum soil background concentration (1100 mg/kg). The manganese concentration was below the maximum soil background concentration (752 mg/kg) at location 21-613838. The concentration (741 mg/kg) was above the construction worker SSL. Therefore, the vertical extent of manganese is defined.

Mercury was detected at six locations above the Qbt 3 BV (0.1 mg/kg) in one sample at location 21-613819 and above the soil BV (0.1 mg/kg) in five samples at five locations. The maximum concentration detected in tuff (0.145 mg/kg) was at location 21-613819 from 5–6 ft bgs. The maximum concentration detected in soil (0.258 mg/kg) was at location 21-613827 from 6–7 ft bgs. The concentrations of mercury decreased with depth at four locations and was essentially the same as the soil BV at location 21-613849 (0.116 mg/kg). The concentrations of mercury increased with depth at location 21-613827. Therefore, the vertical extent of mercury is not defined at location 21-613827.

Nickel was detected above the Qbt 3 BV (6.58 mg/kg) in four samples at three locations. The concentrations of nickel decreased with depth two locations. The concentrations in the shallower samples were below the soil BV but above the concentrations in the deeper tuff sample at locations 21-613816 and 21-613826 (Appendix C, Table C-1). The concentrations increased with depth at location 21-613821. Therefore, the vertical extent of nickel is not defined at location 21-613821.

Nitrate was detected in 22 tuff samples at 15 locations and 20 soil samples at 14 locations. All the detected concentrations of nitrate (maximum 10.3 mg/kg) likely reflect naturally occurring levels. Therefore, the vertical extent of nitrate is defined.

Perchlorate was detected at in two tuff samples at two locations and five soil samples at four locations. The concentrations decreased with depth at three locations and increased with depth at location 21-613826. At location 21-613827, the concentration detected in the deepest sample was essentially equivalent to the EQL (0.0029 mg/kg versus 0.0022 mg/kg). Therefore, the vertical extent of perchlorate is defined.

Selenium was detected above the Qbt 3 BV (0.3 mg/kg) in one sample at location 21-613813 from 6–7 ft bgs. Selenium DLs (0.952 mg/kg to 1.14 mg/kg) were above the Qbt 3 BV in 27 samples. The concentrations at location 21-613813 increased with depth. Therefore, the vertical extent of selenium is not defined.

Silver was not detected above the BV but had a DL (2.35 mg/kg) above the soil BV (1 mg/kg) in one sample at location 21-613847 from 6–7 ft bgs. Silver was not detected above BV, and all results reported between the BV and the maximum DL were nondetects. Therefore, the vertical extent of silver is defined.

Zinc was detected above the soil BV (48.8 mg/kg) in one sample at location 21-613827 from 4–5 ft bgs. The concentrations decreased with depth at this location. Therefore, the vertical extent of zinc is defined.

Organic Chemicals

Acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, and/or pyrene were detected in 24 samples at 18 locations. The concentrations decreased with depth and/or were below EQLs at all locations, except at locations

21-613813, 21-613837, 21-613847, and 21-613849. The concentrations of most polycyclic aromatic hydrocarbons (PAHs) increased with depth at these locations. Therefore, the vertical extent of PAHs is not defined.

Acetone was detected in seven samples at five locations. The concentrations decreased with depth at locations 21-613836, 21-613837, and 21-613848 and were below the EQLs at all locations. Therefore, the vertical extent of acetone is defined.

Aroclor-1254 was detected in two samples at location 21-613849 from 2–3 ft bgs and 4–5 ft bgs. It was detected below the EQL in the deepest depth sampled (4–5 ft bgs). Therefore, the vertical extent of Aroclor-1254 is defined.

Bis(2-ethylhexyl)phthalate was detected in two samples at two locations. The concentrations decreased with depth at both locations. Therefore, the vertical extent of bis(2-ethylhexyl)phthalate is defined.

Diethylphthalate was detected in one sample at location 21-613813 from 6–7 ft bgs. The concentrations increased with depth at this location. Therefore, the vertical extent of diethylphthalate is not defined.

The dioxins/furans heptachlorodibenzodioxin[1,2,3,4,6,7,8-], heptachlorodibenzofuran[1,2,3,4,6,7,8-], and hexachlorodibenzodioxin[1,2,3,6,7,8-] were detected in two samples at one location. Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-] was detected in six samples at three locations. Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-] concentrations were below EQLs at locations 21-613847 and 21-613848. The concentrations of all congeners increased with depth at location 21-613849. Therefore, the vertical extent of dioxins/furans is not defined.

Hexanone[2-] was detected in one sample at location 21-613825 from 6–7 ft bgs. The concentrations increased with depth at this location. Therefore, the vertical extent of hexanone[2-] is not defined.

Isopropyltoluene[4-] was detected in one sample at location 21-613814 from 6–7 ft bgs. The concentrations decreased with depth at this location. Therefore, the vertical extent of isopropyltoluene[4-] is defined.

Methylene chloride was detected in one sample at location 21-613839 from 5–6 ft bgs. The concentrations decreased with depth. Therefore, the vertical extent of methylene chloride is defined.

Radionuclides

Americium-241 was detected in 14 samples at 12 locations. The maximum activity of 40.6 pCi/g exceeded the construction worker and residential SALs at location 21-613847 from 6–7 ft bgs. Activities decreased with depth at all locations, except at locations 21-613813 and 21-613838, where the activities increased with depth. Therefore, the vertical extent of americium-241 is not defined.

Cesium-137 was detected in two samples at two locations. The maximum activity was 0.209 pCi/g at 21-613826 from 4–5 ft bgs. Activities decreased with depth at both locations. Therefore, the vertical extent cesium-137 is defined.

Plutonium-238 was detected in two samples at two locations. The maximum activity was 0.0299 pCi/g at location 21-613825 from 4–5 ft bgs. Activities decreased with depth at the two locations. Therefore, the vertical extent of plutonium-238 is defined.

Plutonium-239/240 was detected in 30 samples at 19 locations. The maximum activity of 1620 pCi/g exceeded the construction worker, industrial, and residential SALs at location 21-613847 from 6–7 ft bgs.

Plutonium activities decreased with depth at all locations, except at locations 21-613814, 21-613828, and 21-613838 where activities increased with depth. Therefore, the vertical extent of plutonium-239/240 is not defined.

Thorium-228 was detected in one soil sample at essentially the same activity as the BV (2.28 pCi/g) at location 21-613814 from 8–9 ft bgs. Therefore, the vertical extent of thorium-228 is defined.

Tritium was detected in 49 samples at 25 locations. The maximum activity of 1563 pCi/g exceeded the residential SAL at location 21-613826 from 4–5 ft bgs. Activities decreased with depth at 10 locations. Activities remained essentially the same with depth at locations 21-613814, 21-613818, 21-613820, 21-613821, 21-613828, 21-613834, 21-613835, 21-613836, and 21-613837. Activities increased with depth at locations 21-613822, 21-613827, 21-613838, 21-613839, 21-613848, and 21-613849. Therefore, the vertical extent of tritium is not defined.

Uranium-235/236 was detected slightly above the Qbt 3 BV (0.09 pCi/g) in two samples at two locations. The activities (0.0949 pCi/g and 0.0903 pCi/g) were equivalent to the BV. Therefore, the vertical extent of uranium-235/236 is defined.

Summary of Nature and Extent

The vertical extent of calcium, mercury, nickel, selenium, diethylphthalate, dioxins/furans, hexanone[2-], PAHs, americium-241, plutonium-239/240, and tritium is not defined.

7.1.3 Former Building 21-152 and Associated Former Structures Footprints

7.1.3.1 Analytical Results

Decision-level data for the footprints of former building 21-152 and associated structures consist of results from 37 soil and 93 tuff samples collected in 2011 from 61 locations. The results are shown on Plates 4 through 6 and are presented in Tables 7.1-9 through 7.1-12.

Inorganic Chemicals

A total of 124 samples (35 soil and 89 tuff) were analyzed for TAL metals, nitrate, perchlorate, and total cyanide. Table 7.1-10 presents the results of the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs. Plate 4 shows the spatial distribution of inorganic chemicals detected or detected above BVs. Because the extent of contamination is not defined for the site, inorganic COPCs have not been identified.

A total of 86 samples were analyzed for asbestos. Asbestos was not detected in any of the samples (Appendix C).

Organic Chemicals

A total of 115 samples (33 soil and 82 tuff) were analyzed for SVOCs and VOCs. Twenty-six of the 115 samples were analyzed for explosive compounds, dioxins/furans, and PCBs. Seven of the 115 samples were analyzed for TPH-DRO and TPH-gasoline range organics. Table 7.1-11 presents the detected organic chemicals. Plate 5 shows the spatial distribution of detected organic chemicals. Because the extent of contamination is not defined for the site, organic COPCs have not been identified.

Radionuclides

A total of 124 samples (35 soil and 89 tuff) were analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, isotopic thorium, strontium-90, and tritium. A total of 123 samples (35 soil and 88 tuff) were analyzed for technetium-99. Table 7.1-12 presents the radionuclides detected or detected above BVs/FVs. Plate 6 shows the spatial distribution of radionuclides detected or detected above BVs/FVs. Because the extent of contamination is not defined for the site, radionuclide COPCs have not been identified.

7.1.3.2 Nature and Extent of Soil and Rock Contamination

Samples collected from the footprints of former building 21-152 and associated structures address only the vertical extent of contamination. Lateral extent beyond the building footprint is not applicable because contamination from the building drains/waste lines/laboratory areas would have traveled vertically and not laterally (gravity flow). Therefore, lateral extent is defined for former building 21-152 and associated former structures, and the discussion below addresses only the vertical extent of inorganic chemicals, organic chemicals, and radionuclides.

Inorganic Chemicals

Aluminum was detected above the Qbt 3 BV (7340 mg/kg) in seven samples at seven locations. The maximum concentration (17,800 mg/kg) was detected at location 21-614192 from 8–9 ft bgs. The concentrations of aluminum decreased with depth at locations 21-614187, 21-614213, and 21614236. The concentrations in the shallower samples at these three locations were below the soil BV but above the concentrations in the deeper tuff samples (Appendix C, Table C-1). The aluminum concentration was below the maximum Qbt 3 background concentration (8370 mg/kg) at location 21-614187. The concentrations of aluminum increased with depth at locations 21-614192, 21-614206, 21-614211, and 21-614216. Therefore, the vertical extent of aluminum is not defined.

Antimony was detected at seven locations above the Qbt 3 BV (0.5 mg/kg) in eight samples at five locations and above the soil BV (0.83) in three samples at two locations. The maximum concentration in tuff (4.2 mg/kg) was detected at location 21-614222 from 5–6 ft bgs. The maximum concentration in soil (1.54 mg/kg) was detected at location 21-614229 from 7–8 ft bgs. The concentrations of antimony decreased with depth at locations 21-614184 and 21-614228 and remained essentially the same with depth at locations 21-614185 and 21-614229. The concentrations increased with depth at locations 21-614186, 21-614187, and 21-614222. Additionally, antimony DLs (0.501 mg/kg to 2.41 mg/kg) were above the BV in 95 samples. Therefore, the vertical extent of antimony is not defined.

Barium was detected at 25 locations above the Qbt 3 BV (46 mg/kg) in 27 samples at 23 locations and above the soil BV (295 mg/kg) in 2 samples at 2 locations. The maximum concentration in tuff (243 mg/kg) was detected at location 21-614206 from 8–9 ft bgs. The maximum concentration in soil (486 mg/kg) was detected at location 21-614221 from 3–4 ft bgs. The concentrations of barium decreased with depth at 10 locations. The concentrations in the shallower samples at locations 21-614187, 21-614212, 21-614213, 21-614216, 21-614226, 21-614233, 21-614234, and 21-614236 were below the soil BV but above the concentrations in the deeper tuff samples (Appendix C, Table C-1). Barium concentrations were below the maximum Qbt 3 background concentration (51.6 mg/kg) at locations 21-614198 and 21-614213. The detected concentrations were below the barium soil maximum background concentration (410 mg/kg) at location 21-614217 and increased with depth at locations 21-614192, 21-614206, 21-614211, 21-614219, 21-614221, and 21-614232. Therefore, the vertical extent of barium is not defined.

Beryllium was detected above the Qbt 3 BV (1.21 mg/kg) in two samples at two locations. Beryllium concentrations increased with depth at location 21-614236. The concentration of beryllium at location 21-614192 was below the maximum Qbt 3 background concentration (1.8 mg/kg). Therefore, the vertical extent of beryllium is not defined at location 21-614236.

Cadmium was not detected above the BV but had DLs (0.487 mg/kg to 0.606 mg/kg) above the soil BV (0.4 mg/kg) in 33 samples at 26 locations. Cadmium was not detected above the BV, and all results reported between the BV and the maximum DL were nondetects. Therefore, the vertical extent of cadmium is defined.

Calcium was detected at 29 locations above the Qbt 3 BV (2200 mg/kg) in 25 samples at 20 locations and above the soil BV (6120 mg/kg) in 15 samples at 15 locations. The maximum concentration in tuff (19,700 mg/kg) was detected at location 21-614222 from 5–6 ft bgs. The maximum concentration in soil (21,000 mg/kg) was detected at location 21-614220 from 1–2 ft bgs. The concentrations of calcium decreased with depth at 21 locations. The concentration in the shallower sample at location 21-614216 was below the soil BV but above the concentration in the deeper tuff sample (Appendix C, Table C-1). The detected concentrations were below the maximum soil background concentration (14,000 mg/kg) at locations 21-614210, 21-614211, 21-614214, 21-614215, 21-614221, 21-614229, and 21-614239. The concentrations remained essentially the same with depth at location 21-614192; the concentration in the shallower sample was below the soil BV but similar to the concentration in the deeper tuff sample (Appendix C, Table C-1). The concentrations of calcium increased with depth at locations 21-614183, 21-614222, 21-614232, and 21-614236. Therefore, the vertical extent of calcium is not defined.

Chromium was detected at 31 locations above the Qbt 3 BV (7.14 mg/kg) in 36 samples at 29 locations and above the soil BV (19.3 mg/kg) in 5 samples at 4 locations. The maximum concentration in tuff (41.1 mg/kg) was detected at location 21-614207 from 6–7 ft bgs. The maximum concentration in soil (38.6 mg/kg) was detected at location 21-614229 from 7–8 ft bgs. The concentrations of chromium decreased with depth at 15 locations. The concentrations in the shallower samples at locations 21-614213 and 21-614216 were below the soil BV but above the concentrations in the deeper tuff samples (Appendix C, Table C-1). Chromium was detected at or below the maximum Qbt 3 background concentration (13 mg/kg) at locations 21-614182, 21-614183, 21-614187, 21-614205, 21-614206, 21-614209, 21-614213, 21-614216, 21-614222, 21-614224, 21-614233, 21-614238, and 21-614240. Chromium was detected below the maximum soil background concentration (36.5 mg/kg) at locations 21-614225 and 21-614233. The concentrations decreased with depth to below the chromium soil maximum background concentration (36.5 mg/kg) at location 21-614229. The concentrations of chromium increased with depth at locations 21-614190, 21-614192, 21-614196, 21-614203, 21-614210, 21-614211, 21-614212, 21-614226, and 21-614236. Therefore, the vertical extent of chromium is not defined.

Cobalt was detected at six locations above the Qbt 3 BV (3.14 mg/kg) in five samples at five locations and above the soil BV (8.64 mg/kg) in one sample at location 21-614221. The maximum concentration in tuff (8.28 mg/kg) was detected at location 21-614236 from 2.5–3.5 ft bgs. The maximum concentration in soil (9.7 mg/kg) was detected at location 21-614221 from 3–4 ft bgs. The concentrations of cobalt decreased with depth at location 21-614193. The concentration in the shallower sample at location 21-614216 was below the soil BV but above the concentration in the deeper tuff sample (Appendix C, Table C-1). The concentration (9.7 mg/kg) at location 21-614221 from 3–4 ft bgs was essentially the same as the maximum soil background concentration in soil (9.5 mg/kg). The concentrations of cobalt increased with depth at locations 21-614192, 21-614236, and 21-614240. Therefore, the vertical extent of cobalt is not defined.

Copper was detected at 30 locations above the Qbt 3 BV (4.66 mg/kg) in 32 samples at 29 locations and above the soil BV (14.7 mg/kg) in 1 sample at location 21-614225. The maximum concentration in tuff

(12.6 mg/kg) was detected at location 21-614182 from 6–7 ft bgs. The maximum concentration in soil (29.7 mg/kg) was detected at location 21-614225 from 6–7 ft bgs. Copper concentrations decreased with depth at 14 locations. The copper concentrations in the shallower samples at locations 21-614210, 21-614216, 21-614233, and 21-614234 were below the soil BV but above the concentrations in the deeper tuff samples (Appendix C, Table C-1). Copper was detected below or essentially equivalent to the maximum Qbt 3 background concentration (6.2 mg/kg) at locations 21-614183, 21-614184, 21-614201, 21-614203, 21-614207, 21-614208, 21-614216, 21-614231, 21-614232, 21-614233, 21-614234, and 21-614238. The concentrations remained essentially the same with depth at locations 21-614222 and 21-614226. The concentration in the shallowest sample at location 21-614222 was below the tuff BV but similar to the concentration in the deepest tuff sample (Appendix C, Table C-1). At location 21-614226, the concentrations also remained essentially the same with depth; the concentration in the shallower sample was below the soil BV but similar to the concentration in the deeper tuff sample (Appendix C, Table C-1). The concentrations of copper increased with depth at locations 21-614192, 21-614206, 21-614211, 21-614225, 21-614228, and 21-614236. Therefore, the vertical extent of copper is not defined.

Total cyanide was detected at four locations above the Qbt 3 BV (0.5 mg/kg) in two samples at two locations and above the soil BV (0.5 mg/kg) in two samples at two locations. The maximum concentration in tuff (0.767 mg/kg) was detected at location 21-614239 from 9–10 ft bgs. The maximum concentration in soil (0.849 mg/kg) was detected at location 21-614212 from 1–2 ft bgs. The concentrations of total cyanide decreased with depth at location 21-614212. At location 21-614239, the concentrations in the shallowest and deepest depths were nondetects and increased with depth at locations 21-614216 and 21-614225. Therefore, the vertical extent of total cyanide is not defined.

Iron was detected above the Qbt 3 BV (14,500 mg/kg) in one sample at location 21-614192 from 8–9 ft bgs. This concentration was below the maximum Qbt 3 background concentration (19,500 mg/kg). Therefore, the vertical extent of iron is defined.

Lead was detected at 12 locations above the Qbt 3 BV (11.2 mg/kg) in 11 samples at 10 locations and above the soil BV (22.3 mg/kg) in 2 samples at 2 locations. The maximum concentration in tuff, 2270 mg/kg, exceeded the construction worker, industrial, and residential SSLs at location 21-614232 from 3–4 ft bgs. The maximum concentration of lead in soil (31.8 mg/kg) was detected at location 21-614225 from 6–7 ft bgs and concentrations decreased with depth at three locations. Lead was detected at or below the maximum Qbt 3 background concentration (15.5 mg/kg) at locations 21-614190, 21-614199, 21-614216, and 21-614236. The lead concentration was below the maximum soil background concentration (28 mg/kg) at location 21-614227. The concentrations remained essentially the same with depth at locations 21-614216 and 21-614236; the concentrations in the shallower samples were below the soil BV but similar to the concentrations in the deeper tuff samples (Appendix C, Table C-1). The concentrations of lead increased with depth at locations 21-614192, 21-614222, 21-614225, 21-614226, 21-614232, and 21-614234. Therefore, the vertical extent of lead is not defined.

Magnesium was detected above the Qbt 3 BV (1690 mg/kg) in five samples at five locations. The maximum concentration in Qbt 3 (3030 mg/kg) was detected at location 21-614192 from 8–9 ft bgs. Magnesium concentrations decreased with depth at location 21-614203. The concentration of magnesium in the shallower sample at location 21-614219 was below the soil BV but above the concentration in the deeper tuff sample (Appendix C, Table C-1). The concentrations remained essentially the same with depth at locations 21-614216 and 21-614236 and in the shallower samples were below the soil BV but similar to the concentrations in the deeper tuff samples (Appendix C, Table C-1). Magnesium concentrations were below the maximum Qbt 3 background concentration (2820 mg/kg) at locations

21-614203, 21-614216, 21-614219, and 21-614236. The concentrations increased with depth at location 21-614192. Therefore, the vertical extent of magnesium is not defined at location 21-614192.

Manganese was detected above the Qbt 3 BV (482 mg/kg) in four samples at four locations. The detected concentrations were below the maximum Qbt 3 background concentration (752 mg/kg) and were above the construction worker SSL. Therefore, the vertical extent of manganese is defined.

Mercury was detected at 16 locations above the Qbt 3 BV (0.1 mg/kg) in 8 samples at 7 locations and above the soil BV (0.1 mg/kg) in 11 samples at 11 locations. The maximum concentration detected in tuff (0.362 mg/kg) was at location 21-614189 from 8–9 ft bgs. The maximum concentration detected in soil (2.85 mg/kg) was at location 21-614214 from 1–2 ft bgs. The concentrations of mercury decreased with depth at 13 locations. The concentrations remained essentially the same with depth at location 21-614206, and were equivalent to the BV. The concentrations increased with depth at locations 21-614225 and 21-614229. Therefore, the vertical extent of mercury is not defined.

Nickel was detected above the Qbt 3 BV (6.58 mg/kg) in six samples at six locations. The maximum concentration (14.2 mg/kg) was detected at location 21-614236 from 2.5–3.5 ft bgs. The concentrations of nickel decreased with depth at locations 21-614211, 21-614216, and 21-614226. The concentrations in the shallower samples at these three locations were below the soil BV but above concentrations in the deeper tuff samples (Appendix C, Table C-1). The nickel concentration (6.66 mg/kg) was below the maximum Qbt 3 background concentration (7 mg/kg) at location 21-614226. The concentrations increased with depth at locations 21-614191, 21-614192, and 21-614236. Therefore, the vertical extent of nickel is not defined.

Nitrate was detected in 86 tuff samples at 51 locations and 33 soil samples at 25 locations. Most of the detected concentrations of nitrate likely reflect naturally occurring levels. However, the concentrations at locations 21-614217, 21-614218, and 21-614221 ranged from 24.5 mg/kg to 64 mg/kg. The concentrations decreased with depth at these locations. Therefore, the vertical extent of nitrate is defined.

Perchlorate was detected in 11 tuff samples at 10 locations and 22 soil samples at 18 locations. The concentrations of perchlorate decreased with depth at 19 locations and were detected below the EQLs at locations 21-614217 and 21-614229 and increased with depth at location 21-614211. Therefore, the vertical extent of perchlorate is not defined.

Selenium was detected above the Qbt 3 BV (0.3 mg/kg) in one sample at location 21-614240 from 14–15 ft bgs. The detected concentration (0.0407 mg/kg) is only slightly above the BV. Selenium DLs (0.954 mg/kg to 1.2 mg/kg) were above the BV in 88 samples. All but one selenium result reported between the BV and the maximum DL were nondetects. Therefore, the vertical extent of selenium is defined.

Silver was not detected above the soil and Qbt 3 BVs (1 mg/kg) but had DLs (2.31 to 2.8 mg/kg) above the BVs in six tuff samples and one soil sample. Silver was not detected above BV, and all results reported between the BV and the maximum DL were nondetects. Therefore, the vertical extent of silver is defined.

Thallium was detected above the Qbt 3 BV (1.1 mg/kg) in one sample at location 21-614193 from 6–7 ft bgs. The concentrations decreased with depth at this location. Therefore, the vertical extent of thallium is defined.

Vanadium was detected above the Qbt 3 BV (17 mg/kg) in four samples at four locations. The maximum concentration (19.9 mg/kg) was detected at location 21-614192 from 8–9 ft bgs. The concentrations of vanadium decreased with depth at three locations: 21-614203, 21-614216, and 21-614236. The concentrations in the shallower samples at these three locations were below the soil BV but similar to the concentration in the deeper tuff samples (Appendix C, Table C-1). Vanadium was detected below the maximum Qbt 3 background concentration (21 mg/kg) at all four locations. Therefore, the vertical extent of vanadium is defined.

Zinc was detected at nine locations above the Qbt 3 BV (63.5 mg/kg) in three samples at three locations and the soil BV (48.8 mg/kg) in eight samples at seven locations. The maximum concentration of zinc was detected in tuff (172 mg/kg) at location 21-614193 from 6–7 ft bgs. The maximum concentration was detected in soil (146 mg/kg) at location 21-614225 from 6–7 ft bgs. The concentrations decreased with depth at five locations. The detected concentrations were below the maximum soil background concentration (75.5 mg/kg) at locations 21-614189, 21-614219, 21-614227, 21-614229, and 21-614234 and increased with depth at locations 21-614199, 21-614222, and 21-614225. Therefore, the vertical extent of zinc is not defined.

Organic Chemicals

Acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, methylnaphthalene[2-], naphthalene, phenanthrene, and/or pyrene were detected in 63 samples at 37 locations. The concentrations decreased with depth at 24 locations. Most concentrations decreased with depth and/or were below the EQL. The concentrations of one or more PAHs increased with depth at locations 21-614187, 21-614210, 21-614212, 21-614215, 21-614222, 21-614224, 21-614225, 21-614229, 21-614232, and 21-614234. Therefore, the vertical extent of PAHs is not defined.

Acetone was detected in 16 samples at 11 locations. The concentrations of acetone decreased with depth at five locations. The concentrations were detected below the EQLs at locations 21-614195, 21-614197, 21-614216, 21-614217, 21-614231, and 21-614232. Therefore, the vertical extent of acetone is defined.

Aroclor-1242, Aroclor-1254, and/or Aroclor-1260 were detected in 18 samples at 10 locations. The maximum concentrations were detected at location 21-614222. The concentrations of PCBs decreased with depth at locations 21-614204, 21-614205, 21-614206, 21-614207, 21-614220, 21-614221, and 21-614223. The concentrations of Aroclor-1254 and Aroclor-1260 were below the EQL at location 21-614224, the concentrations of Aroclor-1242 decreased with depth at location 21-614222, and the concentrations of Aroclor-1254 and Aroclor-1260 increased with depth at locations 21-614222 and 21-614225. Therefore, the vertical extent of Aroclor-1254, and Aroclor-1260 is not defined.

Bis(2-ethylhexyl)phthalate and di-n-butylphthalate were detected in one sample at location 21-614229 from 9–10 ft bgs. The detected concentrations were below the EQLs. Therefore, the vertical extent of bis(2-ethylhexyl)phthalate and di-n-butylphthalate is defined.

Dibenzofuran was detected in six samples at five locations. The concentrations decreased with depth at four locations. The concentration was detected below the EQL at location 21-614225. Therefore, the vertical extent of dibenzofuran is defined.

Dichlorobenzidine[3,3-] was detected in two samples at two locations. The concentration was below the EQL at location 21-614225 and decreased with depth at location 21-614201. Therefore, the vertical extent of dichlorobenzidine[3,3-] is defined.

The dioxins/furans 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-], 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-], and/or tetrachlorodibenzofuran[2,3,7,8-] were detected in 25 samples at 12 locations. The concentrations decreased with depth at six locations. The concentrations of 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-], and octachlorodibenzofuran[1,2,3,4,6,7,8,9-] decreased or remained essentially the same with depth at location 21-614206. The concentrations of one or more dioxins/furans increased with depth at locations 21-614204, 21-614207, 21-614220, 21-614222, and 21-614225. Therefore, the vertical extent of dioxins/furans is not defined.

Ethylbenzene was detected in one sample at location 21-614212 from 1–2 ft bgs. The concentrations decreased with depth at this location. Therefore, the vertical extent of ethylbenzene is defined.

Methylene chloride was detected in six samples at three locations. The concentrations decreased with depth at locations 21-614187 and 21-614208 and remained essentially the same with depth at location 21-614193. Additionally, all results were detected below the EQLs. Therefore, the vertical extent of methylene chloride is defined.

Pentachlorophenol was detected in two samples at location 21-614190 and decreased with depth at this location. Therefore, the vertical extent of pentachlorophenol is defined.

TPH-DRO was detected in five samples at three locations. The maximum concentration (326 mg/kg) was detected at location 21-614222 from 5–6 ft bgs. The concentrations decreased with depth at locations 21-614180 and 21-614181 and increased with depth at location 21-614222. Therefore, the vertical extent of TPH-DRO is not defined.

Trimethylbenzene[1,2,4-] was detected in one sample at location 21-614208 from 6–7 ft bgs. The concentrations decreased with depth at this location. Therefore, the vertical extent of trimethylbenzene[1,2,4-] is defined.

Xylene[1,2-] was detected in two samples at two locations. The concentrations decreased with depth at both locations. Therefore, the vertical extent of xylene[1,2-] is defined.

Xylene[1,3-]+xylene[1,4-] was detected in two samples at two locations. The concentrations decreased with depth at both locations. Therefore, the vertical extent of xylene[1,3-]+xylene[1,4-] is defined.

Radionuclides

Americium-241 was detected in one sample at location 21-614225 from 6–7 ft bgs. Americium-241 activities increased with depth at this location. Therefore, the vertical extent of americium-241 is not defined.

Cesium-137 was detected in one sample at location 21-614225 from 6–7 ft bgs. Cesium-137 activities increased with depth at this location. Therefore, the vertical extent cesium-137 is not defined.

Plutonium-238 was detected in one sample at location 21-614225 from 6–7 ft bgs. Plutonium-238 activities increased with depth at this location. Therefore, the vertical extent of plutonium-238 is not defined.

Plutonium-239/240 was detected in nine samples at eight locations. The maximum activity (0.233 pCi/g) was detected at location 21-614239 from 5–6 ft bgs. Plutonium-239/240 activities decreased with depth at six locations, and increased with depth at locations 21-614225 and 21-614229. Therefore, the vertical extent of plutonium-239/240 is not defined.

Tritium was detected in 122 samples at 58 locations. The maximum activity (50.2 pCi/g) was detected at location 21-614203 from 6–7 ft bgs. Tritium activities decreased or remained essentially the same with depth at 43 locations. Tritium activities increased with depth at locations 21-614204, 21-614209, 21-614210, 21-614211, 21-614212, 21-614214, 21-614216, 21-614218, 21-614219, 21-614220, 21-614221, 21-614225, 21-614226, and 21-614234. Therefore, the vertical extent of tritium is not defined.

Uranium-235/236 was detected above the Qbt 3 BV (0.09 pCi/g) in six samples at five locations. The maximum activity (0.129 pCi/g) was detected at location 21-614183 from 8–9 ft bgs. Uranium-235/236 activities decreased at locations 21-614186, 21-614201, and 21-614231 and increased with depth at locations 21-614183 and 21-614224. Therefore, the vertical extent of uranium-235/236 is not defined.

Summary of Nature and Extent

The vertical extent of aluminum, antimony, barium, beryllium, calcium, chromium, cobalt, copper, total cyanide, lead, magnesium, mercury, nickel, perchlorate, zinc, Aroclor-1254, Aroclor-1260, dioxins/furans, PAHs, TPH-DRO, americium-241, cesium-137, plutonium-238, plutonium-239/240, tritium, and uranium 235/236 is not defined.

7.1.4 Former Building 21-155 and Associated Former Structures Footprints

7.1.4.1 Analytical Results

Decision-level data for the footprints of former building 21-155 and associated structures consist of results from 45 soil and 57 tuff samples collected in 2011 at 50 locations. The results are shown on Plates 7 through 9 and are presented in Tables 7.1-13 through 7.1-16.

Inorganic Chemicals

A total of 102 samples (45 soil and 57 tuff) were analyzed for TAL metals, nitrate, perchlorate, and total cyanide. Table 7.1-14 presents the results of the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs. Plate 7 shows the spatial distribution of inorganic chemicals detected or detected above BVs. Because the extent of contamination is not defined for the site, inorganic COPCs have not been identified.

A total of 64 samples were analyzed for asbestos. Asbestos was not detected in any of the samples (Appendix C).

Organic Chemicals

A total of 99 (45 soil and 54 tuff) were analyzed for SVOCs and VOCs. Twenty-three of the 99 samples were analyzed for explosive compounds, dioxins/furans, and PCBs. Table 7.1-15 presents the detected organic chemicals. Plate 8 shows the spatial distribution of detected organic chemicals. Because the extent of contamination is not defined for the site, organic COPCs have not been identified.

Radionuclides

A total of 102 samples (45 soil and 57 tuff) were analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, isotopic thorium, strontium-90, technetium-99, and tritium. Table 7.1-16 presents the radionuclides detected or detected above BVs/FVs. Plate 9 shows the spatial distribution of radionuclides detected or detected above BVs/FVs. Because the extent of contamination is not defined for the site, radionuclide COPCs have not been identified.

7.1.4.2 Nature and Extent of Soil and Rock Contamination

Samples collected from the footprints of former building 21-155 and associated structures address only the vertical extent of contamination. Lateral extent beyond the building footprint is not applicable because contamination from the building drains/waste lines/laboratory areas would have traveled vertically and not laterally (gravity flow). Therefore, lateral extent is defined for former building 21-155 and associated former structures, and the discussion below addresses only the vertical extent of inorganic chemicals, organic chemicals, and radionuclides.

Inorganic Chemicals

Antimony was detected above the Qbt 3 BV (0.5 mg/kg) in two samples at two locations. The concentrations of antimony decreased with depth at location 21-613023. The antimony concentration (0.522 mg/kg) at location 21-613985 was approximately equivalent to the BV. Antimony DLs (0.544 mg/kg to 1.63 mg/kg) were above the BV in 80 samples. All but two antimony results reported between the BV and the maximum DL were nondetects. Therefore, the vertical extent of antimony is defined.

Arsenic was detected above the Qbt 3 BV (2.79 mg/kg) in one sample at location 21-613996 from 7–8 ft bgs. The concentrations of arsenic increased with depth at this location and exceeded the residential SSL at 5.33 mg/kg. Therefore, the vertical extent of arsenic is not defined.

Barium was detected above the Qbt 3 BV (46 mg/kg) in eight samples at eight locations. The maximum concentration (112 mg/kg) was detected at location 21-614022 from 4–5 ft bgs. The concentrations of barium decreased with depth at three locations. The concentrations in the shallower samples at locations 21-613990, 21-613996 and 21-613998 were below the soil BV but above the concentrations in the deeper tuff samples (Appendix C, Table C-1). Barium concentrations were below or approximately equivalent to the maximum Qbt 3 background concentration (51.6 mg/kg) at locations 21-613996, 21-613998, and 21-614005. The concentrations increased with depth at location 21-614009. Therefore, the vertical extent of barium is not defined at location 21-614009.

Cadmium was not detected above the soil BV but had DLs (0.464 mg/kg to 0.595 mg/kg) above the BV (0.4 mg/kg) in 44 samples at 29 locations. Cadmium was not detected above BV, and all results reported between the BV and the maximum DL were nondetects. Therefore, the vertical extent of cadmium is defined.

Calcium was detected at 19 locations above the Qbt 3 BV (2200 mg/kg) in 15 samples at 14 locations and above the soil BV (6120 mg/kg) in 11 samples at 9 locations. The maximum concentration in tuff (27,000 mg/kg) was detected at location 21-614022 from 4–5 ft bgs. The maximum concentration in soil (17,800 mg/kg) was detected at location 21-613991 from 1–2 ft bgs. The concentrations of calcium decreased with depth at 14 locations. The concentrations in the shallower samples at locations 21-613979 and 21-613999 were below the soil BV but above the concentrations in the deeper tuff sample (Appendix C, Table C-1). The concentration at location 21-613985 was equivalent to the maximum Qbt 3 background concentration (2230 mg/kg). Calcium concentrations were below the maximum soil background concentration (14,000 mg/kg) at locations 21-613989, 21-613992, 21-614000, and 21-614021. The concentrations increased with depth at locations 21-613983 and 21-614001. Therefore, the vertical extent of calcium is not defined.

Chromium was detected at 17 locations above the Qbt 3 BV (7.14 mg/kg) in 19 samples at 14 locations and above the soil BV (19.3 mg/kg) in 3 samples at 3 locations. The maximum concentration in tuff (44.7 mg/kg) was detected at location 21-614015 from 16–17 ft bgs. The maximum concentration in soil (26.7 mg/kg) was detected at location 21-614021 from 6–7 ft bgs. The concentrations of chromium decreased with depth at five locations. The concentrations decreased with depth at locations 21-613996, 21-613998, and 21-613999; concentrations in the shallower depths at these locations were below the soil BV but above the concentrations in the deeper tuff samples (Appendix C, Table C-1). The concentrations detected were below the maximum soil background concentration (36.5 mg/kg) at location 21-614021. Chromium concentrations were below the maximum Qbt 3 background concentration (13 mg/kg) at locations 21-613984, 21-613987, 21-613996, 21-613997, 21-613998, 21-613999, 21-614000, 21-614009, and 21-614010. Chromium concentrations were below the maximum soil background concentration (36.5 mg/kg) at locations 21-613982, 21-614007, and 21-614021. The concentrations of chromium increased with depth at locations 21-613983, 21-613985, 21-613986, and 21-614001. Therefore, the vertical extent of chromium is not defined.

Cobalt was detected above the soil BV (8.64 mg/kg) in one sample at location 21-613987 from 6–7 ft bgs. The concentrations of cobalt decreased with depth at this location. The cobalt concentration (9.02 mg/kg) was below the maximum soil background concentration (9.5 mg/kg). Therefore, the vertical extent of cobalt is defined.

Copper was detected at 24 locations above the Qbt 3 BV (4.66 mg/kg) in 26 samples at 19 locations and above the soil BV (14.7 mg/kg) in 4 samples at 4 locations. Copper also had DLs above the Qbt 3 BV in four samples at four locations. The maximum concentration in tuff (33.7 mg/kg) was detected at location 21-613983 from 8–9 ft bgs. The maximum concentration in soil (20.3 mg/kg) was detected at location 21-614007 from 5–6 ft bgs. The concentrations of copper decreased with depth at 12 locations and remained essentially the same with depth at location 21-614005. The concentrations in the shallower depths at locations 21-613987, 21-613998, 21-613999, 21-614000, 21-614003, and 21-614020 were below the soil BV but above the concentrations in the deeper tuff samples (Appendix C, Table C-1). Copper concentrations were below the maximum Qbt 3 background concentration (6.2 mg/kg) at locations 21-613978, 21-613997, 21-614011, and 21-614020. The copper concentration was below the maximum soil background concentration (16 mg/kg) at location 21-613993. The concentrations increased with depth at locations 21-613983, 21-614006, 21-614012, 21-614014, and 21-614015. Therefore, the vertical extent of copper is not defined.

Lead was detected at 13 locations above the Qbt 3 BV (11.2 mg/kg) in nine samples at 9 locations and above the soil BV (22.3 mg/kg) in five samples at 5 locations. The maximum concentration in tuff (78.5 mg/kg) was detected at location 21-613997 from 6–7 ft bgs. The maximum concentration in soil (292 mg/kg) was detected at location 21-613996 from 5–6 ft bgs. The concentrations of lead decreased with depth at five locations. The detected concentrations were below the maximum Qbt 3 background concentration (15.5 mg/kg) at locations 21-613996, 21-613999, and 21-614009 and below the maximum soil background concentration (28 mg/kg) at location 21-614021. The concentrations of lead increased with depth at locations 21-613987, 21-614005, 21-614006, 21-614007, and 21-614012. Therefore, vertical extent of lead is not defined.

Manganese was detected at five locations above the Qbt 3 BV (482 mg/kg) in four samples at four locations and above the soil BV (671 mg/kg) in one sample at location 21-613987. The maximum concentration in tuff (973 mg/kg) was detected at location 21-614000 from 8–9 ft bgs. The maximum concentration in soil (780 mg/kg) was detected at location 21-613987 from 6–7 ft bgs. The concentrations of manganese decreased with depth at location 21-613987. The concentrations were below the maximum Qbt 3 background concentration (752 mg/kg) at locations 21-613986, 21-614005, and 21-614007. The manganese concentration was below the maximum soil background concentration (1100 mg/kg) at location 21-613987. The concentrations of manganese increased with depth at location 21-614000 and were above the construction worker SSL at all five locations. Therefore, the vertical extent of manganese is not defined.

Mercury was detected above the soil BV (0.1 mg/kg) in two samples at two locations. The maximum concentration (3.62 mg/kg) was detected at location 21-614024 from 1–2 ft bgs. The concentrations of mercury decreased with depth at location 21-614024 and increased with depth at location 21-613977. Therefore, the vertical extent of mercury is not defined at location 21-613977.

Nickel was detected above the Qbt 3 BV (6.58 mg/kg) in one sample at location 21-613979 from 7–8 ft bgs and above the soil BV (15.4 mg/kg) in one sample (26.5 mg/kg) at location 21-613995 from 3–4 ft bgs. The detected concentrations at location 21-613995 were below the maximum soil background concentration (29 mg/kg). The concentrations of nickel increased with depth at location 21-613979. Therefore, the vertical extent of nickel is not defined at location 21-613979.

Nitrate was detected in 57 tuff samples at 34 locations and 43 soil samples at 29 locations. Most of the detected concentrations of nitrate likely reflect naturally occurring levels. However, the concentrations of nitrate ranged from 29.7 mg/kg to 56.2 mg/kg at locations 21-613994 and 21-614018. The concentrations decreased with depth at location 21-613994 and increased with depth at location 21-614018. Therefore, the vertical extent of nitrate is not defined at location 21-614018.

Perchlorate was detected in 7 tuff samples at 6 locations and 16 soil samples at 14 locations. The concentrations decreased with depth at 15 locations. The detected concentrations of perchlorate were below the EQL at locations 21-613980 and 21-614015. The concentrations increased with depth at location 21-613990. Therefore, the vertical extent of perchlorate is not defined at location 21-613990.

Selenium was not detected above the BV but had DLs (0.879 mg/kg to 1.14 mg/kg) above the Qbt 3 BV (0.3 mg/kg) in 57 samples at 34 locations. Selenium was not detected above the BV, and all results reported between the BV and the maximum DL were nondetects. Therefore, the vertical extent of selenium is defined.

Silver was not detected above the BVs but had DLs (2.32 mg/kg to 2.85 mg/kg) above the soil and Qbt 3 BV (1 mg/kg) in 10 tuff samples and 12 soil samples. Silver was not detected above BV, and all results reported between the BV and the maximum DL were nondetects. Therefore, the vertical extent of silver is defined.

Sodium was detected above the soil BV (915 mg/kg) in one sample at location 21-613994 from 3–4 ft bgs. This concentration was below the maximum soil background concentration (1800 mg/kg). Therefore, the vertical extent of sodium is defined.

Thallium was detected above the soil BV (0.73 mg/kg) in one sample at location 21-613995 from 3–4 ft bgs. The concentrations increased with depth at this location. Therefore, the vertical extent of thallium is not defined at location 21-613995.

Zinc was detected above the soil BV (48.8 mg/kg) in five samples at five locations. The maximum concentration (136 mg/kg) was detected at location 21-613992 from 1–2 ft bgs. The concentrations decreased with depth at all locations. Zinc concentrations were below the maximum soil background concentration (75.5 mg/kg) at locations 21-613980, 21-613986, 21-613987, and 21-613988. Therefore, the vertical extent of zinc is defined.

Organic Chemicals

Acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, methylnaphthalene[2-], phenanthrene, and/or pyrene were detected in 31 samples at 21 locations. The concentrations decreased with depth at 18 locations. The detected concentrations of one or more PAHs either decreased with depth or were below EQLs at locations 21-613979, 21-613982, and 21-614003. Therefore, the vertical extent of PAHs is defined.

Acetone was detected in 11 samples at six locations. The concentrations decreased with depth at location 21-613997. The concentrations were below the EQL at locations 21-613995, 21-613017, and 21-614018 and increased with depth at locations 21-614010 and 21-614016. Therefore, the vertical extent of acetone is not defined.

Aroclor-1248, Aroclor-1254, and/or Aroclor-1260 were detected in 14 samples at seven locations. The maximum detected concentrations of Aroclor-1248 and Aroclor-1254 (0.0614 mg/kg and 0.0933 mg/kg, respectively) were at location 21-614000 from 6–7 ft bgs. The maximum detected concentration of Aroclor-1260 (0.0243 mg/kg) was at location 21-613998 from 8–9 ft bgs. The concentrations of Aroclor-1248 decreased with depth at all locations. The concentrations of Aroclor-1254 decreased with depth at locations 21-613996, 21-613997, 21-613999, 21-614000, and 21-614001. The concentrations of Aroclor-1254 increased with depth at location 21-613998. The concentrations of Aroclor-1260 decreased with depth at location 21-614001. The detected concentrations of Aroclor-1260 were below the EQL at location 21-614015. The concentrations of Aroclor-1260 increased with depth at locations 21-613997 and 21-613998. Therefore, the vertical extent of Aroclor-1248 is defined, but the vertical extent of Aroclor-1254 and Aroclor-1260 is not defined.

Bis(2-ethylhexyl)phthalate was detected in four samples at three locations. The concentrations decreased with depth at location 21-614007. The concentrations were below the EQL at 21-614024 and 21-614025. Therefore, the vertical extent of bis(2-ethylhexyl)phthalate is defined.

Butanone[2-] was detected in one sample at location 21-614016 from 3–4 ft bgs. The concentrations increased with depth at this location. Therefore, the vertical extent of butanone[2-] is not defined at location 21-614016.

Diethylphthalate was detected in three samples at three locations. The concentrations decreased with depth at location 21-613997 and were below the EQL at locations 21-614013 and 21-614022. Therefore, the vertical extent of diethylphthalate is defined.

The dioxins/furans 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-], 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-], and/or tetrachlorodibenzofuran[2,3,7,8-] were detected in 23 samples at 11 locations. The concentrations decreased or remained essentially the same with depth at five locations. The concentrations were detected below the EQLs at locations 21-614012 and 21-614015, and the concentrations of one or more dioxins/furans increased with depth at locations 21-614000, 21-614001, 21-614013, and 21-614014. Therefore, the vertical extent of dioxins/furans is not defined.

Methyl-2-pentanone[4-] was detected in three samples at three locations. The concentrations decreased with depth at locations 21-613981 and 21-614007. The concentrations detected were below the EQL at location 21-613980. Therefore, the vertical extent of methyl-2-pentanone[4-] is defined.

Methylene chloride was detected in four samples at four locations. The detected concentrations were below the EQL at all four locations. Therefore, the vertical extent of methylene chloride is defined.

Nitrotoluene[2-] was detected in one sample at location 21-613996 from 5–6 ft bgs. The concentrations decreased with depth at this location. Therefore, the vertical extent of nitrotoluene[2-] is defined.

Toluene was detected in four samples at three locations. The concentrations decreased with depth at location 21-614007 and were below the EQL at locations 21-613980 and 21-614002. Therefore, the vertical extent of toluene is defined.

Xylene[1,3-]+xylene[1,4-] was detected in three samples at three locations. The concentrations of xylene[1,3-]+xylene[1,4-] decreased with depth at locations 21-613986 and 21-614007. Xylene[1,3-]+xylene[1,4-] was detected below the EQL at location 21-614002. Therefore, the vertical extent of xylene[1,3-]+xylene[1,4-] is defined.

Radionuclides

Cesium-137 was detected (0.11 pCi/g) in one sample at location 21-614018 from 1–2 ft bgs. Activities decreased with depth at this location. Therefore, the vertical extent of cesium-137 is defined.

Plutonium-238 was detected in three samples at three locations. The maximum activity of plutonium-238 (0.045 pCi/g) was detected at location 21-613981 from 6–7 ft bgs. Activities decreased with depth at these three locations. Therefore, the vertical extent of plutonium-238 is defined.

Plutonium-239/240 was detected in 20 samples at 18 locations. The maximum activity of plutonium-239/240 (3.22 pCi/g) was detected at location 21-614015 from 12–13 ft bgs. Activities decreased with depth at 13 locations. Plutonium-239/240 activities increased with depth at locations 21-613982, 21-613999, 21-614002, 21-614003, and 21-614019. Therefore, the vertical extent of plutonium-239/240 is not defined.

Tritium was detected in 102 samples at 50 locations. The maximum activity of tritium (149.6 pCi/g) was detected at location 21-613986 from 6–7 ft bgs. Activities decreased with depth at 23 locations and remained essentially the same with depth at locations 21-613995, 21-614009, 21-614015, and 21-614016. Tritium activities increased with depth at locations 21-613977, 21-613980, 21-613982, 21-613988, 21-613989, 21-613990, 21-613991, 21-613992, 21-613993, 21-613994, 21-613997, 21-613998, 21-613999, 21-614001, 21-614003, 21-614017, 21-614018, 21-614019, 21-614020, 21-614021, 21-614022, 21-614023, and 21-614024. Therefore, the vertical extent of tritium is not defined.

Uranium-234 was detected at nine locations above the Qbt 3 BV (1.98 pCi/g) in 13 samples and above the soil BV (2.59 pCi/g) in 2 samples. The maximum activity in tuff (12.6 pCi/g) was detected at location 21-614008 from 7–8 ft bgs. The maximum activity in soil (21.7 pCi/g) was detected at location 21-613981 from 6–7 ft bgs. Activities decreased with depth at four locations and increased with depth at locations 21-614004, 21-614007, 21-614008, 21-614010, and 21-614012. Therefore, the vertical extent of uranium-234 is not defined.

Uranium-235/236 was detected at 11 locations above the Qbt 3 BV (0.09 pCi/g) in 16 samples and above the soil BV (0.2 pCi/g) in 2 samples. The maximum activity in tuff (0.638 pCi/g) was detected at location 21-614008 from 7–8 ft bgs. The maximum activity in soil (0.994 pCi/g) was detected at location 21-613981 from 6–7 ft bgs. Activities decreased with depth at four locations and increased with depth at locations 21-614004, 21-614005, 21-614006, 21-614007, 21-614008, 21-614010, and 21-614012. Therefore, the vertical extent of uranium-235/236 is not defined.

Summary of Nature and Extent

The vertical extent of arsenic, barium, calcium, chromium, copper, lead, manganese, mercury, nickel, nitrate, perchlorate, thallium, acetone, Aroclor-1254, Aroclor-1260, butanone[2-], dioxins/furans, plutonium-239/240, tritium, uranium-234, and uranium-235/236 is not defined.

7.1.5 Former Building 21-209 and Associated Former Structure 21-466 Footprints

7.1.5.1 Analytical Results

Decision-level data for the footprints of former building 21-209 and associated structure 21-466 consist of results from 18 soil and 27 tuff samples collected in 2010 and 2011 at 21 locations. The results are shown in Figures 7.1-4 and 7.1-5 and on Plate 10 and are presented in Tables 7.1-17 through 7.1-20.

Inorganic Chemicals

Forty-two samples (18 soil and 24 tuff) were analyzed for TAL metals, nitrate, perchlorate, and total cyanide. Three additional samples were analyzed for chromium only. Table 7.1-18 presents the results of the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs. Figure 7.1-4 shows the spatial distribution of inorganic chemicals detected or detected above BVs. Because the extent of contamination is not defined for the site, inorganic COPCs have not been identified.

A total of 40 samples were analyzed for asbestos. Asbestos was not detected in any of the samples (Appendix C).

Organic Chemicals

A total of 40 (18 soil and 22 tuff) were analyzed for SVOCs and VOCs. Ten of the 40 samples were analyzed for explosive compounds and dioxins/furans. Eleven samples were analyzed for PCBs. Table 7.1-19 presents the detected organic chemicals. Plate 10 shows the spatial distribution of detected organic chemicals. Because the extent of contamination is not defined for the site, organic COPCs have not been identified.

Radionuclides

A total of 42 samples (18 soil and 24 tuff) were analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, isotopic thorium, strontium-90, and tritium. A total of 25 samples (9 soil and 16 tuff) were analyzed for technetium-99. Table 7.1-20 presents the radionuclides detected or detected above BVs/FVs. Figure 7.1-5 shows the spatial distribution of radionuclides detected or detected above BVs/FVs. Because the extent of contamination is not defined for the site, radionuclide COPCs have not been identified.

7.1.5.2 Nature and Extent of Soil and Rock Contamination

Samples collected from the footprints of building 21-209 and associated structure address only vertical extent of contamination. Lateral extent beyond the building and structure footprints is not applicable because contamination from the building drains/waste lines/laboratory areas would have traveled vertically and not laterally (gravity flow). Therefore, lateral extent is defined for former building 21-209 and associated former structure 21-466, and the discussion below addresses only the vertical extent of inorganic chemicals, organic chemicals, and radionuclides.

Inorganic Chemicals

Aluminum was detected above the Qbt 3 BV (7340 mg/kg) in one sample at location 21-614369 from 3–4 ft bgs. The aluminum concentration in the shallower sample was below the soil BV but above the concentration in the deeper tuff sample (Appendix C, Table C-1). Therefore, the vertical extent of aluminum is defined.

Antimony was not detected above the BVs but had DLs (0.501 mg/kg to 1.39 mg/kg for tuff and 0.942 to 1.91 mg/kg for soil) above the tuff and soil BVs (0.5 mg/kg and 0.83 mg/kg, respectively) in 40 samples at 21 locations. Antimony was not detected above BV, and all results reported between the BV and the maximum DL were nondetects. Therefore, the vertical extent of antimony is defined.

Arsenic was detected above the Qbt 3 BV (2.79 mg/kg) in one sample at location 21-614361 from 3–4 ft bgs. This concentration was below the maximum Qbt 3 background concentration (5 mg/kg). Therefore, the vertical extent of arsenic is defined.

Barium was detected above the Qbt 3 BV (46 mg/kg) in eight samples at eight locations. The maximum concentration in tuff (190 mg/kg) was detected at location 21-614368 from 3–4 ft bgs. The concentrations of barium decreased with depth at locations 21-614364 and 21-614371. The concentrations in the shallower samples at locations 21-614361, 21-614362, 21-614366, and 21-614369 were below the soil BV but above the concentrations in the deeper tuff samples (Appendix C, Table C-1). The barium concentration was below the maximum Qbt 3 background concentration (51.6 mg/kg) at location 21-614364. Barium concentrations increased with depth at locations 21-612265 and 21-614368. Therefore, the vertical extent of barium is not defined.

Cadmium was not detected above the BV but had DLs (0.485 mg/kg to 0.56 mg/kg) above the soil BV (0.4 mg/kg) in 15 samples at 14 locations. Cadmium was not detected above BV, and all results reported between the BV and the maximum DL were nondetects. Therefore, the vertical extent of cadmium is defined.

Calcium was detected at 10 locations above the Qbt 3 BV (2200 mg/kg) in nine samples at 9 locations and above the soil BV (6120 mg/kg) in two samples at 2 locations. The maximum concentration in tuff (25,700 mg/kg) was detected at location 21-614361 from 3–4 ft bgs. The maximum concentration in soil

(8900 mg/kg) was detected at location 21-613173 from 10–11 ft bgs. The concentrations of calcium decreased with depth at location 21-614372. The concentrations in the shallower samples at locations 21-614362 and 21-614369 were below the soil BV but above the concentrations in the deeper tuff samples (Appendix C, Table C-1). The calcium concentration was equivalent to the maximum Qbt 3 background concentration (2230 mg/kg) at location 21-614362. Calcium was detected below the maximum soil background concentration (14,000 mg/kg) at location 21-612268. Calcium concentrations increased with depth at locations 21-612265, 21-612266, 21-613173, 21-614361, 21-614366, and 21-614368. Therefore, the vertical extent of calcium is not defined.

Chromium was detected above the Qbt 3 BV (7.14 mg/kg) in six samples at five locations. The maximum concentration (25.5 mg/kg) was detected at location 21-614374 from 11–12 ft bgs. The chromium concentrations at 21-613173 and 21-613174 were below the soil BV but above the concentrations in the deeper tuff samples (Appendix C, Table C-1). The concentrations decreased with depth at location 21-613175; chromium was not detected above BV in the bottom depth (12.3–13 ft bgs). The detected concentration at location 21-614361 was below the maximum Qbt 3 background concentration (13 mg/kg). Chromium concentrations increased with depth at location 21-614372. Therefore, the vertical extent of chromium is not defined at location 21-614372.

Cobalt was detected at 10 locations above the Qbt 3 BV (3.14 mg/kg) in nine samples at 9 locations and above the soil BV (8.64 mg/kg) in nine samples at 9 locations. Nine locations (21-612262, 21-612263, 21-612264, 21-612265, 21-612266, 21-612268, 21-613173, 21-613174, and 21-613175) were under the former basement drains. The range of cobalt concentrations at these nine locations was 0.297 (outside the basement area at location 21-614367) to 83.1 mg/kg (in the basement area at location 21-612268). The detected concentrations of cobalt exceed the construction worker and/or residential SSLs under the basement at locations 21-612263, 21-612264, 21-612266, 21-612268, 21-613173, and 21-613174. The concentrations of cobalt decreased with depth at seven locations. Because refusal occurred at location 21-612268 at 11 ft bgs, only one sample was collected. The concentrations of cobalt increased with depth at locations 21-612265 and 21-614366. Therefore, the vertical extent of cobalt is not defined.

Copper was detected at eight locations above the Qbt 3 BV (4.66 mg/kg) in eight samples at seven locations and above the soil BV (14.7 mg/kg) in two samples at two locations. The maximum concentration in tuff (9.48 mg/kg) was detected at location 21-614361 from 3–4 ft bgs. The maximum concentration in soil (28.5 mg/kg) was detected at location 21-612266 from 10–11 ft bgs. The concentrations remained essentially the same with depth at location 21-614366. The concentration of copper in the shallower sample at this location was similar to the concentration in the deeper tuff sample (Appendix C, Table C-1). The concentrations decreased with depth at three locations. The concentrations decreased with depth at locations 21-614362 and 21-614369 because the concentrations in the shallower samples were below the soil BV but above the concentrations in the deeper tuff samples (Appendix C, Table C-1). Copper concentrations were below or approximately equivalent to the maximum Qbt 3 background concentration (6.2 mg/kg) at locations 21-612266, 21-614362, 21-614364, 21-614366, and 21-614369. The concentrations increased with depth at locations 21-614361 and 21-614372. Therefore, the vertical extent of copper is not defined.

Lead was detected at four locations above the Qbt 3 BV (11.2 mg/kg) in three samples at three locations and above the soil BV (22.3 mg/kg) in two samples at two locations. The maximum concentration in tuff (16.6 mg/kg) was detected at location 21-614366 from 3–4 ft bgs. The maximum concentration in soil (38.5 mg/kg) was detected at location 21-613173 from 10–11 ft bgs. The concentrations of lead decreased with depth at locations 21-612264 and 21-613173. The detected concentrations of lead at location 21-614361 were below the maximum Qbt 3 background concentration (15.5 mg/kg). The lead concentration was below the maximum soil background concentration (28 mg/kg) at location 21-612264.

The concentrations increased at location 21-614366. Therefore, the vertical extent of lead is not defined at location 21-614366.

Magnesium was detected above the Qbt 3 BV (1690 mg/kg) in one sample at location 21-614369 from 3–4 ft bgs. The magnesium concentration was below the maximum Qbt 3 background concentration (2820 mg/kg) at this location The concentrations decreased with depth at this location because the concentration in the shallower sample was below the soil BV but above the concentration in the deeper tuff sample (Appendix C, Table C-1). Therefore, the vertical extent of magnesium is defined.

Manganese was detected above the Qbt 3 BV (482 mg/kg) in one sample at location 21-614372 from 14–15 ft bgs. The concentration was below the maximum Qbt 3 background concentration (752 mg/kg). The concentration was above the construction worker SSL. Therefore, the vertical extent of manganese is defined.

Mercury was detected above the Qbt 3 and soil BVs (0.1 mg/kg) at location 21-614361 from 3–4 ft bgs and location 21-614365 from 1–2 ft bgs. The concentrations of mercury decreased with depth at location 21-614365 and increased with depth at location 21-614361. Therefore, the vertical extent of mercury is not defined.

Nickel was detected above the Qbt 3 BV (6.58 mg/kg) in one sample at location 21-614361 from 3–4 ft bgs. The concentrations of nickel remained essentially the same with depth and were only slightly above the BV. The concentration in the shallower sample at this location was similar to the concentration in the deeper tuff sample (Appendix C, Table C-1). Therefore, the vertical extent of nickel is defined.

Nitrate was detected in 23 tuff samples at 18 locations and 18 soil samples at 17 locations. The detected concentrations of nitrate (maximum 19 mg/kg) likely reflect naturally occurring levels. Therefore, the vertical extent of nitrate is defined.

Perchlorate was detected in three tuff samples at three locations and six soil samples at six locations. The concentrations of perchlorate decreased with depth at four locations and remained essentially the same with depth at location 21-612266. Because refusal occurred at location 21-612268 at 11 ft bgs, only one sample was collected. The concentrations increased with depth at location 21-614361. Therefore, the vertical extent of perchlorate is not defined.

Selenium was detected above the Qbt 3 BV (0.3 mg/kg) in five samples at four locations. The maximum concentration detected (0.443 mg/kg) was at location 21-614364 from 3–4 ft bgs. The detected concentrations were all slightly above the BV (within 0.14 mg/kg). Selenium DLs (0.891 mg/kg to 1.13 mg/kg) were above the Qbt 3 BV in 19 samples. All but five selenium results reported between the BV and the maximum DL were nondetects. Therefore, the vertical extent of selenium is defined.

Silver was not detected above the BV but had DLs (2.48 to 2.6 mg/kg) above the Qbt 3 BV (1 mg/kg) in two samples at two locations. Silver was not detected above BV, and all results reported between the BV and the maximum DL were nondetects. Therefore, the vertical extent of silver is defined.

Zinc was detected above the Qbt 3 BV (63.5 mg/kg) in one sample at location 21-614361 from 3–4 ft bgs. The concentrations increased with depth at this location. Therefore, the vertical extent of zinc is not defined.

Organic Chemicals

Acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, methylnaphthalene[2-], naphthalene, phenanthrene, and/or pyrene were detected in 17 samples at 10 locations. The concentrations decreased with depth at four locations. The concentrations were below EQLs at location 21-61436, and the concentrations of one or more PAHs increased with depth at locations 21-614361, 21-614362, 21-614365, 21-614366, and 21-614370. Therefore, the vertical extent of PAHs is not defined.

Aroclor-1254 was detected in three samples at three locations. The concentrations decreased with depth at all locations. Therefore, the vertical extent of Aroclor-1254 is defined.

Bis(2-ethylhexyl)phthalate was detected in one sample at location 21-614361 from 3–4 ft bgs. The concentration was below the EQL. Therefore, the vertical extent of bis(2-ethylhexyl)phthalate is defined.

Butylbenzylphthalate was detected in one sample at location 21-614361 from 3–4 ft bgs. The concentrations increased with depth. Therefore, the vertical extent of butylbenzylphthalate is not defined.

Dibenzofuran was detected in six samples at five locations. The concentrations decreased with depth at locations 21-614362 and 21-614366 and were below the EQL at locations 21-614361, 21-614365, and 21-614370. Therefore, the vertical extent of dibenzofuran is defined.

Dichloroethane[1,2-] was detected in one sample at location 21-612266 from 10–11 ft bgs. The concentrations decreased with depth at this location. Therefore, the vertical extent of dichloroethane[1,2-] is defined.

Diethylphthalate was detected in four samples at three locations. Diethylphthalate was detected below the EQL at location 21-614366. The concentrations decreased with depth at location 21-614371 and remained essentially the same with depth at location 21-614367. Therefore, the vertical extent of diethylphthalate is defined.

Di-n-butylphthalate was detected in one sample at location 21-614361 from 3–4 ft bgs. The concentration was below the EQL. Therefore, the vertical extent of di-n-butylphthalate is defined.

Di-n-octylphthalate was detected in one sample at location 21-612266 from 10–11 ft bgs. The concentrations decreased with depth at this location. Therefore, the vertical extent of di-n-octylphthalate is defined.

One or more dioxins/furans (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[1,2,3,6,7,8-], hexachlorodibenzofuran[1,2,3,4,7,8-], hexachlorodibenzofuran[1,2,3,6,7,8-], hexachlorodibenzofuran[2,3,4,6,7,8-], octachlorodibenzodioxin[1,2,3,4,6,7,8,9-], octachlorodibenzofuran[1,2,3,4,6,7,8,9-], and/or pentachlorodibenzofuran[1,2,3,7,8-]) were detected in nine samples at five locations. The concentrations decreased or remained essentially the same with depth at these locations. Therefore, the vertical extent of dioxins/furans is defined.

Methylene chloride was detected in eight samples at six locations. The concentrations of methylene chloride decreased with depth at four locations. The detected concentrations were below the EQLs at all locations. Therefore, the vertical extent of methylene chloride is defined.

Trimethylbenzene[1,2,4-] was detected in one sample at location 21-614361 from 3–4 ft bgs. The concentration was below the EQL Therefore, the vertical extent of trimethylbenzene[1,2,4-] is defined.

Radionuclides

Plutonium-239/240 was detected in six samples at six locations. The maximum activity of plutonium-239/240 (0.0592 pCi/g) was detected at location 21-614361 from 3–4 ft bgs. Activities decreased with depth at four locations and increased with depth at locations 21-614361 and 21-614366. Therefore, the vertical extent of plutonium-239/240 is not defined.

Tritium was detected in 41 samples at 20 locations. The maximum activity of tritium (88.6 pCi/g) was detected at location 21-614364 from 1–2 ft bgs. Tritium activities decreased at 12 locations. Activities remained essentially the same with depth at locations 21-614363 and 21-614367. Activities increased with depth at locations 21-613173, 21-614361, 21-614362, 21-614368, 21-614369, and 21-614370. Therefore, the vertical extent of tritium is not defined.

Summary of Nature and Extent

The vertical extent of barium, calcium, chromium, cobalt, copper, lead, mercury, perchlorate, zinc, butylbenzylphthalate, PAHs, plutonium-239/240, and tritium is not defined.

7.1.6 AOC 21-028(d), Former Loading Dock

7.1.6.1 Analytical Results

Decision-level data at AOC 21-028(d) consist of results from 4 soil and 14 tuff samples collected from six locations in 2010 and 2011. The results are shown in Figures 7.1-6 through 7.1-8 and are presented in Tables 7.1-21 through 7.1-24.

Inorganic Chemicals

Eighteen samples (4 soil and 14 tuff) were analyzed for TAL metals, nitrate, perchlorate, and total cyanide. Table 7.1-22 presents the results of the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs. Figure 7.1-6 shows the spatial distribution of inorganic chemicals detected or detected above BVs. Because the extent of contamination is not defined for the site, inorganic COPCs have not been identified.

Organic Chemicals

Eighteen samples (4 soil and 14 tuff) were analyzed for SVOCs, VOCs, and PCBs. Table 7.1-23 presents the detected organic chemicals. Figure 7.1-7 shows the spatial distribution of detected organic chemicals. Because the extent of contamination is not defined for the site, organic COPCs have not been identified.

Radionuclides

Eighteen samples (4 soil and 14 tuff) were analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, isotopic thorium, strontium-90, technetium-99, and tritium. Table 7.1-24 presents the radionuclides detected or detected above BVs/FVs. Figure 7.1-8 shows the spatial distribution of radionuclides detected or detected above BVs/FVs. Because the extent of contamination is not defined for the site, radionuclide COPCs have not been identified.

7.1.6.2 Nature and Extent of Soil and Rock Contamination

Inorganic Chemicals

Antimony was detected at three locations above the Qbt 3 BV (0.5 mg/kg) in two samples at two locations and above the soil BV (0.83 mg/kg) in two samples at two locations. The concentrations of antimony decreased with depth at all locations and decreased laterally to the west. Antimony DLs (0.714 mg/kg to 1.53 mg/kg) were above the BV in 13 samples. All results reported between the BV and the maximum DL were nondetects. Therefore, the lateral and vertical extent of antimony are defined.

Barium was detected above the Qbt 3 BV (46 mg/kg) in five samples at four locations. The concentrations of barium decreased with depth at all locations and decreased laterally to the west. Therefore, the lateral and vertical extent of barium are defined.

Cadmium was not detected above the BV but had DLs (0.468 mg/kg to 0.51 mg/kg) above the soil BV (0.4 mg/kg) in three samples at three locations. Cadmium was not detected above BV, and all results reported between the BV and the maximum DL were nondetects. Therefore, the lateral and vertical extent of cadmium are defined.

Calcium was detected at four locations above the Qbt 3 BV (2200 mg/kg) in three samples at three locations and above the soil BV (6120 mg/kg) in two samples at two locations. The concentrations of calcium decreased with depth at all locations. However, calcium concentrations were highest at the southwest portion of the former dock (location 21-614376). Therefore, the lateral extent of calcium is not defined, but the vertical extent is defined.

Chromium was detected at six locations above the Qbt 3 BV (7.14 mg/kg) in 11 samples at six locations and above the soil BV (19.3 mg/kg) in 2 samples at two locations. The maximum concentration in tuff (37.8 mg/kg) was detected at location 21-614378 from 1–2 ft bgs. The maximum concentration in soil (33.5 mg/kg) was detected at location 21-614375 from 1–2 ft bgs. Chromium concentrations were below the maximum Qbt 3 background concentration (13 mg/kg) at locations 21-614373 and 21-614374. Chromium concentrations decreased with depth at three locations and increased with depth at location 21-614377 and decreased laterally to the west. Therefore, the lateral extent of chromium is defined, but the vertical extent is not defined.

Cobalt was detected slightly above the Qbt 3 BV (3.14 mg/kg) in one sample at location 21-614378 from 1–2 ft bgs. The concentrations of cobalt decreased with depth at this location and decreased laterally to the west. Therefore, the lateral and vertical extent of cobalt are defined.

Copper was detected at four locations above the Qbt 3 BV (4.66 mg/kg) in five samples at four locations and above the soil BV (14.7 mg/kg) in one sample at location 21-614376. The maximum concentration in tuff (13.9 mg/kg) was detected at location 21-614378 from 1–2 ft bgs. The maximum concentration in soil (14.8 mg/kg) was detected at location 21-614376 from 1–2 ft bgs. The concentrations of copper decreased with depth at three locations and increased with depth at location 21-614375. The concentrations were highest at the southwest portion of the former dock (location 21-614376). Therefore, the lateral and vertical extent of copper are not defined.

Lead was detected above the Qbt 3 BV (11.2 mg/kg) in one sample at location 21-614376 from 5–6 ft bgs. The concentrations of lead decreased with depth at this location and decreased laterally to the west. Therefore, the lateral and vertical extent of lead are defined.

Manganese was detected above the Qbt 3 BV (482 mg/kg) in one sample at location 21-614376 from 5–6 ft bgs. The concentrations of manganese decreased with depth at this location and decreased laterally to the west. The concentration detected was above the construction worker SSL. Therefore, lateral and vertical extent of manganese are defined.

Mercury was detected above the Qbt 3 BV (0.1 mg/kg) at location 21-614378 from 1–2 ft bgs. The concentrations of mercury decreased with depth at this location and decreased laterally to the west. Therefore, the lateral and vertical extent of mercury are defined.

Nickel was detected above the Qbt 3 BV (6.58 mg/kg) in two samples at two locations. The concentrations of nickel decreased with depth at both locations and decreased laterally to the west. Therefore, the lateral and vertical extent of nickel are defined.

Nitrate was detected in 12 tuff samples at six locations and 3 soil samples at three locations. The detected concentrations of nitrate (maximum 9 mg/kg) likely reflect naturally occurring levels. The concentrations decreased laterally to the west. Therefore, the lateral and vertical extent of nitrate are defined.

Perchlorate was detected in two tuff samples at one location and two soil samples at two locations. The concentrations of perchlorate decreased with depth at both locations and decreased laterally to the west. Therefore, the lateral and vertical extent of perchlorate are defined.

Selenium was detected above the Qbt 3 BV (0.3 mg/kg) in two samples at two locations. The concentrations decreased with depth at location 21-614375. Selenium was detected in the deepest depth at location 21-614374. The concentrations decreased laterally to the west. Selenium DLs (0.986 mg/kg to 1.1 mg/kg) were above the BV in 12 samples. Therefore, the lateral extent of selenium is defined, but the vertical extent is not defined.

Silver was not detected above the BV but had DLs (1.29 to 2.58 mg/kg) above the Qbt 3 BV (1 mg/kg) in two samples at two locations. Silver was not detected above BV, and all results reported between the BV and the maximum DL were nondetects. Therefore, the lateral and vertical extent of silver are defined.

Vanadium was detected above the Qbt 3 BV (17 mg/kg) in one sample at location 21-614378 from 1–2 ft bgs. The concentrations decreased with depth at this location and decreased laterally to the west. The vanadium concentration was below the maximum Qbt 3 background concentration (21 mg/kg) at this location. Therefore, the lateral and vertical extent of vanadium are defined.

Zinc was detected above the soil BV (48.8 mg/kg) in one sample at location 21-614376 from 1–2 ft bgs. The concentrations decreased with depth at this location. However, zinc concentrations were highest at the southwest portion of the former dock (location 21-614376). Therefore, and the lateral extent of zinc is not defined, but the vertical extent is defined.

Organic Chemicals

Acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, methylnaphthalene[2-], naphthalene, phenanthrene, and/or pyrene were detected in 17 samples at six locations. The highest concentrations detected at the site were at location 21-614376. The concentrations of all PAHs decreased with depth at all locations. Therefore, the lateral extent of PAHs is not defined west of location 21-614376, but the vertical extent is defined.

Acetone was detected in three samples at three locations. All concentrations were below the EQL. Therefore, the lateral and vertical extent of acetone are defined.

Aroclor-1242, Aroclor-1254, and/or Aroclor-1260 were detected in seven samples at five locations. The maximum concentrations of Aroclor-1242 and Aroclor-1254 were detected at location 21-614376 from 1–2 ft bgs (0.17 mg/kg and 0.18 mg/kg, respectively). The maximum concentration of Aroclor-1260 (0.0265 mg/kg) was detected at location 21-614377 from 1–2 ft bgs. Aroclor-1242 concentrations decreased with depth at locations 21-614375 and 21-614376. Aroclor-1254 concentrations decreased with depth at locations 21-614375, 21-614376, 21-614377, and 21-614378, and it was detected below the EQL at location 21-614374. The concentrations of Aroclor-1260 decreased with depth at locations 21-614375 and 21-614377. The highest concentrations detected at the site were at location 21-614376. Therefore, the lateral extent of Aroclor-1242 and Aroclor-1254 is not defined west of location 21-614376, but the vertical extent is defined.

Bis(2-ethylhexyl)phthalate was detected in one sample at location 21-614378 from 1–2 ft bgs. The concentration was below the EQL. Therefore, the lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Dibenzofuran was detected in five samples at five locations. The concentrations decreased with depth at all locations. Dibenzofuran was detected below the EQL at four of the five locations. The concentrations decreased laterally to the west to below EQLs. Therefore, the lateral and vertical extent of dibenzofuran are defined.

Diethylphthalate was detected in one sample at location 21-614374 from 5–6 ft bgs. It was detected below the EQL and the concentration decreased with depth. Therefore, the lateral and vertical extent of diethylphthalate are defined.

Ethylbenzene and xylene[1,2-] were detected in one sample at location 21-614376 from 1–2 ft bgs. The concentrations decreased with depth at this location and were below the EQL. Therefore, the lateral and vertical extent of ethylbenzene and xylene[1,2-] are defined.

Methylene chloride was detected in two samples at two locations. The concentrations decreased with depth at these locations and were below the EQL. Therefore, the lateral and vertical extent of methylene chloride are defined.

Toluene was detected in two samples at two locations. The concentrations decreased with depth at both locations and were below the EQL. Therefore, the lateral and vertical extent of toluene are defined.

Trimethylbenzene[1,2,4-] was detected in two samples at two locations. The concentrations decreased with depth at both locations and were below the EQL. Therefore, the lateral and vertical extent of trimethylbenzene[1,2,4-] are defined.

Xylene[1,3-]+xylene[1,4-] was detected in two samples at two locations. The concentrations decreased with depth at both locations and were below the EQL. Therefore, the lateral and vertical extent of xylene[1,3-]+xylene[1,4-] are defined.

Radionuclides

Tritium was detected in 15 samples at six locations. The maximum activity of tritium (61.7 pCi/g) was detected at location 21-614376 from 1–2 ft bgs. Tritium activities decreased with depth at all locations. The highest activity detected at the site was at location 21-614376. Therefore, the lateral extent of tritium is not defined west of location 21-614376, but the vertical extent is defined.

Summary of Nature and Extent

The lateral extent of calcium zinc, Aroclor-1242, Aroclor-1254, PAHs, and tritium is not defined. The vertical extent of chromium and selenium is not defined. The lateral and vertical extent of copper are not defined.

8.0 CONCLUSIONS

8.1 Nature and Extent of Contamination

The extent of contamination has not been defined for any of the sites addressed in this investigation report. Additional sampling is needed to define the extent of contamination for one or more inorganic chemicals, organic chemicals, and/or radionuclides. Extent has not been determined for the following areas.

- Consolidated Unit 21-004(b)-99—the lateral and vertical extent of barium; the lateral extent of perchlorate; and the vertical extent of chromium, nickel, acetone, Aroclor-1254, Aroclor-1260, isopropyltoluene[4-], americium-241, plutonium-239/240, and tritium.
- SWMU 21-011(b)—the vertical extent of calcium, mercury, nickel, selenium, diethylphthalate, dioxins/furans, hexanone[2-], PAHs, americium-241, plutonium-239/240, and tritium.
- Former building 21-152 and associated former structures—the vertical extent of aluminum, antimony, barium, beryllium, calcium, chromium, cobalt, copper, total cyanide, lead, magnesium, mercury, nickel, perchlorate, zinc, Aroclor-1254, Aroclor-1260, dioxins/furans, PAHs, TPH-DRO, americium-241, cesium-137, plutonium-238, plutonium-239/240, tritium, and uranium-235/236.
- Former building 21-155 and associated former structures—the vertical extent of arsenic, barium, calcium, chromium, copper, lead, manganese, mercury, nickel, nitrate, perchlorate, thallium, acetone, Aroclor-1254, Aroclor-1260, butanone[2-], dioxins/furans, plutonium-239/240, tritium, uranium-234, and uranium-235/236.
- Former building 21-209 and associated former structure 21-466—the vertical extent of barium, calcium, chromium, cobalt, copper, lead, mercury, perchlorate, zinc, butylbenzylphthalate, PAHs, plutonium-239/240, and tritium.
- AOC 21-028(d)—the lateral and vertical extent of copper; the vertical extent of chromium and selenium; the lateral extent of calcium, zinc, Aroclor-1242, Aroclor-1254, PAHs, and tritium.

Additionally, the following areas have detections above SSLs/SALs.

SWMU 21-011(b):

- Americium-241 exceeds the construction worker and residential SALs at location 21-613847.
- Plutonium-239/240 exceeds the construction worker, industrial, and residential SALs at location 21-613847.
- Tritium at exceeds the residential SAL at location 21-613826.
- Manganese exceeds the construction worker SSL at location 21-613838.

Former Building 21-152:

- Lead exceeds the construction worker, industrial, and residential SSLs at location 21-614232.
- Manganese exceeds the construction worker SSL at locations 21-614192, 21-614194, 21-614199, and 21-614236.

Former Building 21-155:

- Arsenic exceeds the residential SSL at location 21-613996.
- Manganese exceeds the construction worker SSL at locations 21-613986, 21-613987, 21-614000, 21-614005, and 21-614007.
- Thallium exceeds the residential SSL at location 21-613995.

Former Building 21-209:

- Cobalt exceeds the construction worker and/or residential SSLs at locations 21-612263, 21-612264, 21-612266, 21-612268, 21-613173, and 21-613174.
- Manganese exceeds the construction worker SSL at location 21-614372.

AOC 21-028(d):

- Manganese exceeds the construction worker SSL at location 21-614376.

8.2 Summary of Risk-Screening Assessments

8.2.1 Human Health

Human health risk assessments have not been performed because extent is not defined for any of the investigation sites.

8.2.2 Ecological

Ecological risk assessments have not been performed because extent is not defined for any of the investigation sites.

9.0 RECOMMENDATIONS

The extent of contamination has not been defined for any of the sites presented in this investigation report. Additional sampling is needed to define the extent of contamination for one or more inorganic chemicals, organic chemicals, and/or radionuclides. Cleanup of areas with contamination above SSLs/SALs may also be warranted.

A Phase II investigation work plan will be developed specifying sampling locations, numbers of samples, and analytical suites required to define the extent of contamination for those sites. Upon completion of the proposed Phase II sampling, the data will be used to define the extent of contamination and to complete human health and ecological risk-screening assessments.

Schedule for Recommended Activities

A Phase II investigation work plan will be developed and submitted to NMED after this investigation report is approved. The Phase II work plan will provide details and a schedule for implementing sampling activities and submitting a Phase II investigation report.

10.0 REFERENCES AND MAP DATA SOURCES

10.1 References

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

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

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

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

Broxton, D.E., and P.G. Eller (Eds.), June 1995. "Earth Science Investigations for Environmental Restoration—Los Alamos National Laboratory, Technical Area 21," Los Alamos National Laboratory report LA-12934-MS, Los Alamos, New Mexico. (Broxton and Eller 1995, 058207)

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

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

Christensen, E.L., and W.J. Maraman, April 1969. "Plutonium Processing at the Los Alamos Scientific Laboratory," Los Alamos Scientific Laboratory report LA-3542, Los Alamos, New Mexico. (Christensen and Maraman 1969, 004779)

Collins, K.A., A.M. Simmons, B.A. Robinson, and C.I. Nylander (Eds.), December 2005. "Los Alamos National Laboratory's Hydrogeologic Studies of the Pajarito Plateau: A Synthesis of Hydrogeologic Workplan Activities (1998–2004)," Los Alamos National Laboratory report LA-14263-MS, Los Alamos, New Mexico. (Collins et al. 2005, 092028)

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

DOE (U.S. Department of Energy), June 13, 2000. “Procedure for the Release of Residual Radioactive Material from Real Property,” U.S. Department of Energy memorandum to D. Glenn, I.R. Triay, M. Zamorski, E. Sellers, D. Gurule, and D. Bergman-Tabbert from C.L. Soden, Albuquerque, New Mexico. (DOE 2000, 067489)

Francis, W.C., March 21, 1997. “History of the General's Tanks, SWMU 21-014 and ACIS Waste Sump Pump Structure TA-21-223, SWMU 21-011(b),” Los Alamos National Laboratory memorandum to C. Newton (EES-1) from W.C. Francis (CST-18), Los Alamos, New Mexico. (Francis 1997, 076126)

Galusha, T., and J.C. Blick, April 1971. “Stratigraphy of the Santa Fe Group, New Mexico,” *Bulletin of the American Museum of Natural History,* Vol. 144, No. 1, pp. 1–128. (Galusha and Blick 1971, 021526)

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

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

Harper, J.R., and R. Garde, November 1981. “The Decommissioning of TA-21-153, A^{227}Ac-Contaminated Old Filter Building,” Los Alamos National Laboratory report LA-9047-MS, Los Alamos, New Mexico. (Harper and Garde 1981, 006281)

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

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

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

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

Koch, R.J., and S. Schmeer, March 2011. "Groundwater Level Status Report for 2010, Los Alamos National Laboratory," Los Alamos National Laboratory report LA-14437-PR, Los Alamos, New Mexico. (Koch and Schmeer 2011, 201566)

LANL (Los Alamos National Laboratory), June 22, 1984. "Building Exhaust and Space Modifications, Vacuum Pump Waste Piping Plan, Bldg. DP-152, TA-21," Engineering Drawing ENG-C-44350, sheet number M-7, 13 of 21, Los Alamos, New Mexico. (LANL 1984, 109229)

LANL (Los Alamos National Laboratory), October 4, 1988. "Building Mods, Mechanical Utility and Site Plan, Bldg. DP-155, TA-21, Revised," Engineering Drawing ENG-C43335, Los Alamos, New Mexico. (LANL 1988, 087575)

LANL (Los Alamos National Laboratory), November 1990. "Solid Waste Management Units Report," Vol. II of IV (TA-10 through TA-25), Los Alamos National Laboratory document LA-UR-90-3400, Los Alamos, New Mexico. (LANL 1990, 007512)

LANL (Los Alamos National Laboratory), May 1991. "TA-21 Operable Unit RFI Work Plan for Environmental Restoration," Vol. II (Chapters 14 to 16), Los Alamos National Laboratory document LA-UR-91-962, Los Alamos, New Mexico. (LANL 1991, 007529)

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

LANL (Los Alamos National Laboratory), June 1996. "RFI Report for Potential Release Sites 21-004(a-c), 21-028(d,e), Field Unit 1," Los Alamos National Laboratory document LA-UR-96-2041, Environmental Restoration Project, Los Alamos, New Mexico. (LANL 1996, 054828)

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

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

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

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

LANL (Los Alamos National Laboratory), November 1998. “Installation Work Plan for Environmental Restoration Program,” Rev. 7, Los Alamos National Laboratory document LA-UR-98-4652, Los Alamos, New Mexico. (LANL 1998, 062060)

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

LANL (Los Alamos National Laboratory), August 2004. “Investigation Work Plan for Delta Prime Site Aggregate Area at Technical Area 21,” Los Alamos National Laboratory document LA-UR-04-5009, Los Alamos, New Mexico. (LANL 2004, 087461)

LANL (Los Alamos National Laboratory), December 2008. “Delta Prime Site Aggregate Area Phase II Work Plan, Revision 1,” Los Alamos National Laboratory document LA-UR-08-7794, Los Alamos, New Mexico. (LANL 2008, 104989)

LANL (Los Alamos National Laboratory), December 2009. “Investigation Work Plan for Delta Prime Site Aggregate Area Delayed Sites, Revision 1,” Los Alamos National Laboratory document LA-UR-09-8180, Los Alamos, New Mexico. (LANL 2009, 108166.9)

LANL (Los Alamos National Laboratory), December 2009. “Radionuclide Screening Action Levels (SALs) from RESRAD, Version 6.5,” Los Alamos National Laboratory document LA-UR-09-8111, Los Alamos, New Mexico. (LANL 2009, 107655)

LANL (Los Alamos National Laboratory), June 2010. “2010 Interim Facility-Wide Groundwater Monitoring Plan,” Los Alamos National Laboratory document LA-UR-10-1777, Los Alamos, New Mexico. (LANL 2010, 109830)

LANL (Los Alamos National Laboratory), July 2010. “Delta Prime East Building Footprints Letter Work Plan, Revision 1,” Los Alamos National Laboratory document LA-UR-10-4812, Los Alamos, New Mexico. (LANL 2010, 110082.4)

LANL (Los Alamos National Laboratory), October 2010. “Phase II Investigation Report for Delta Prime Site Aggregate Area at Technical Area 21, Revision 1,” Los Alamos National Laboratory document LA-UR-10-6478, Los Alamos, New Mexico. (LANL 2010, 110772.33)

LANL (Los Alamos National Laboratory), March 2011. “2011 General Facility Information,” Los Alamos National Laboratory document LA-UR-11-0940, Los Alamos, New Mexico. (LANL 2011, 201568)

LANL (Los Alamos National Laboratory), August 2011. “2011 Interim Facility-Wide Groundwater Monitoring Plan,” Los Alamos National Laboratory document LA-UR-11-2183, Los Alamos, New Mexico. (LANL 2011, 205231)

LANL (Los Alamos National Laboratory), August 2011. “Los Alamos National Laboratory American Recovery and Reinvestment Act (ARRA) Project, Critical Decision 4, American Recovery and Reinvestment Act, Environmental Cleanup Project, Demolition of TA-21 Delta Prime (DP) East and West Facilities,” PBS VL-LANL-0040D.R1 Defense D&D - TA-21, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2011, 206183)

LANL (Los Alamos National Laboratory), October 2011. "Ecorisk Database (Release 3.0)," on CD, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2011, 206473)

LANL (Los Alamos National Laboratory), December 2011. "Completion Report for Regional Aquifer Well R-64," Los Alamos National Laboratory document LA-UR-11-6712, Los Alamos, New Mexico. (LANL 2011, 208721)

LASL (Los Alamos Scientific Laboratory), April 25, 1945. "Mechanical Equipment and Piping, DPE-152, DP Site Construction," Engineering Drawing ENG-C-2243, sheet number 10 of 52, Los Alamos, New Mexico. (LASL 1945, 109230)

LASL (Los Alamos Scientific Laboratory), January 30, 1964. "High Temperature Chemistry Facility, Floor Plan-First Floor, Bldg. DP-209, TA-21," Engineering Drawing ENG-PL-1134, Los Alamos, New Mexico. (LASL 1964, 109231)

LASL (Los Alamos Scientific Laboratory), January 4, 1968. "TA-21, D.P. 257, Contaminated Waste Disposal Facility, Mechanical Utilities Plot Plan, Revision 1," Engineering Drawing ENG-C-36380, sheet number 13 of 51, Los Alamos, New Mexico. (LASL 1968, 089723)

LASL (Los Alamos Scientific Laboratory), May 20, 1968. "DP-155, Furnace Facility, Building 207, TA-21, Exterior and Site Detail, Revision 3," Engineering Drawing ENG-C-27027, sheet number 5 of 36, Los Alamos, New Mexico. (LASL 1968, 089722)

LASL (Los Alamos Scientific Laboratory), February 16, 1969. "Dry Box Facility, Index and Site Location Plan, D.P.East-Bldg.-209, TA-21, Revision 1," Engineering Drawing ENG-PL-509, sheet number 1 of 9, Los Alamos, New Mexico. (LASL 1969, 109232)

LASL (Los Alamos Scientific Laboratory), 1975. "LASL Underground Lines, Contaminated and Industrial Waste, TA-21, DP-West," Engineering Drawing ENG-R-4822, sheet number D-7, Los Alamos, New Mexico. (LASL 1975, 089724)

LASL (Los Alamos Scientific Laboratory), December 19, 1977. "Building Mod's Mechanical Utility and Site Plan, Bldg. DP-155, TA-21," Engineering Drawing ENG-C-43335, sheet number 11 of 43, Los Alamos, New Mexico. (LASL 1977, 089726)

LASL (Los Alamos Scientific Laboratory), September 14, 1979. "Pumping Station Mods., Civil: Plot Plan and Profiles, Bldg. DP-346, TA-21," Engineering Drawing ENG-C-43537, sheet number 2 of 4, Los Alamos, New Mexico. (LASL 1979, 089721)

McGehee, E.D., and K.L.M. Garcia, December 23, 1999. "Historic Building Assessment for the Department of Energy Conveyance and Transfer Project," Vol. 1, Los Alamos National Laboratory document LA-UR-00-1003, Los Alamos, New Mexico. (McGehee and Garcia 1999, 087442)

NMED (New Mexico Environment Department), April 13, 2005. "Approval with Modifications for the Investigation Work Plan for Delta Prime Site Aggregate Area at Technical Area 21," New Mexico Environment Department letter to D. Gregory (DOE LASO) and G.P. Nanos (LANL Director) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2005, 089314)

NMED (New Mexico Environment Department), October 2006. "New Mexico Environment Department TPH Screening Guidelines," Santa Fe, New Mexico. (NMED 2006, 094614)

NMED (New Mexico Environment Department), December 2009. "Technical Background Document for Development of Soil Screening Levels, Revision 5.0," with revised Table A-1, New Mexico Environment Department, Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, Santa Fe, New Mexico. (NMED 2009, 108070)

NMED (New Mexico Environment Department), January 11, 2010. "Approval, Investigation Work Plan for Delta Prime Site Aggregate Area Delayed Sites at Technical Area 21," New Mexico Environment Department letter to G.J. Rael (DOE-LASO) and M.J. Graham (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2010, 108443)

NMED (New Mexico Environment Department), July 26, 2010. "Approval, Delta Prime East Building Footprints Letter Work Plan for Delta Prime Site Aggregate Area, Technical Area 21," New Mexico Environment Department letter to G.J. Rael (DOE-LASO) and M.J. Graham (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2010, 110422)

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

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

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

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

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

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

Smith, R., June 1960. "Ash Flows," *Bulletin of the Geological Society of America,* Vol. 71, pp. 795-842. (Smith 1960, 048820)

Smith, R.L., 1960. "Zones and Zonal Variations in Welded Ash Flows," Professional Paper 354-F, U.S. Geological Survey, Washington, D.C., pp. 149-159. (Smith 1960, 048819)

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

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

Spell, T.L., T.M. Harrison, and J.A. Wolff, January 18, 1990. "$^{40}Ar/^{39}Ar$ Dating of the Bandelier Tuff and San Diego Canyon Ignimbrites, Jemez Mountains, New Mexico: Temporal Constraints on Magmatic Evolution," *Journal of Volcanology and Geothermal Research,* Vol. 43, pp. 175-193. (Spell et al. 1990, 021586)

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

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

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

Turbeville, B.N., D.B. Waresback, and S. Self, February 1989. "Lava-Dome Growth and Explosive Volcanism in the Jemez Mountains, New Mexico: Evidence from the Pilo-Pliestocene Puye Alluvial Fan," *Journal of Volcanology and Geothermal Research,* Vol. 36, pp. 267-291. (Turbeville et al. 1989, 021587)

10.2 Map Data Sources

Locations: ER Project Locations; Los Alamos National Laboratory, ESH&Q Waste and Environmental Services Division, 2010-2E; 1:2,500 Scale Data; 04 October 2010.

Removed Piping: Digitized from LANL/LASL engineering drawings as published, unknown publication date.

Piping: Digitized from LANL/LASL engineering drawings as published, unknown publication date.

Former dry well: Digitized from LANL/LASL engineering drawings as published, unknown publication date.

Former floor trench: Digitized from LANL/LASL engineering drawings as published, unknown publication date.

Former generator: Digitized from LANL/LASL engineering drawings as published, unknown publication date.

Former pit: Digitized from LANL/LASL engineering drawings as published, unknown publication date.

Former Floor drain: Digitized from LANL/LASL engineering drawings as published, unknown publication date.

Former holding pit: Digitized from LANL/LASL engineering drawings as published, unknown publication date.

Former 5 ft wide round pit: Digitized from LANL/LASL engineering drawings as published, unknown publication date.

Former loading dock: Digitized from LANL/LASL engineering drawings as published, unknown publication date.

Security 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 29 November 2010.

Paved roads: Paved Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 29 November 2010.

Unpaved roads: Dirt Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 29 November 2010.

Communication line: Communication Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 08 August 2002; as published 29 November 2010.

Electric line: Primary Electric Grid; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 29 November 2010.

Gas line: Primary Gas Distribution Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 29 November 2010.

Sewer line: Sewer Line System; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 29 November 2010.

Steam line: Steam Line Distribution System; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 29 November 2010.

Water line: Water Utility Distribution System Maintained by the County of Los Alamos; County of Los Alamos, Information Services; as published 04 March 2009.

Hypsography: Hypsography, 100, 20, 10, 2 Foot Contour Interval; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.

Structures: Structures; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 29 November 2010.

Former structures: Former Structures of the Los Alamos Site; Los Alamos National Laboratory, ESH&Q Waste and Environmental Services Division, EP2010-1B; 1:2,500 Scale Data; 09 August 2010.

Road centerline: Road Centerlines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 15 December 2005; as published 29 November 2010.

Technical area: Technical Area Boundaries; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; September 2007; as published 13 August 2010.

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

MDA: Waste Storage Features; Los Alamos National Laboratory, Environment and Remediation Support Services Division, GIS/Geotechnical Services Group, EP2007-0032; 1:2,500 Scale Data; 13 April 2007.

PRS: Potential Release Sites; Los Alamos National Laboratory, ESH&Q Waste & Environmental Services Division, Environmental Data and Analysis Group, EP2010-1C; 1:2,500 Scale Data; 02 December 2010.

LANL area: LANL Areas Used and Occupied ; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; 19 September 2007; as published 13 August 2010.

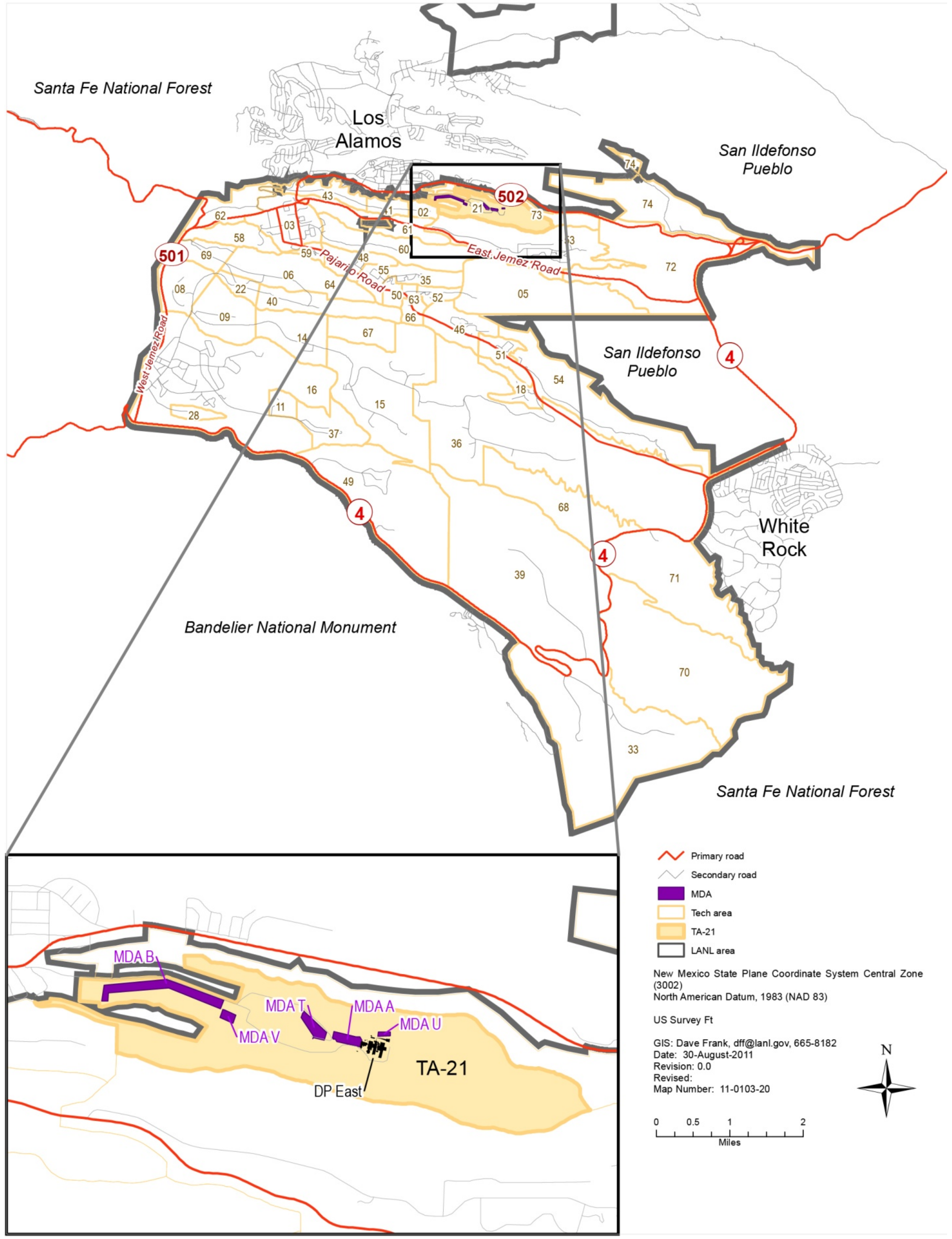

Figure 1.0-1 Location of TA-21 with respect to surrounding land holdings

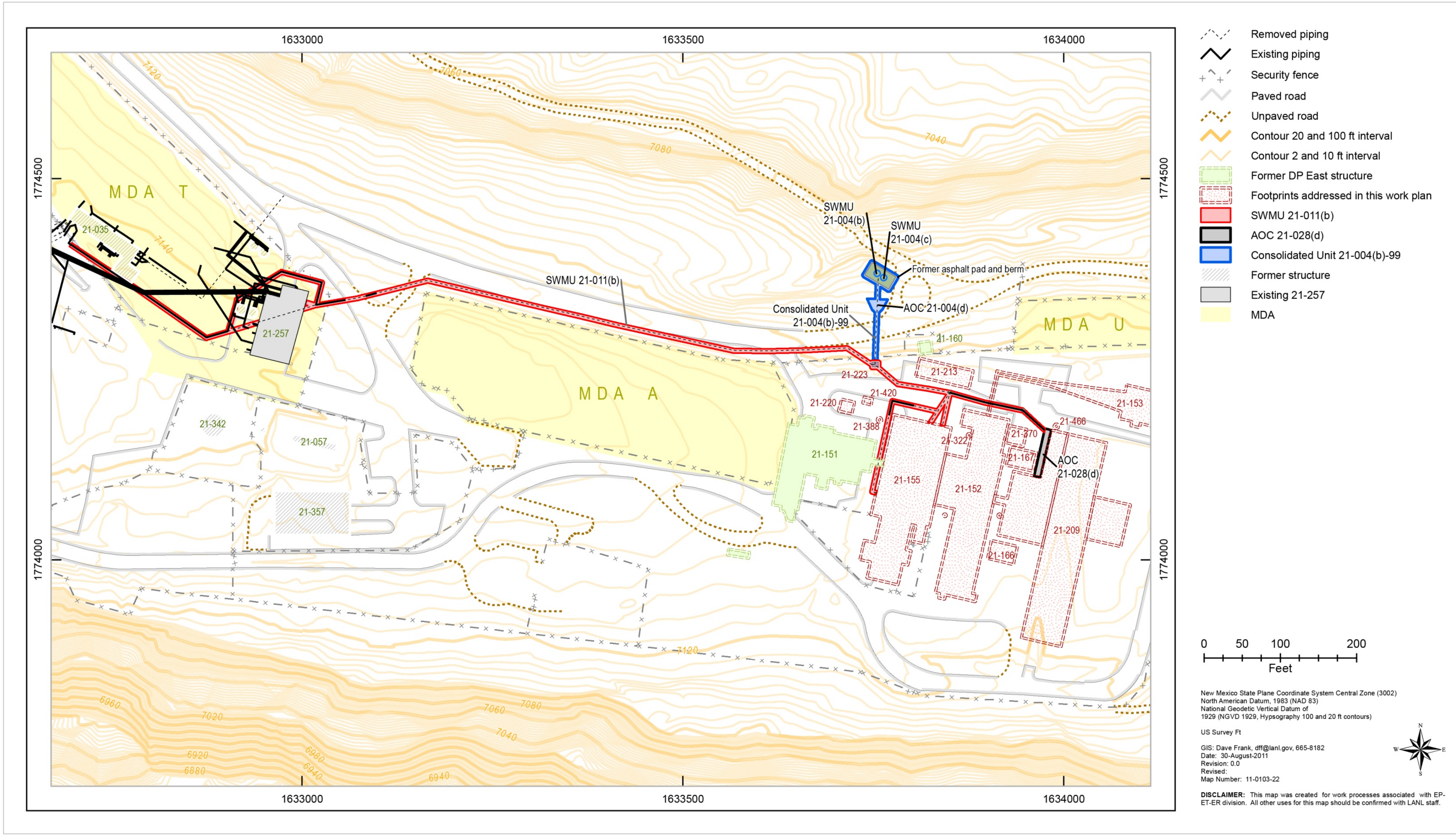

Figure 1.0-2 DP Site Aggregate Area sites addressed in this report

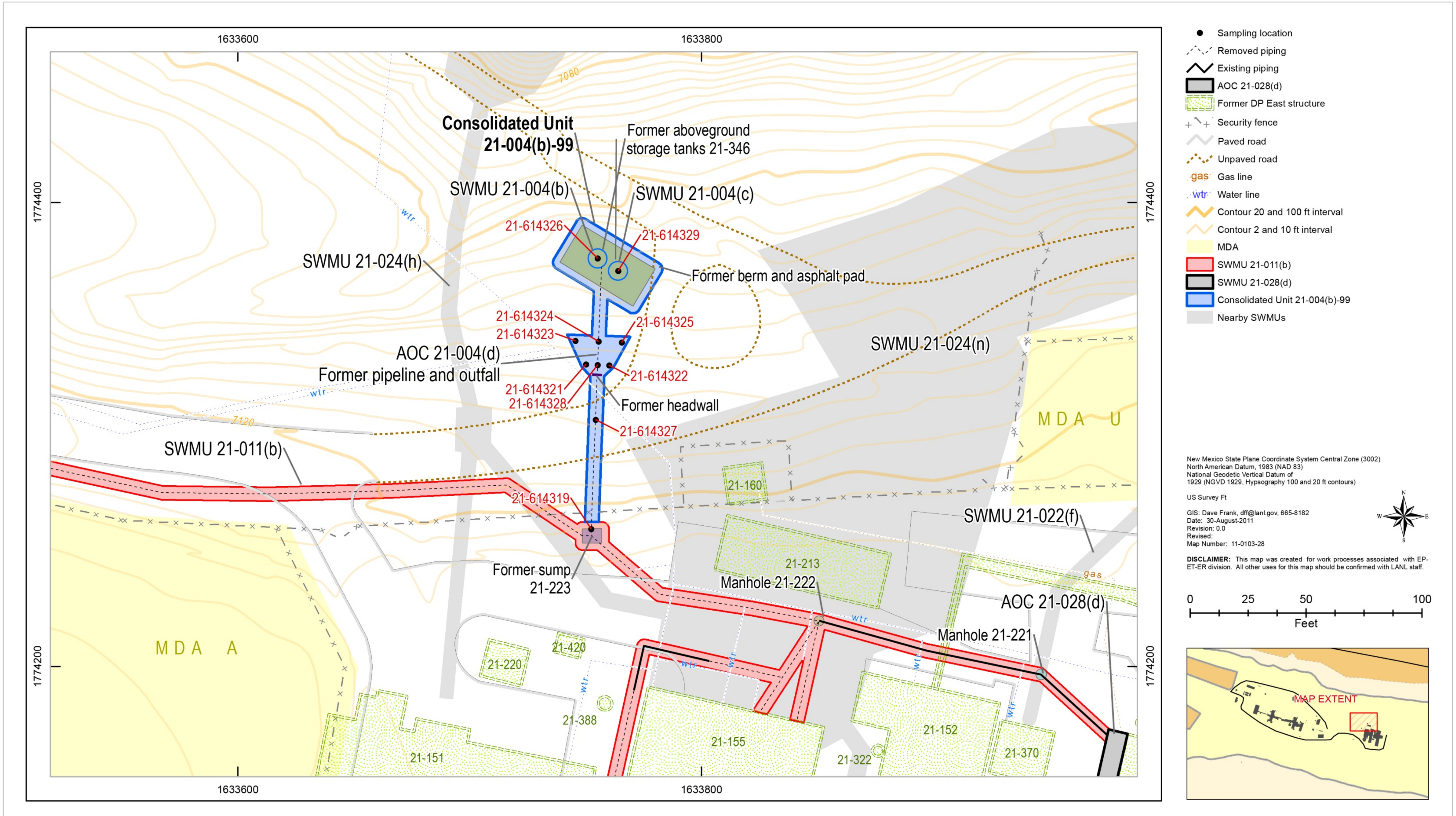

Figure 2.2-1 Consolidated Unit 21-004(b)-99 aboveground storage tanks and former outfall site map with sampling locations

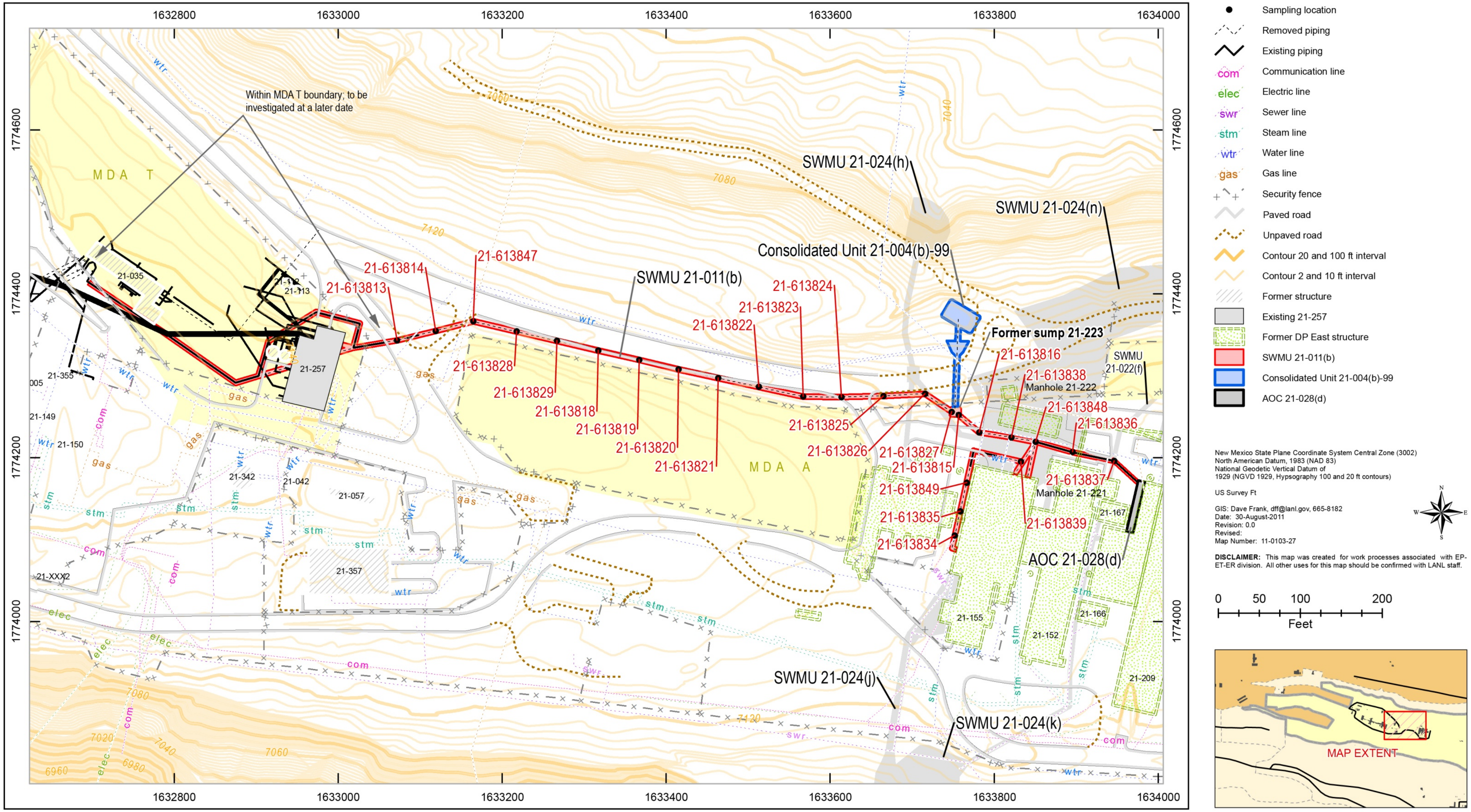

Figure 2.3-1 SWMU 21-011(b) acid waste lines and sump site map with sampling locations

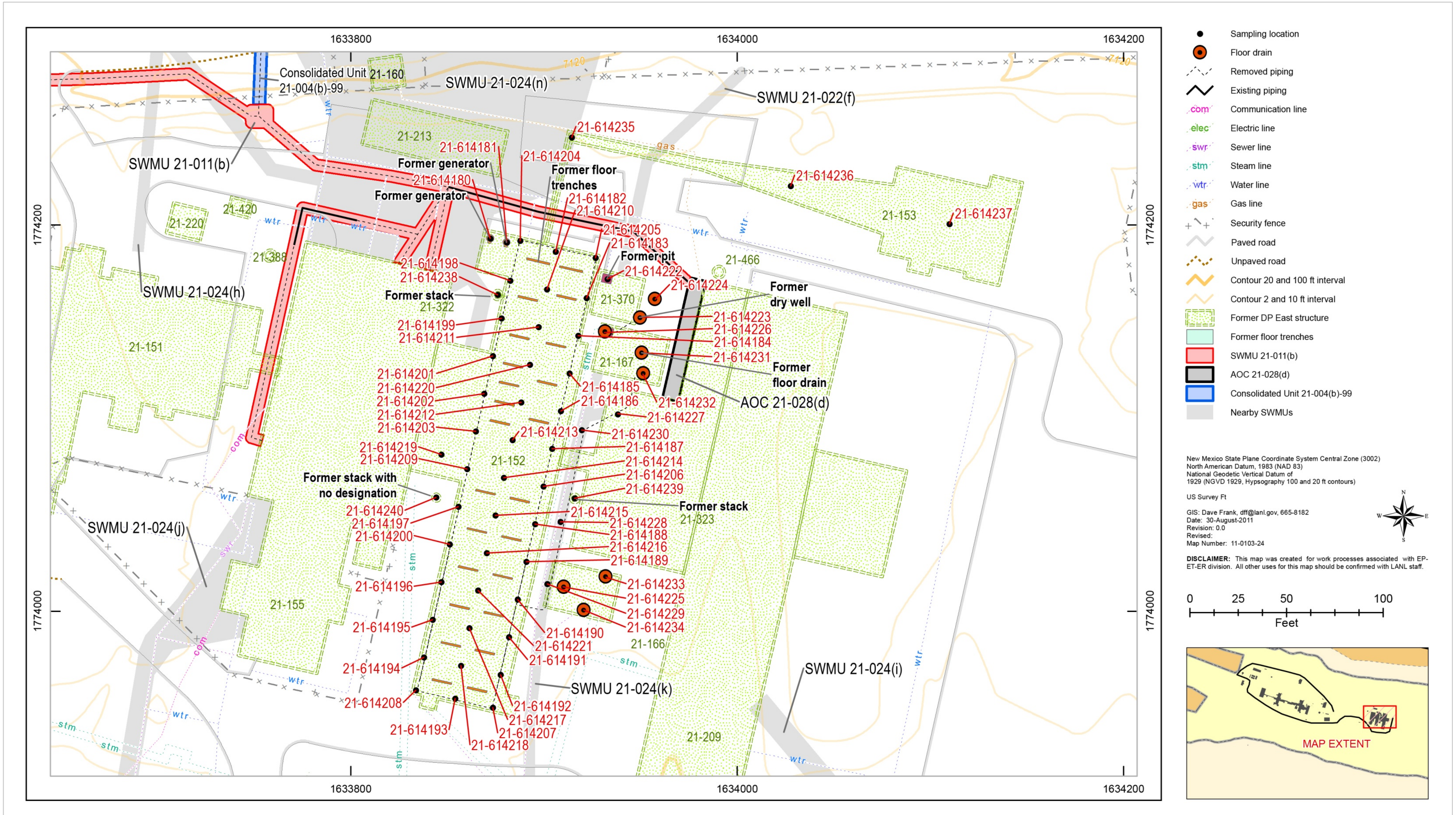

Figure 2.4-1 Former building 21-152 and associated former structures footprints site map with sampling locations

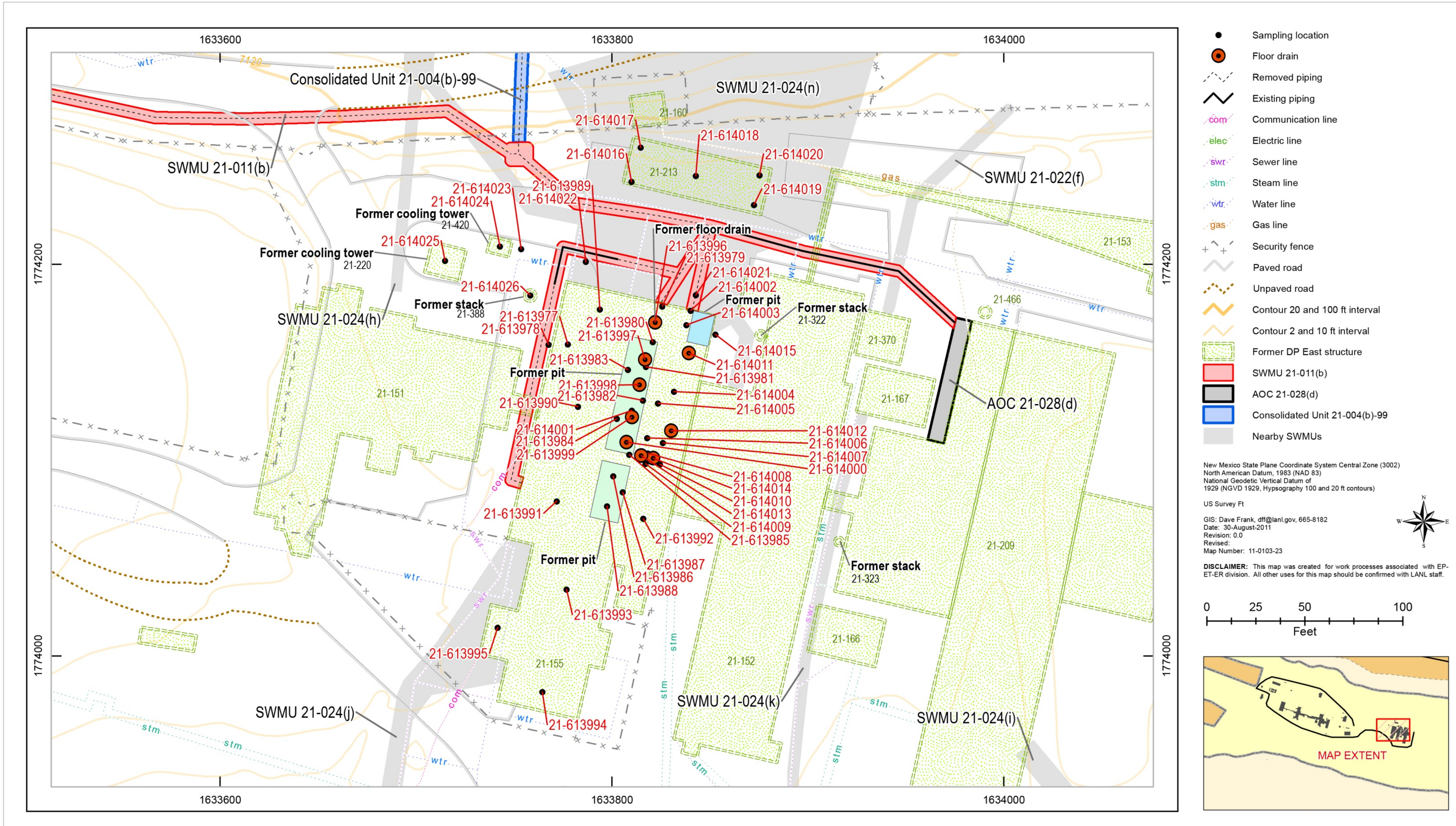

Figure 2.5-1 Former building 21-155 and associated former structures footprints site map with sampling locations

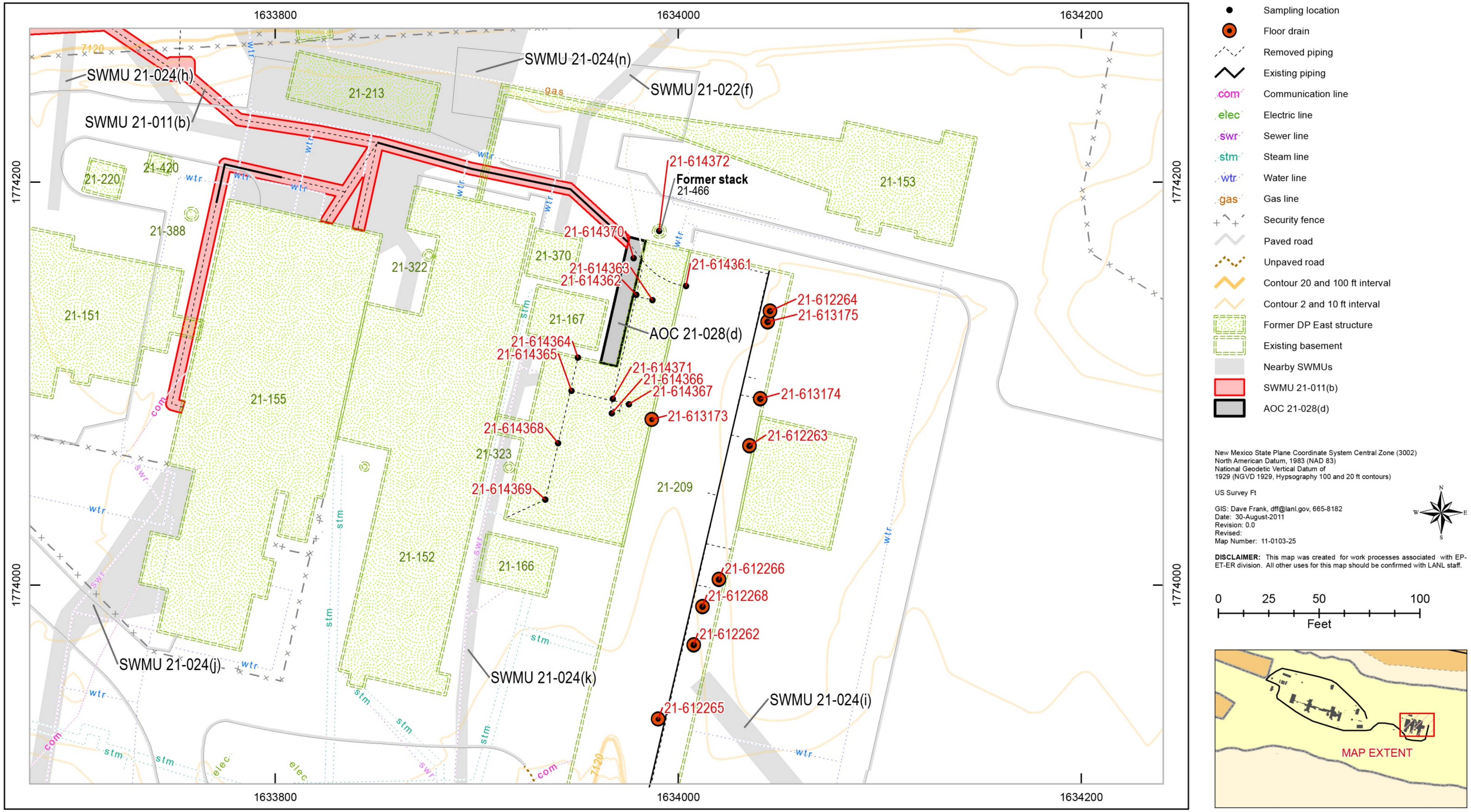

Figure 2.6-1 Former building 21-209 and associated former structure 21-466 footprints site map with sampling locations

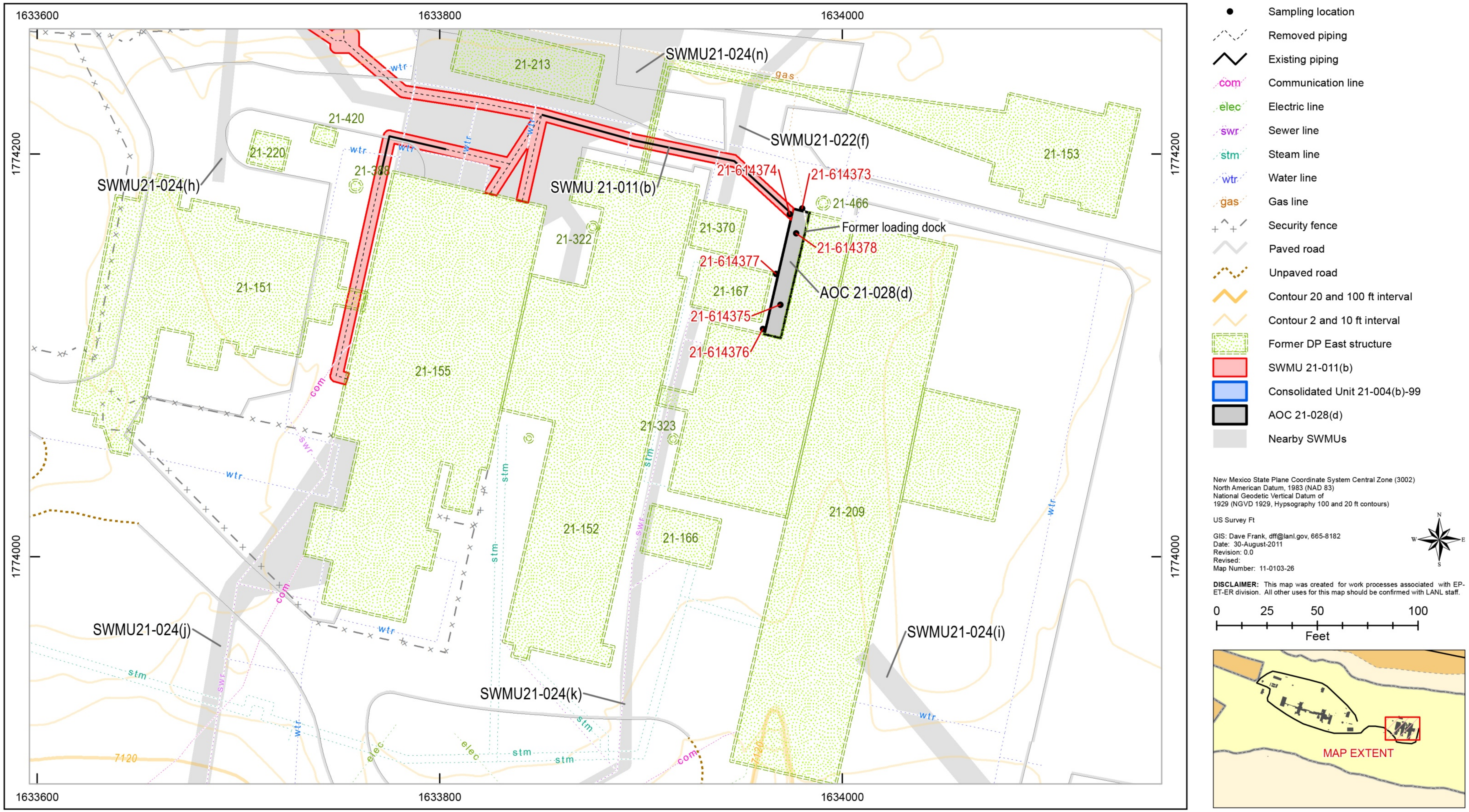

Figure 2.7-1 AOC 21-028(d) former loading dock site map with sampling locations

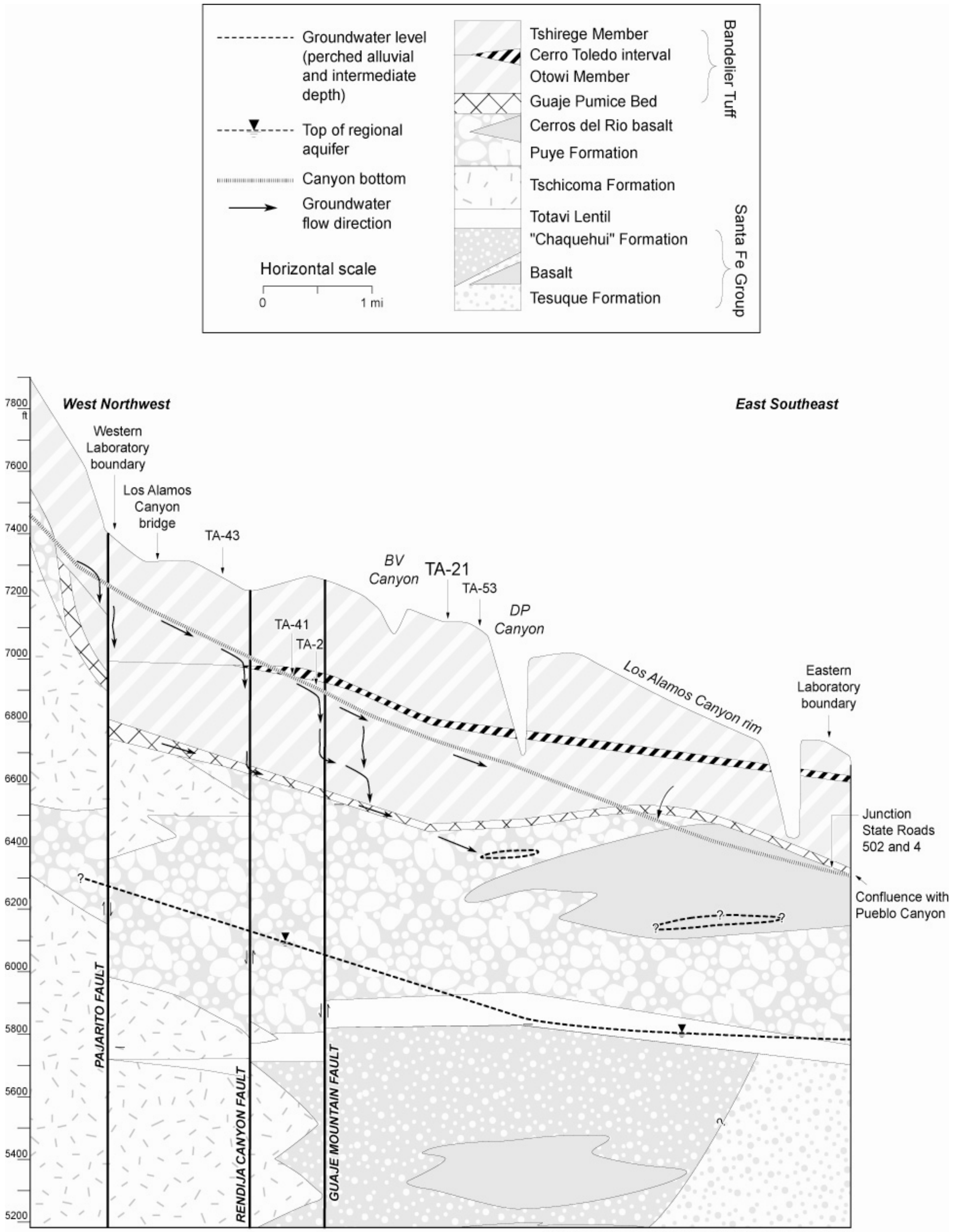

Figure 3.2-1 General stratigraphy beneath TA-21

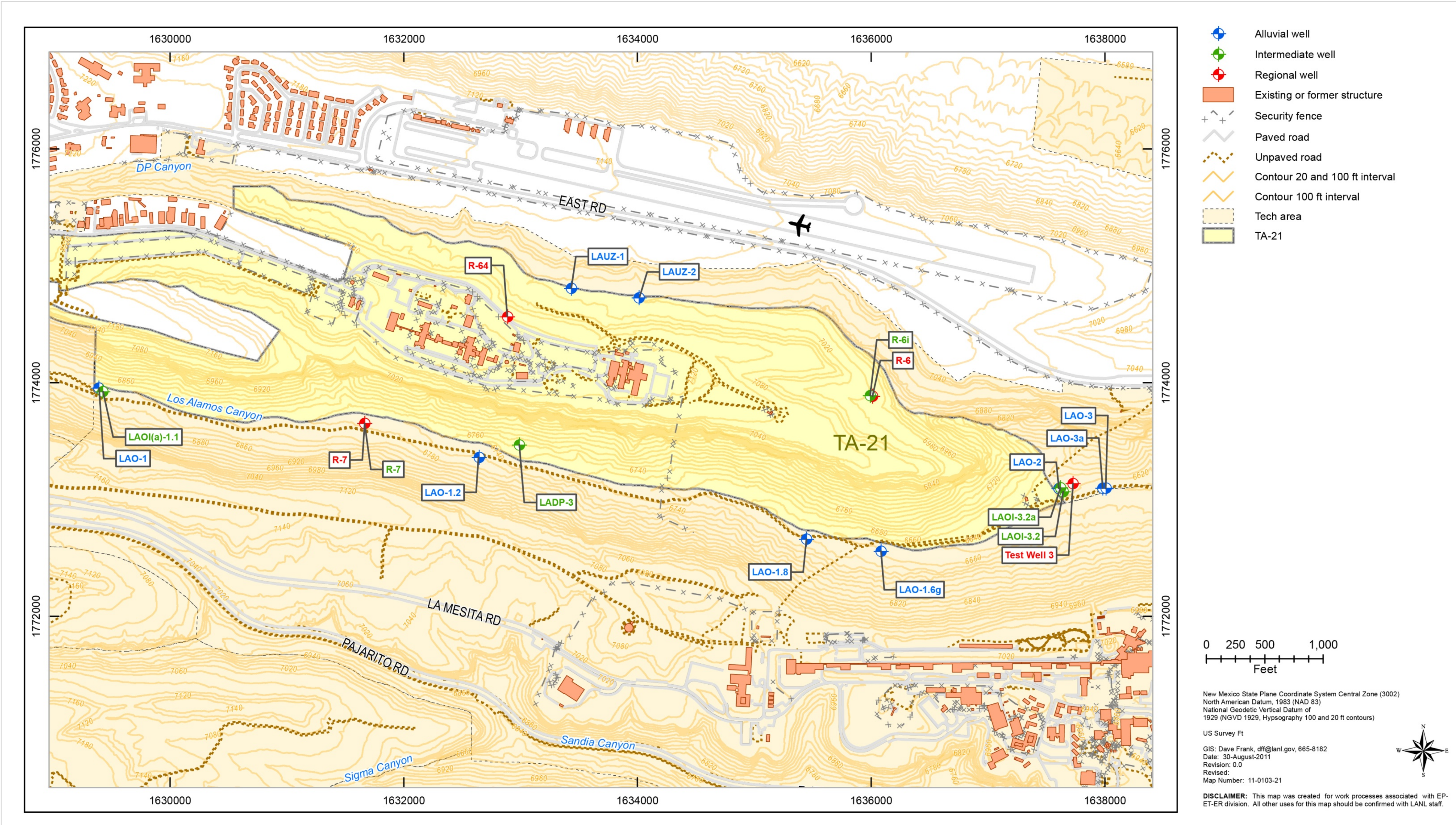

Figure 3.2-2 Groundwater monitoring wells in the vicinity of TA-21

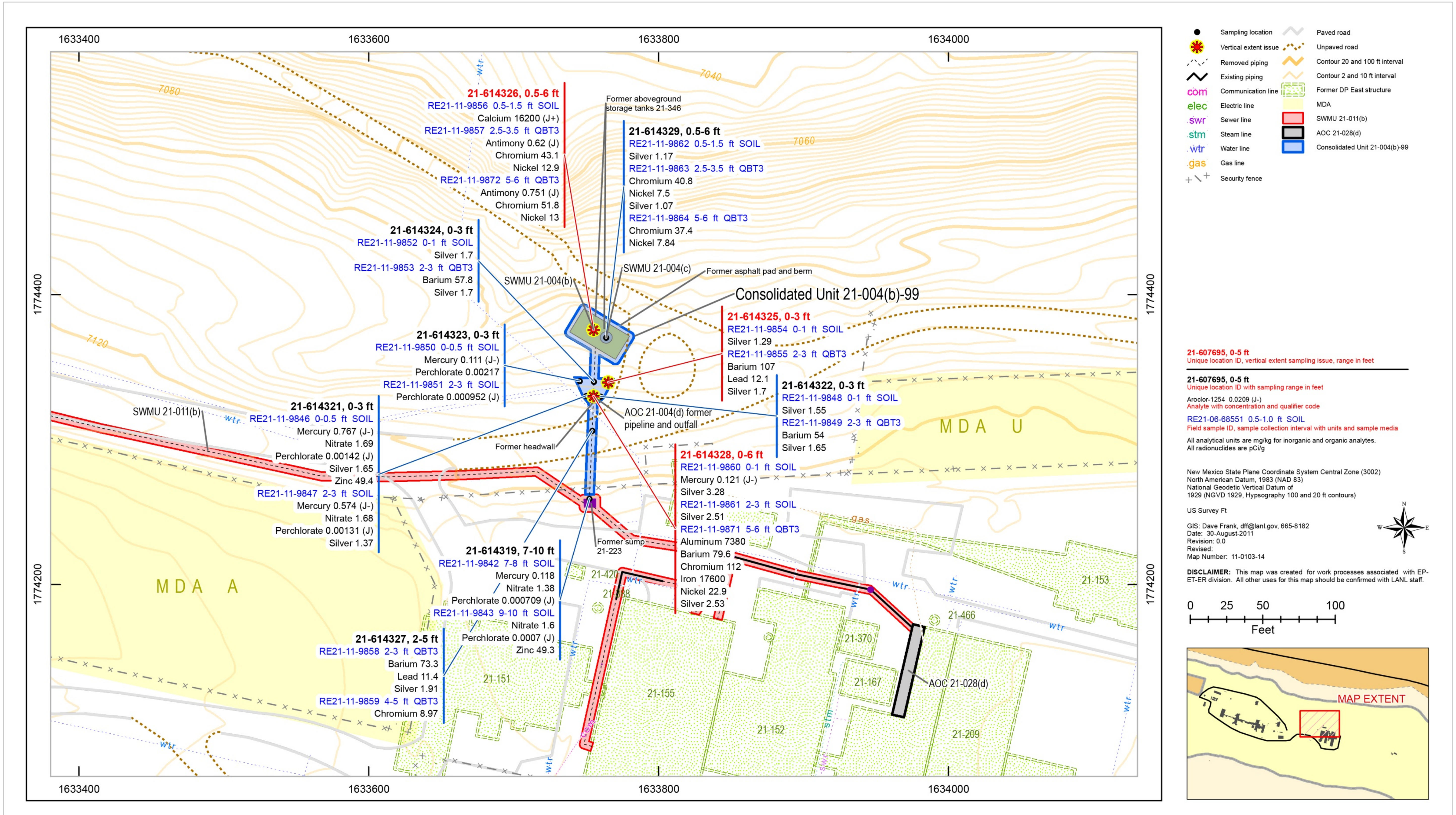

Figure 7.1-1 Inorganic chemicals detected or detected above BVs at Consolidated Unit 21-004(b)-99

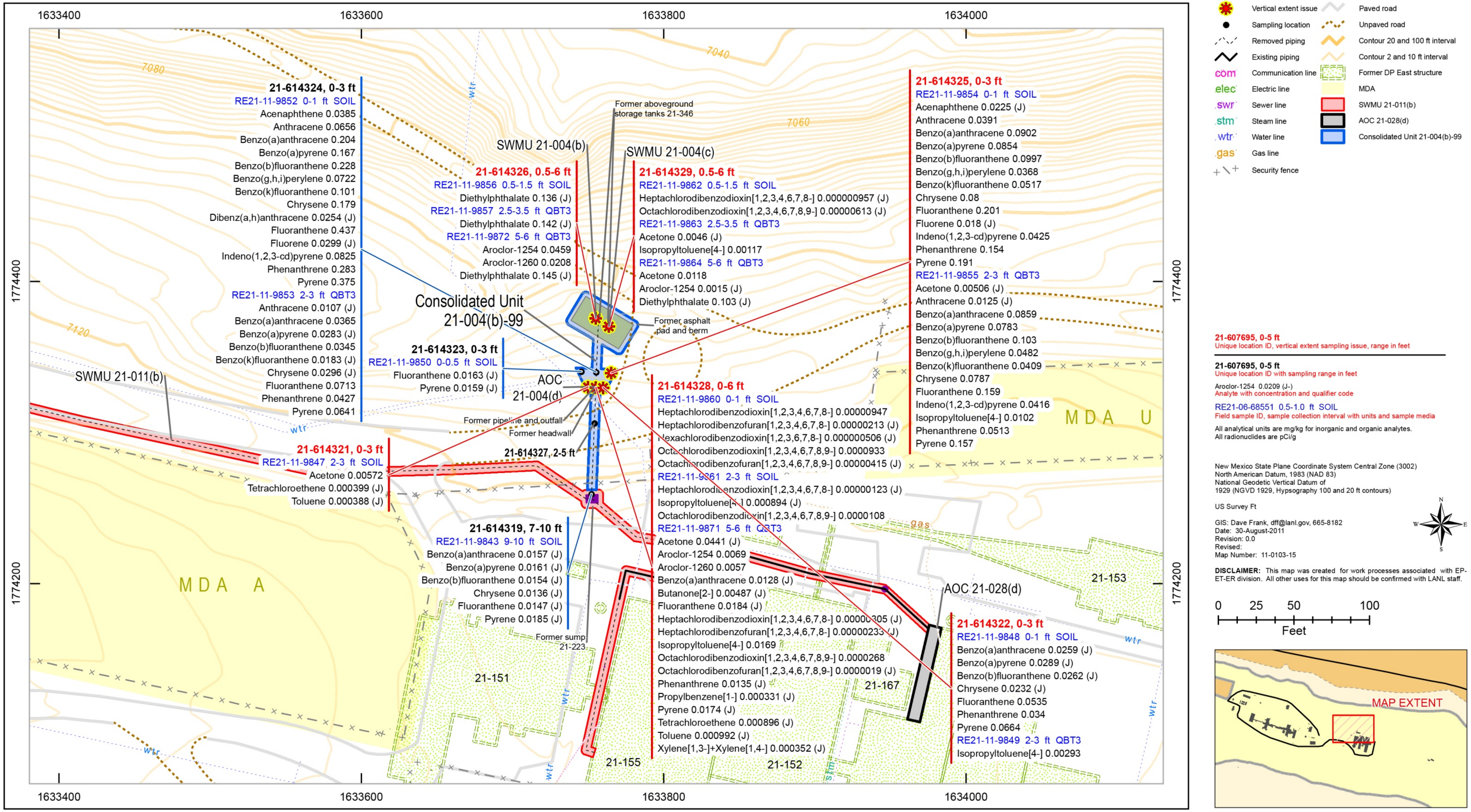

Figure 7.1-2 Organic chemicals detected at Consolidated Unit 21-004(b)-99

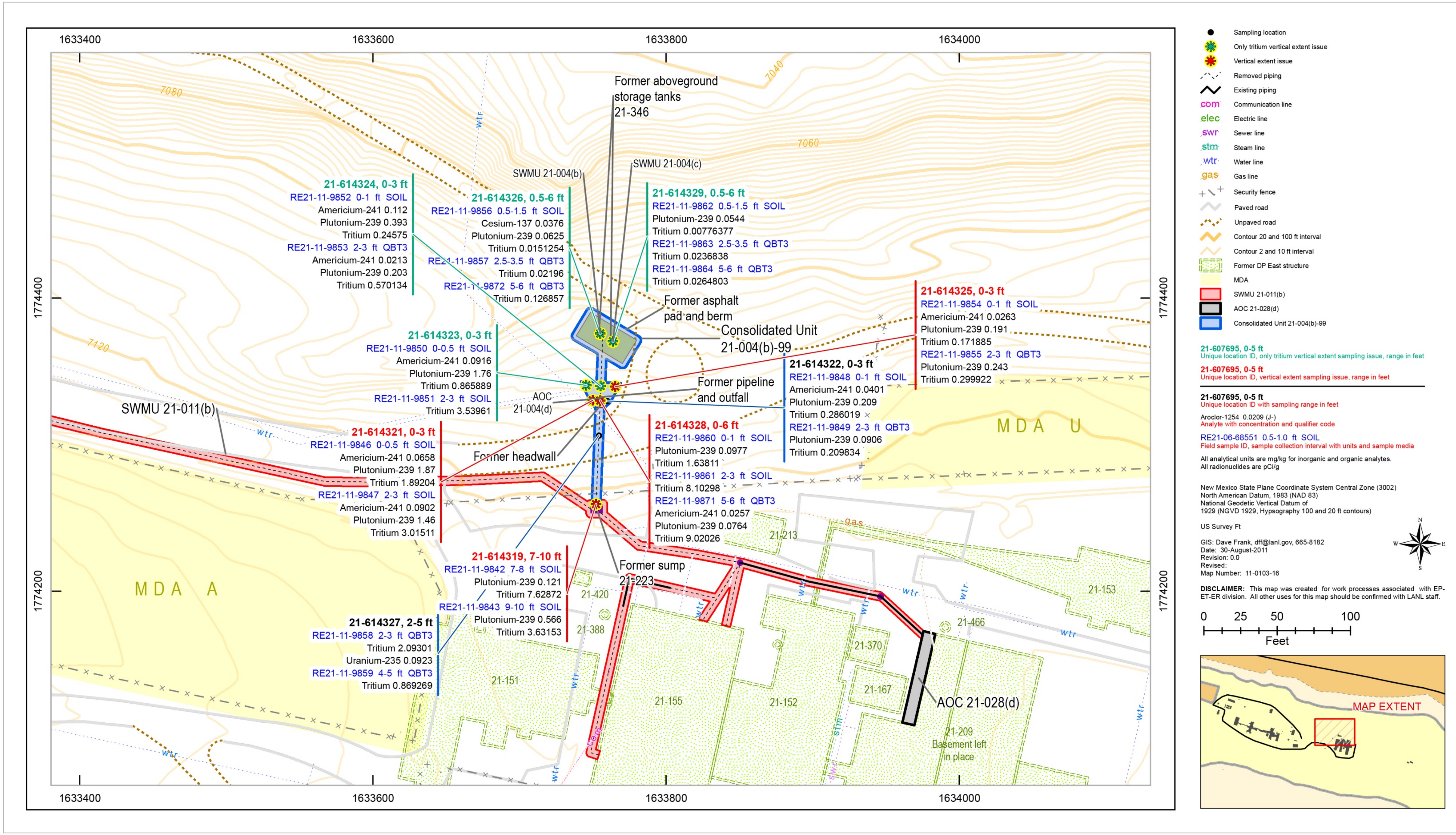

Figure 7.1-3 Radionuclides detected or detected above BVs/FVs at Consolidated Unit 21-004(b)-99

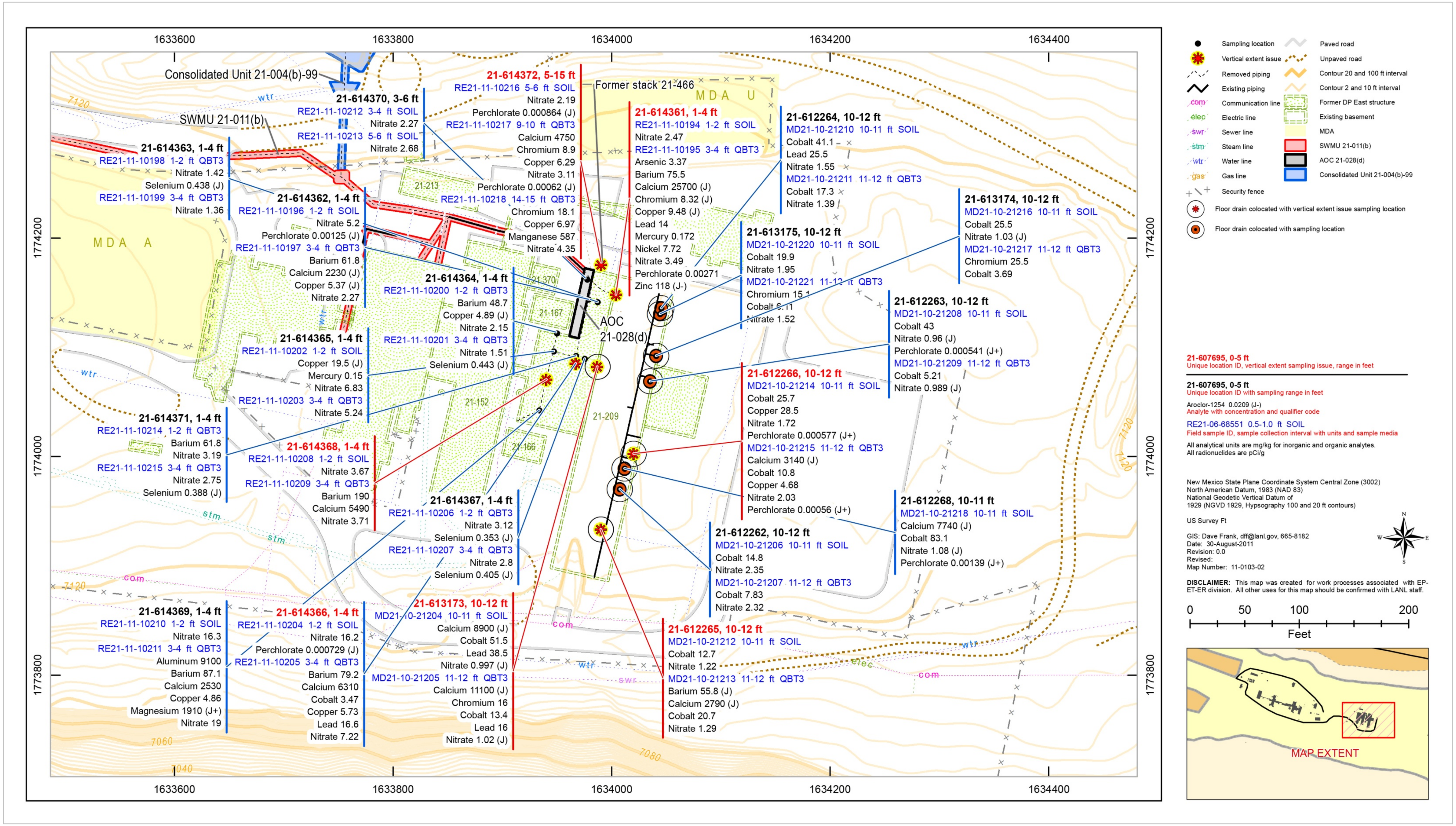

Figure 7.1-4 Inorganic chemicals detected or detected above BVs at former building 21-209 and associated former structure 21-466 footprints

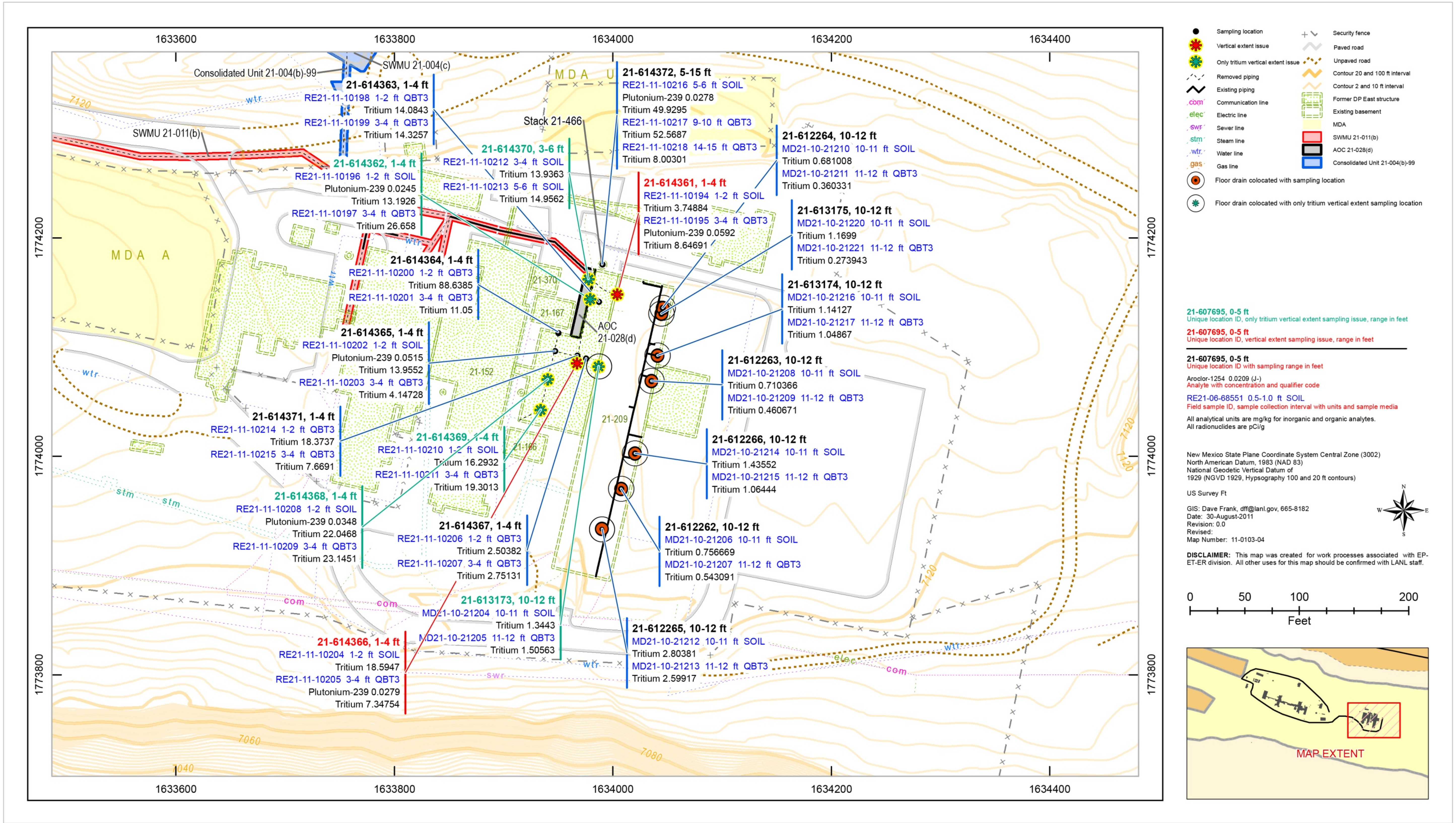

Figure 7.1-5 Radionuclides detected or detected above BVs/FVs at former building 21-209 and associated former structure 21-466 footprints

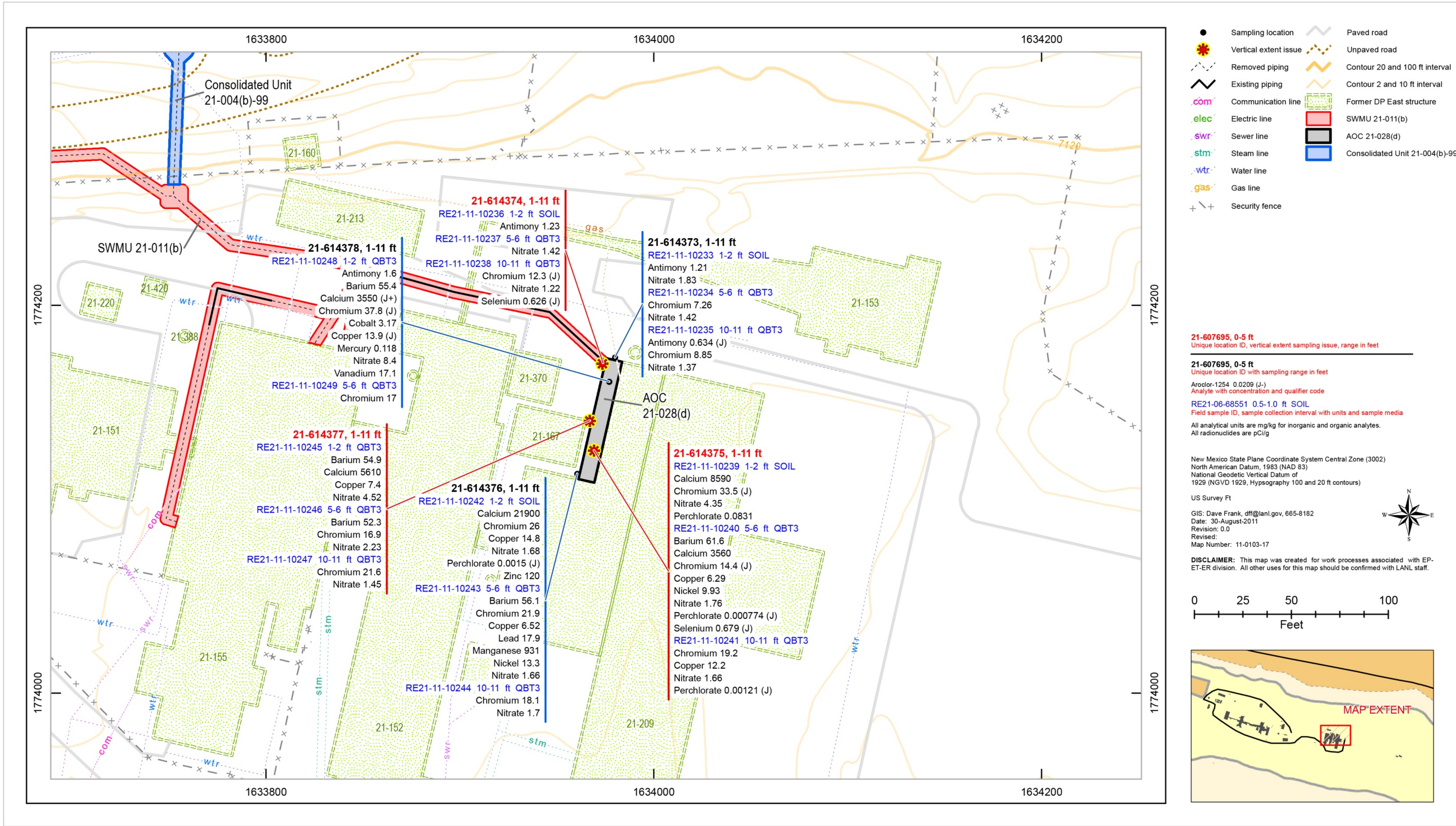

Figure 7.1-6 Inorganic chemicals detected or detected above BVs at AOC 21-028(d)

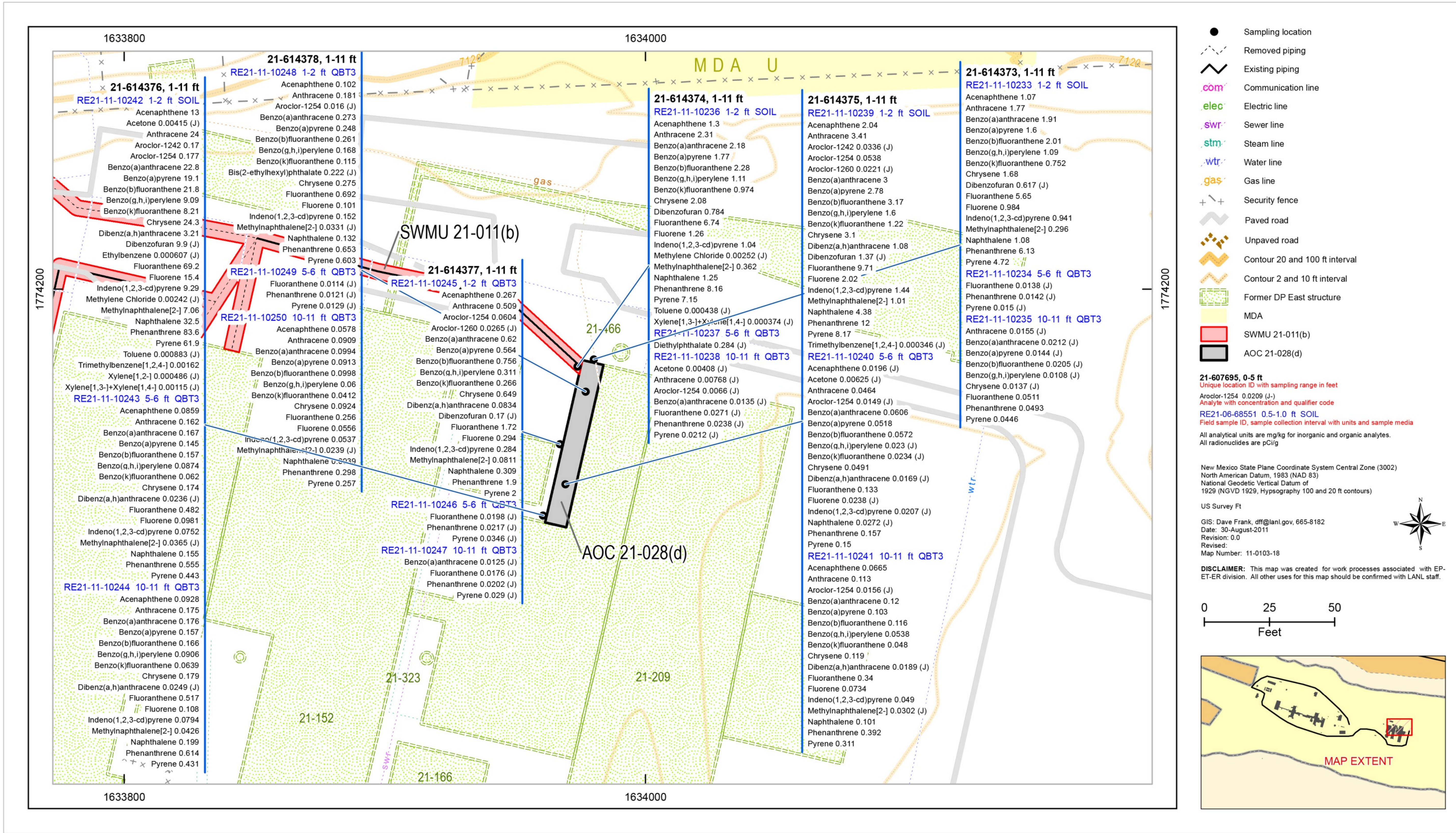

Figure 7.1-7 Organic chemicals detected at AOC 21-028(d)

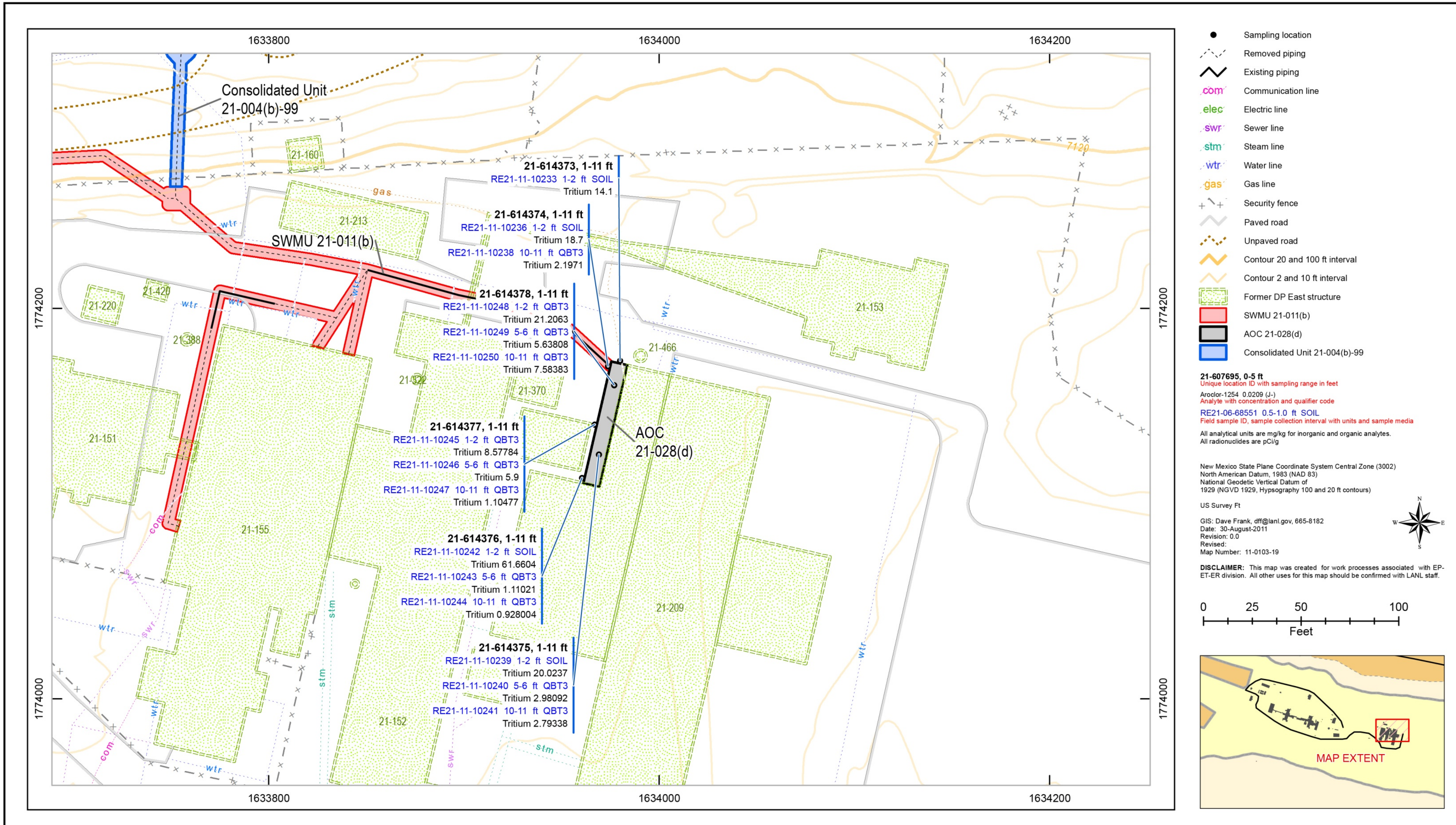

Figure 7.1-8 Radionuclides detected or detected above BVs/FVs at AOC 21-028(d)

Table 1.3-1
DP Site Aggregate Delayed Sites and DP East Building Footprints under Investigation

Consolidated Unit	SWMU/AOC	Brief Description	Previous Investigation(s)	2010–2011 Investigation
21-004(b)-99	SWMU 21-004(b)	Aboveground overflow holding tank	1994 RFI (LANL 1996, 054828, pp. 32–33).	Tank removed and sampled beneath as directed in the Delayed Sites work plan (LANL 2009, 108166.9).
	SWMU 21-004(c)	Aboveground overflow holding tank	1994 RFI (LANL 1996, 054828, pp. 32–33).	Tank removed and sampled beneath as directed in the Delayed Sites work plan (LANL 2009, 108166.9).
	AOC 21-004(d)	Waste line and outfall	1988 investigation (LANL 1991, 007529, p. 15-96).	Waste line removed and sampled beneath; outfall sampled as directed in the Delayed Sites work plan (LANL 2009, 108166.9).
	SWMU 21-011(b)	Acid waste line	None	A portion of the piping outside of MDA T removed; sump removed; sampled beneath as directed in the Delayed Sites work plan (LANL 2009, 108166.9).
	AOC 21-028(d)	Loading dock	1994 RFI (LANL 1996, 054828, p. 37-47).	Sampled as directed in the DP East Building Footprints work plan (LANL 2010, 110082.4).
	n/a*	Former building 21-152 and associated former structures footprints	None	Piping between former structures 21-166 and 21-167 removed and sampled beneath. Remainder of area sampled as directed in the DP East Building Footprints work plan (LANL 2010, 110082.4).
	n/a	Former building 21-155 and associated former structures footprints	None	Former cooling tower 21-220 piping removed and sampled beneath. Remainder of area sampled as directed (LANL 2010, 110082.4).
	n/a	Former building 21-209 and associated former structure footprints	None	Piping on the west side of the building (dry box area) removed and sampled beneath in 2011. Samples collected near floor drains in the basement along the east side of the building in 2010. Area sampled and structures removed as directed in the DP East Building Footprints work plan (LANL 2010, 110082.4)

*n/a = Not applicable.

Table 4.2-1
Surveyed Coordinates and Corresponding Work Plan Locations for Locations Sampled

Site	Location ID	Easting (ft)	Northing (ft)	Work Plan Location ID	Work Plan
21-004(b)-99	21-614319	1633752.43	1774259.37	1	DP Delayed Sites (LANL 2009, 108166.9)
21-004(b)-99	21-614321	1633750.19	1774330.24	3	DP Delayed Sites (LANL 2009, 108166.9)
21-004(b)-99	21-614322	1633760.19	1774329.91	5	DP Delayed Sites (LANL 2009, 108166.9)
21-004(b)-99	21-614323	1633745.59	1774340.49	6	DP Delayed Sites (LANL 2009, 108166.9)
21-004(b)-99	21-614324	1633755.58	1774340.10	7	DP Delayed Sites (LANL 2009, 108166.9)
21-004(b)-99	21-614325	1633765.58	1774339.70	8	DP Delayed Sites (LANL 2009, 108166.9)
21-004(b)-99	21-614326	1633755.17	1774375.94	9	DP Delayed Sites (LANL 2009, 108166.9)
21-004(b)-99	21-614327	1633754.27	1774306.38	2	DP Delayed Sites (LANL 2009, 108166.9)
21-004(b)-99	21-614328	1633755.19	1774330.03	4	DP Delayed Sites (LANL 2009, 108166.9)
21-004(b)-99	21-614329	1633764.00	1774370.52	10	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613813	1633071.87	1774343.50	29	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613814	1633118.78	1774354.99	28	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613815	1633756.77	1774252.59	13	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613816	1633781.74	1774231.20	12	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613818	1633317.45	1774331.12	24	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613819	1633367.16	1774319.83	23	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613820	1633415.22	1774308.15	22	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613821	1633463.54	1774297.57	21	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613822	1633513.14	1774287.20	20	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613823	1633567.29	1774274.98	19	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613824	1633613.77	1774274.40	18	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613825	1633665.31	1774275.75	17	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613826	1633715.96	1774278.26	16	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613827	1633748.51	1774256.39	15	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613828	1633217.71	1774354.43	26	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613829	1633266.81	1774343.14	25	DP Delayed Sites (LANL 2009, 108166.9)

Table 4.2-1 (continued)

Site	Location ID	Easting (ft)	Northing (ft)	Work Plan Location ID	Work Plan
21-011(b)	21-613834	1633752.16	1774105.46	1	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613835	1633758.77	1774135.19	2	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613836	1633895.63	1774207.48	9	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613837	1633946.48	1774196.57	10	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613838	1633821.13	1774225.24	11	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613839	1633832.64	1774195.77	6	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613847	1633165.00	1774366.74	27	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613848	1633850.68	1774219.67	8	DP Delayed Sites (LANL 2009, 108166.9)
21-011(b)	21-613849	1633766.75	1774170.03	3	DP Delayed Sites (LANL 2009, 108166.9)
21-028(d)	21-614373	1633980.06	1774173.10	BH-1	DP East Building Footprints (LANL 2010, 110082.4)
21-028(d)	21-614374	1633973.91	1774170.33	BH-2	DP East Building Footprints (LANL 2010, 110082.4)
21-028(d)	21-614375	1633969.20	1774125.21	BH-6	DP East Building Footprints (LANL 2010, 110082.4)
21-028(d)	21-614376	1633960.64	1774113.26	BH-4	DP East Building Footprints (LANL 2010, 110082.4)
21-028(d)	21-614377	1633967.15	1774140.53	BH-3	DP East Building Footprints (LANL 2010, 110082.4)
21-028(d)	21-614378	1633977.04	1774160.68	BH-5	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614180	1633872.24	1774193.10	1	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614181	1633880.74	1774191.10	2	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614182	1633906.15	1774186.23	4	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614183	1633922.19	1774162.16	6	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614184	1633917.73	1774142.66	7	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614185	1633913.27	1774123.17	8	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614186	1633908.80	1774103.67	9	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614187	1633904.34	1774084.18	10	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614188	1633895.41	1774045.19	12	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614189	1633890.95	1774025.69	13	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614190	1633886.49	1774006.19	14	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614191	1633882.02	1773986.70	15	DP East Building Footprints (LANL 2010, 110082.4)

Table 4.2-1 (continued)

Site	Location ID	Easting (ft)	Northing (ft)	Work Plan Location ID	Work Plan
TA-21-152	21-614192	1633877.56	1773967.20	16	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614193	1633854.16	1773954.89	18	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614194	1633837.96	1773976.24	20	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614195	1633842.42	1773995.74	21	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614196	1633846.89	1774015.23	22	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614197	1633855.81	1774054.22	24	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614198	1633882.59	1774171.20	30	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614199	1633878.13	1774151.70	29	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614200	1633851.35	1774034.73	23	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614201	1633873.66	1774132.20	28	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614202	1633869.20	1774112.71	27	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614203	1633864.74	1774093.21	26	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614204	1633887.88	1774191.82	3	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614205	1633926.77	1774183.05	5	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614206	1633899.88	1774064.68	11	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614207	1633873.66	1773950.16	17	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614208	1633833.72	1773959.23	19	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614209	1633860.27	1774073.72	25	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614210	1633901.69	1774166.73	31	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614211	1633897.23	1774147.24	32	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614212	1633888.30	1774108.25	34	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614213	1633883.84	1774088.75	35	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614214	1633879.38	1774069.25	36	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614215	1633874.91	1774049.76	37	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614216	1633870.45	1774030.26	38	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614217	1633861.52	1773991.27	40	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614218	1633857.06	1773971.78	41	DP East Building Footprints (LANL 2010, 110082.4)

Table 4.2-1 (continued)

Site	Location ID	Easting (ft)	Northing (ft)	Work Plan Location ID	Work Plan
TA-21-152	21-614219	1633846.89	1774081.14	61	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614220	1633892.76	1774127.74	33	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614221	1633865.99	1774010.77	39	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614222	1633932.91	1774171.97	42	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614223	1633949.46	1774152.16	44	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614224	1633957.60	1774161.55	43	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614225	1633909.96	1774012.61	49	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614226	1633931.51	1774144.37	45	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614227	1633938.35	1774102.09	51	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614228	1633908.63	1774046.42	53	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614229	1633901.80	1774014.14	54	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614230	1633919.66	1774093.86	52	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614231	1633950.71	1774133.92	46	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614232	1633951.26	1774122.91	47	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614233	1633932.15	1774017.67	48	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614234	1633920.71	1774000.73	50	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614235	1633914.49	1774245.36	55	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614236	1634027.73	1774220.17	56	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614237	1634109.91	1774200.50	57	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614238	1633876.09	1774163.80	58	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614239	1633915.96	1774058.59	59	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-152	21-614240	1633844.32	1774058.94	60	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613977	1633777.60	1774159.15	9	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613978	1633767.73	1774159.07	8	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613979	1633825.77	1774178.56	10	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613980	1633820.85	1774160.25	12	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613981	1633817.45	1774147.67	14	DP East Building Footprints (LANL 2010, 110082.4)

Table 4.2-1 (continued)

Site	Location ID	Easting (ft)	Northing (ft)	Work Plan Location ID	Work Plan
TA-21-155	21-613982	1633815.88	1774130.53	16	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613983	1633808.18	1774146.13	20	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613984	1633802.57	1774121.19	21	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613985	1633808.97	1774102.91	22	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613986	1633800.73	1774091.91	23	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613987	1633805.53	1774083.74	24	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613988	1633797.55	1774076.48	25	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613989	1633794.01	1774177.03	1	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613990	1633782.75	1774127.25	2	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613991	1633771.94	1774078.93	3	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613992	1633816.05	1774070.22	7	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613993	1633776.94	1774034.03	4	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613994	1633764.61	1773981.63	6	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613995	1633741.72	1774014.45	5	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613996	1633822.09	1774170.29	11	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613997	1633816.92	1774151.32	13	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613998	1633814.07	1774138.46	15	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-613999	1633810.31	1774121.93	18	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614000	1633807.38	1774109.15	19	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614001	1633810.31	1774125.32	17	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614002	1633840.23	1774176.30	26	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614003	1633838.07	1774168.99	27	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614004	1633831.78	1774134.94	29	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614005	1633823.66	1774129.07	30	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614006	1633818.06	1774111.28	32	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614007	1633826.10	1774108.83	33	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614008	1633818.50	1774103.48	34	DP East Building Footprints (LANL 2010, 110082.4)

Table 4.2-1 (continued)

Site	Location ID	Easting (ft)	Northing (ft)	Work Plan Location ID	Work Plan
TA-21-155	21-614009	1633817.32	1774098.20	37	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614010	1633824.57	1774097.90	38	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614011	1633839.19	1774154.62	28	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614012	1633830.23	1774115.06	31	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614013	1633814.86	1774102.29	35	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614014	1633821.10	1774101.01	36	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614015	1633852.87	1774164.11	39	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614016	1633810.02	1774242.16	47	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614017	1633814.69	1774259.69	45	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614018	1633842.87	1774245.14	44	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614019	1633872.62	1774230.30	48	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614020	1633875.38	1774245.45	46	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614021	1633842.89	1774184.25	40	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614022	1633786.81	1774201.28	41	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614023	1633753.83	1774207.79	42	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614024	1633742.98	1774209.16	49	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614025	1633714.98	1774201.79	43	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-155	21-614026	1633758.37	1774184.17	50	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-209	21-612262	1634007.65	1773970.40	19	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-209	21-612263	1634035.41	1774069.20	16	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-209	21-612264	1634045.61	1774136.11	13	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-209	21-612265	1633990.10	1773933.63	Added (floor drain found after equipment removed)	not applicable
TA-21-209	21-612266	1634020.23	1774002.91	17	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-209	21-612268	1634012.00	1773989.41	18	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-209	21-613173	1633987.01	1774082.45	Added (floor drain found after equipment removed)	Not applicable
TA-21-209	21-613174	1634040.77	1774092.59	15	DP East Building Footprints (LANL 2010, 110082.4)

Table 4.2-1 (continued)

Site	Location ID	Easting (ft)	Northing (ft)	Work Plan Location ID	Work Plan
TA-21-209	21-613175	1634044.38	1774130.75	14	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-209	21-614361	1634003.91	1774148.52	2	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-209	21-614362	1633979.14	1774144.17	3	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-209	21-614363	1633987.24	1774141.57	4	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-209	21-614364	1633950.21	1774113.13	5	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-209	21-614365	1633947.06	1774096.58	6	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-209	21-614366	1633967.07	1774085.45	8	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-209	21-614367	1633975.47	1774089.92	9	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-209	21-614368	1633940.44	1774070.51	10	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-209	21-614369	1633934.05	1774042.64	11	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-209	21-614370	1633977.87	1774162.42	1	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-209	21-614371	1633967.52	1774092.58	7	DP East Building Footprints (LANL 2010, 110082.4)
TA-21-209	21-614372	1633990.49	1774175.96	12	DP East Building Footprints (LANL 2010, 110082.4)

Table 4.2-2
Field-Screening Results for Samples Collected

Sample ID	Location ID	PID Reading (ppm)	Alpha Reading* (dpm)	Beta/Gamma Reading* (dpm)	Depth (ft)
Consolidated Unit 21-004(b)-99					
RE21-11-9842	21-614319	0	31	466	7–8
RE21-11-9843	21-614319	0	31	466	9–10
RE21-11-9846	21-614321	0	0	140	0–0.5
RE21-11-9847	21-614321	0	15	280	2–3
RE21-11-9848	21-614322	0	15	140	0–1
RE21-11-9849	21-614322	0	15	280	2–3
RE21-11-9850	21-614323	0	31	280	0–0.5
RE21-11-9851	21-614323	0	15	280	2–3
RE21-11-9852	21-614324	0	31	280	0–1
RE21-11-9853	21-614324	0	46	280	2–3
RE21-11-9854	21-614325	0	31	280	0–1
RE21-11-9855	21-614325	0	15	140	2–3
RE21-11-9856	21-614326	0	15	280	0.5–1.5
RE21-11-9857	21-614326	0	31	560	2.5–3.5
RE21-11-9872	21-614326	0	15	560	5–6
RE21-11-9858	21-614327	0	15	280	2–3
RE21-11-9859	21-614327	0	15	280	4–5
RE21-11-9860	21-614328	0	15	280	0–1
RE21-11-9861	21-614328	0	15	280	2–3
RE21-11-9871	21-614328	0	31	420	5–6
RE21-11-9862	21-614329	0	15	420	0.5–1.5
RE21-11-9863	21-614329	0	15	420	2.5–3.5
RE21-11-9864	21-614329	0	46	280	5–6
SWMU 21-011(b)					
RE21-11-3822	21-613813	0	0	305	4–5
RE21-11-3823	21-613813	0	56	305	6–7
RE21-11-3824	21-613814	0	0	305	6–7
RE21-11-3825	21-613814	0	0	0	8–9
RE21-11-3826	21-613815	0	31	466	7–8
RE21-11-3827	21-613815	0	31	466	9–10
RE21-11-3828	21-613816	0	46	420	7–8
RE21-11-3829	21-613816	0	62	700	9–10
RE21-11-3832	21-613818	83.6	31	212	6–7
RE21-11-3833	21-613818	0	6	288	8–9
RE21-11-3834	21-613819	77.6	19	742	5–6
RE21-11-3835	21-613819	0	15	511	7–8

Table 4.2-2 (continued)

Sample ID	Location ID	PID Reading (ppm)	Alpha Reading* (dpm)	Beta/Gamma Reading* (dpm)	Depth (ft)
RE21-11-3836	21-613820	0	25	650	4–5
RE21-11-3837	21-613820	0	27	612	6–7
RE21-11-3838	21-613821	0	28	1219	4–5
RE21-11-3839	21-613821	0	14	914	6–7
RE21-11-3840	21-613822	0	42	1219	4–5
RE21-11-3841	21-613822	0	14	610	6–7
RE21-11-3842	21-613823	0	14	610	4–5
RE21-11-3843	21-613823	0	28	610	6–7
RE21-11-3844	21-613824	0	28	305	4–5
RE21-11-3845	21-613824	0	0	1219	6–7
RE21-11-3846	21-613825	0	28	914	4–5
RE21-11-3847	21-613825	0	28	610	6–7
RE21-11-3848	21-613826	0	0	914	4–5
RE21-11-3849	21-613826	0	28	610	6–7
RE21-11-3850	21-613827	0	0	305	4–5
RE21-11-3851	21-613827	0	0	305	6–7
RE21-11-3852	21-613828	0	14	610	5–6
RE21-11-3853	21-613828	0	0	610	7–8
RE21-11-3854	21-613829	0	42	610	5–6
RE21-11-3855	21-613829	0	141	305	7–8
RE21-11-3864	21-613834	0	31	466	1–2
RE21-11-3865	21-613834	0	15	699	3–4
RE21-11-3866	21-613835	0	46	699	2–3
RE21-11-3867	21-613835	0	46	466	3–4
RE21-11-3868	21-613836	0	34	1120	10–11
RE21-11-3869	21-613836	0	34	990	12–13
RE21-11-3870	21-613837	0	28	1090	10–11
RE21-11-3871	21-613837	0	28	960	12–13
RE21-11-3872	21-613838	0	77	840	7–8
RE21-11-3873	21-613838	0	77	700	9–10
RE21-11-3874	21-613839	0	46	560	5–6
RE21-11-3875	21-613839	0	46	560	7–8
RE21-11-3890	21-613847	0	226	305	6–7
RE21-11-3891	21-613847	0	183	305	8–9
RE21-11-3892	21-613848	0	57	900	10–11
RE21-11-3893	21-613848	0	57	1010	12–13
RE21-11-3894	21-613849	0	34	710	2–3
RE21-11-3895	21-613849	0	17	700	4–5

Table 4.2-2 (continued)

Sample ID	Location ID	PID Reading (ppm)	Alpha Reading* (dpm)	Beta/Gamma Reading* (dpm)	Depth (ft)
Former Building 21-152					
RE21-11-7843	21-614180	0	15	699	1–2
RE21-11-7844	21-614180	0	0	699	3–4
RE21-11-7845	21-614180	0	45	466	5–6
RE21-11-7846	21-614181	0	31	699	1–2
RE21-11-7847	21-614181	0	0	932	3–4
RE21-11-7848	21-614181	0	0	932	5–6
RE21-11-7849	21-614182	0	31	699	6–7
RE21-11-7850	21-614182	0	0	699	8–9
RE21-11-7851	21-614183	0	15	699	6–7
RE21-11-7852	21-614183	0	0	699	8–9
RE21-11-7853	21-614184	0	31	466	6–7
RE21-11-7854	21-614184	0	0	932	8–9
RE21-11-7855	21-614185	0	0	466	6–7
RE21-11-7856	21-614185	0	31	699	8–9
RE21-11-7857	21-614186	0	15	699	6–7
RE21-11-7858	21-614186	0	93	932	8–9
RE21-11-7859	21-614187	0	0	699	6–7
RE21-11-7860	21-614187	0	0	233	8–9
RE21-11-7861	21-614188	0	31	466	6–7
RE21-11-7862	21-614188	0	62	466	8–9
RE21-11-7863	21-614189	0	77	466	6–7
RE21-11-7864	21-614189	0	108	233	8–9
RE21-11-7865	21-614190	0	7	73	6–7
RE21-11-7866	21-614190	0	7	73	8–9
RE21-11-7867	21-614191	0	0	37	6–7
RE21-11-7868	21-614191	0	21	110	8–9
RE21-11-7869	21-614192	0	7	37	6–7
RE21-11-7870	21-614192	0	0	0	8–9
RE21-11-7871	21-614193	0	0	233	6–7
RE21-11-7872	21-614193	0	62	466	8–9
RE21-11-7873	21-614194	0	15	699	6–7
RE21-11-7874	21-614194	0	31	699	8–9
RE21-11-7875	21-614195	0	31	699	6–7
RE21-11-7876	21-614195	0	0	466	8–9
RE21-11-7877	21-614196	0	31	699	6–7
RE21-11-7878	21-614196	0	31	699	8–9
RE21-11-7879	21-614197	0	0	466	6–7
RE21-11-7880	21-614197	0	0	466	8–9

Table 4.2-2 (continued)

Sample ID	Location ID	PID Reading (ppm)	Alpha Reading* (dpm)	Beta/Gamma Reading* (dpm)	Depth (ft)
RE21-11-7881	21-614198	0	15	466	6–7
RE21-11-7882	21-614198	0	0	699	8–9
RE21-11-7883	21-614199	0	31	699	6–7
RE21-11-7884	21-614199	0	0	466	8–9
RE21-11-7885	21-614200	0	0	699	6–7
RE21-11-7886	21-614200	0	15	466	8–9
RE21-11-7887	21-614201	0	15	699	6–7
RE21-11-7888	21-614201	0	46	233	8–9
RE21-11-7889	21-614202	0	0	466	6–7
RE21-11-7890	21-614202	0	31	699	8–9
RE21-11-7891	21-614203	0	0	365	6–7
RE21-11-7892	21-614203	0	21	36	8–9
RE21-11-7893	21-614204	0	0	699	6–7
RE21-11-7894	21-614204	0	31	466	8–9
RE21-11-7895	21-614205	0	0	699	6–7
RE21-11-7896	21-614205	0	0	932	8–9
RE21-11-7897	21-614206	0	0	699	6–7
RE21-11-7898	21-614206	0	0	233	8–9
RE21-11-7899	21-614207	0	7	73	6–7
RE21-11-7900	21-614207	0	14	73	8–9
RE21-11-7901	21-614208	0	0	699	6–7
RE21-11-7902	21-614208	0	15	699	8–9
RE21-11-7903	21-614209	0	31	699	6–7
RE21-11-7904	21-614209	0	0	466	8–9
RE21-11-7905	21-614210	0	0	699	1–2
RE21-11-7906	21-614210	0	15	466	3–4
RE21-11-7907	21-614211	0	31	233	1–2
RE21-11-7908	21-614211	0	62	466	3–4
RE21-11-7909	21-614212	0	62	466	1–2
RE21-11-7910	21-614212	0	108	466	3–4
RE21-11-7911	21-614213	0	93	466	1–2
RE21-11-7912	21-614213	0	108	466	3–4
RE21-11-7913	21-614214	0	0	932	1–2
RE21-11-7914	21-614214	0	15	466	3–4
RE21-11-7915	21-614215	0	31	466	1–2
RE21-11-7916	21-614215	0	0	466	3–4
RE21-11-7917	21-614216	0	0	466	1–2
RE21-11-7918	21-614216	0	31	466	3–4
RE21-11-7919	21-614217	0	77	466	1–2

Table 4.2-2 (continued)

Sample ID	Location ID	PID Reading (ppm)	Alpha Reading* (dpm)	Beta/Gamma Reading* (dpm)	Depth (ft)
RE21-11-7920	21-614217	0	31	466	3–4
RE21-11-7921	21-614218	0	31	466	1–2
RE21-11-7922	21-614218	0	31	466	3–4
RE21-11-7923	21-614219	0	31	233	1–2
RE21-11-7924	21-614219	0	15	433	3–4
RE21-11-7925	21-614220	0	15	466	1–2
RE21-11-7926	21-614220	0	46	466	3–4
RE21-11-7927	21-614221	0	0	233	1–2
RE21-11-7928	21-614221	0	31	233	3–4
RE21-11-7933	21-614222	0	77	466	1–2
RE21-11-7934	21-614222	0	15	699	3–4
RE21-11-7997	21-614222	0	31	466	5–6
RE21-11-7936	21-614223	0	62	466	1–2
RE21-11-7937	21-614223	0	0	699	3–4
RE21-11-7938	21-614223	0	0	466	5–6
RE21-11-7939	21-614224	0	0	466	1–2
RE21-11-7940	21-614224	0	62	466	3–4
RE21-11-7941	21-614225	0	31	466	4–5
RE21-11-7942	21-614225	0	0	73	6–7
RE21-11-7963	21-614226	0	62	466	1–2
RE21-11-7964	21-614226	0	62	699	3–4
RE21-11-7965	21-614226	0	77	699	5–6
RE21-11-7966	21-614227	0	31	466	2–3
RE21-11-7967	21-614227	0	31	466	4–5
RE21-11-7968	21-614228	0	31	420	7–8
RE21-11-7969	21-614228	0	46	560	9–10
RE21-11-7970	21-614229	0	0	560	7–8
RE21-11-7971	21-614229	0	46	560	9–10
RE21-11-7972	21-614230	0	46	560	7–8
RE21-11-7973	21-614230	0	46	700	9–10
RE21-11-7974	21-614231	0	15	466	1–2
RE21-11-7975	21-614231	0	0	466	3–4
RE21-11-7976	21-614232	0	0	466	1–2
RE21-11-7977	21-614232	0	31	466	3–4
RE21-11-7978	21-614233	0	46	233	4–5
RE21-11-7979	21-614233	0	31	699	6–7
RE21-11-7980	21-614234	0	0	699	4–5
RE21-11-7981	21-614234	0	31	466	6–7
RE21-11-7982	21-614235	0	31	466	0.5–1.5

Table 4.2-2 (continued)

Sample ID	Location ID	PID Reading (ppm)	Alpha Reading* (dpm)	Beta/Gamma Reading* (dpm)	Depth (ft)
RE21-11-7983	21-614235	0	46	466	2.5–3.5
RE21-11-7984	21-614236	0	31	466	0.5–1.5
RE21-11-7985	21-614236	0	46	466	2.5–3.5
RE21-11-7986	21-614237	0	31	466	0–1
RE21-11-7987	21-614237	0	31	699	2–3
RE21-11-7988	21-614238	0	14	73	5–6
RE21-11-7989	21-614238	0	21	36	9–10
RE21-11-7990	21-614238	0	7	0	14–15
RE21-11-7991	21-614239	0	14	37	5–6
RE21-11-7992	21-614239	0	21	73	9–10
RE21-11-7993	21-614239	0	0	37	14–15
RE21-11-7994	21-614240	0	31	699	5–6
RE21-11-7995	21-614240	0	0	466	9–10
RE21-11-7996	21-614240	0	31	466	14–15
Former Building 21-155					
RE21-11-5777	21-613977	0	0	0	4–5
RE21-11-5778	21-613977	0	0	0	2–3
RE21-11-5779	21-613978	0	92	466	2–3
RE21-11-5780	21-613978	0	30	466	4–5
RE21-11-5781	21-613979	0	0	0	5–6
RE21-11-5782	21-613979	0	30	466	7–8
RE21-11-5783	21-613980	0	31	466	6–7
RE21-11-5784	21-613980	0	0	233	8–9
RE21-11-5785	21-613981	0	31	233	6–7
RE21-11-5786	21-613981	0	31	699	8–9
RE21-11-5787	21-613982	0	31	699	6–7
RE21-11-5788	21-613982	0	15	466	8–9
RE21-11-5789	21-613983	0	15	932	6–7
RE21-11-5790	21-613983	0	0	932	8–9
RE21-11-5791	21-613984	0	0	932	6–7
RE21-11-5792	21-613984	0	92	932	8–9
RE21-11-5793	21-613985	0	46	932	6–7
RE21-11-5794	21-613985	0	15	932	8–9
RE21-11-5795	21-613986	0	31	466	6–7
RE21-11-5796	21-613986	0	31	699	8–9
RE21-11-5797	21-613987	0	62	466	6–7
RE21-11-5798	21-613987	0	0	932	8–9
RE21-11-5799	21-613988	0	0	699	6–7
RE21-11-5800	21-613988	0	31	466	8–9

Table 4.2-2 (continued)

Sample ID	Location ID	PID Reading (ppm)	Alpha Reading* (dpm)	Beta/Gamma Reading* (dpm)	Depth (ft)
RE21-11-5801	21-613989	0	31	0	1–2
RE21-11-5802	21-613989	0	31	677	3–4
RE21-11-5803	21-613990	0	15	466	1–2
RE21-11-5804	21-613990	0	46	466	3–4
RE21-11-5805	21-613991	0	46	466	1–2
RE21-11-5806	21-613991	0	46	466	3–4
RE21-11-5807	21-613992	0	30	932	1–2
RE21-11-5808	21-613992	0	46	466	3–4
RE21-11-5809	21-613993	0	31	233	1–2
RE21-11-5810	21-613993	0	15	466	3–4
RE21-11-5811	21-613994	0	0	0	1–2
RE21-11-5812	21-613994	0	0	466	3–4
RE21-11-5813	21-613995	0	46	699	1–2
RE21-11-5814	21-613995	0	15	466	3–4
RE21-11-5815	21-613996	0	0	932	5–6
RE21-11-5816	21-613996	0	15	466	7–8
RE21-11-5817	21-613997	0	0	932	6–7
RE21-11-5818	21-613997	0	31	932	8–9
RE21-11-5819	21-613998	0	62	466	6–7
RE21-11-5820	21-613998	0	92	466	8–9
RE21-11-5821	21-613999	0	77	699	6–7
RE21-11-5822	21-613999	0	0	466	8–9
RE21-11-5823	21-614000	0	0	233	6–7
RE21-11-5824	21-614000	0	0	233	8–9
RE21-11-5825	21-614001	0	0	932	20–21
RE21-11-5826	21-614001	0	0	699	30–31
RE21-11-5827	21-614002	0	0	699	5–6
RE21-11-5828	21-614002	0	15	932	7–8
RE21-11-5829	21-614003	0	0	699	5–6
RE21-11-5830	21-614003	0	15	932	7–8
RE21-11-5831	21-614004	0	92	699	5–6
RE21-11-5832	21-614004	0	15	699	7–8
RE21-11-5833	21-614005	0	31	932	5–6
RE21-11-5834	21-614005	0	15	466	7–8
RE21-11-5835	21-614006	0	0	466	5–6
RE21-11-5836	21-614006	0	0	466	7–8
RE21-11-5837	21-614007	0	0	466	5–6
RE21-11-5838	21-614007	0	15	699	7–8
RE21-11-5839	21-614008	0	15	699	5–6

Table 4.2-2 (continued)

Sample ID	Location ID	PID Reading (ppm)	Alpha Reading* (dpm)	Beta/Gamma Reading* (dpm)	Depth (ft)
RE21-11-5840	21-614008	0	0	932	7–8
RE21-11-5841	21-614009	0	31	699	5–6
RE21-11-5842	21-614009	0	31	932	7–8
RE21-11-5843	21-614010	0	62	932	5–6
RE21-11-5844	21-614010	0	15	699	7–8
RE21-11-5845	21-614011	0	31	932	5–6
RE21-11-5846	21-614011	0	0	466	7–8
RE21-11-5847	21-614012	0	15	699	5–6
RE21-11-5848	21-614012	0	62	699	7–8
RE21-11-5849	21-614013	0	46	699	5–6
RE21-11-5850	21-614013	0	92	932	7–8
RE21-11-5851	21-614014	0	31	932	5–6
RE21-11-5852	21-614014	0	15	932	7–8
RE21-11-5853	21-614015	0	0	932	12–13
RE21-11-5854	21-614015	0	0	466	16–17
RE21-11-5855	21-614015	0	0	466	21–22
RE21-11-5856	21-614016	0	0	0	1–2
RE21-11-5857	21-614016	0	62	466	3–4
RE21-11-5858	21-614017	0	62	466	1–2
RE21-11-5859	21-614017	0	107	466	3–4
RE21-11-5860	21-614018	0	15	466	1–2
RE21-11-5861	21-614018	0	0	233	3–4
RE21-11-5862	21-614019	0	15	466	1–2
RE21-11-5863	21-614019	0	46	233	3–4
RE21-11-5864	21-614020	0	0	932	4–5
RE21-11-5865	21-614020	0	0	466	6–7
RE21-11-5866	21-614021	0	46	699	4–5
RE21-11-5867	21-614021	0	46	466	6–7
RE21-11-5868	21-614022	0	0	420	4–5
RE21-11-5869	21-614022	0	31	560	7–8
RE21-11-5870	21-614023	0	31	420	6–7
RE21-11-5871	21-614023	0	46	700	8–9
RE21-11-5872	21-614024	0	62	699	1–2
RE21-11-5873	21-614024	0	62	699	3–4
RE21-11-5874	21-614025	0	31	466	1–2
RE21-11-5875	21-614025	0	15	466	3–4
RE21-11-5876	21-614026	0	46	466	5–6
RE21-11-5877	21-614026	0	15	699	9–10
RE21-11-5878	21-614026	0	15	699	14–15

Table 4.2-2 (continued)

Sample ID	Location ID	PID Reading (ppm)	Alpha Reading* (dpm)	Beta/Gamma Reading* (dpm)	Depth (ft)
Former Building 21-209					
RE21-11-10194	21-614361	0	46	233	1–2
RE21-11-10195	21-614361	0	31	466	3–4
RE21-11-10196	21-614362	0	46	466	1–2
RE21-11-10197	21-614362	0	31	466	3–4
RE21-11-10198	21-614363	0	62	466	1–2
RE21-11-10199	21-614363	0	0	466	3–4
RE21-11-10200	21-614364	0	62	699	1–2
RE21-11-10201	21-614364	0	0	466	3–4
RE21-11-10202	21-614365	0	31	699	1–2
RE21-11-10203	21-614365	0	0	699	3–4
RE21-11-10204	21-614366	0	31	699	1–2
RE21-11-10205	21-614366	0	0	699	3–4
RE21-11-10206	21-614367	0	15	466	1–2
RE21-11-10207	21-614367	0	31	466	3–4
RE21-11-10208	21-614368	0	31	699	1–2
RE21-11-10209	21-614368	0	46	466	3–4
RE21-11-10210	21-614369	0	46	699	1–2
RE21-11-10211	21-614369	0	46	466	3–4
RE21-11-10212	21-614370	0	0	699	3–4
RE21-11-10213	21-614370	0	0	466	5–6
RE21-11-10214	21-614371	0	46	233	1–2
RE21-11-10215	21-614371	0	77	699	3–4
RE21-11-10216	21-614372	0	0	466	5–6
RE21-11-10217	21-614372	0	31	699	9–10
RE21-11-10218	21-614372	0	15	699	14–15
AOC 21-028(d)					
RE21-11-10233	21-614373	0	62	466	1–2
RE21-11-10234	21-614373	0	62	466	5–6
RE21-11-10235	21-614373	0	0	466	10–11
RE21-11-10236	21-614374	0	31	699	1–2
RE21-11-10237	21-614374	0	15	699	5–6
RE21-11-10238	21-614374	0	0	466	10–11
RE21-11-10239	21-614375	0	15	699	1–2
RE21-11-10240	21-614375	0	46	466	5–6
RE21-11-10241	21-614375	0	15	699	10–11
RE21-11-10242	21-614376	0	0	699	1–2
RE21-11-10243	21-614376	0	0	699	5–6
RE21-11-10244	21-614376	0	0	466	10–11

Table 4.2-2 (continued)

Sample ID	Location ID	PID Reading (ppm)	Alpha Reading* (dpm)	Beta/Gamma Reading* (dpm)	Depth (ft)
RE21-11-10245	21-614377	0	93	699	1–2
RE21-11-10246	21-614377	0	31	699	5–6
RE21-11-10247	21-614377	0	15	466	10–11
RE21-11-10248	21-614378	0	62	560	1–2
RE21-11-10249	21-614378	0	46	1120	5–6
RE21-11-10250	21-614378	0	31	700	10–11

*Results reported represent site background levels.

Table 4.2-3
Coordinates of Piping and Structures Left in Place

Building/SWMU or Consolidated Unit	Existing Piping/ Structure Description	West Endpoint		East Endpoint	
		X Coordinate (ft)	Y Coordinate (ft)	X Coordinate (ft)	Y Coordinate (ft)
Consolidated Unit 21-004(b)-99	Sump 21-223 floor	1633752.76	1774256.17	n/a*	n/a
SWMU 21-011(b)	Line northwest of building 21-155	1633770.83	1774189.69	1633803.33	1774202.42
SWMU 21-011(b)	Corner of line northwest of building 21-155	1633775.10	1774208.88	n/a	n/a
SWMU 21-011(b)	Approximate 8-ft section of line east of MDA T	1633083.87	1774346.44	1633098.17	1774349.94
SWMU 21-011(b)	Manhole 21-222 floor and line north of building 21-152	1633850.68	1774219.67	n/a	n/a
SWMU 21-011(b)	Manhole 21-221 floor and line north of building 21-152	n/a	n/a	1633946.48	1774196.57
SWMU 21-011(b)	Diagonal line between manhole 21-221 and building 21-209	n/a	n/a	1633975.16	1774170.24
Building 21-155	Approximate 50-ft section of line between cooling towers 21-220 and 21-420	1633726.88	1774212.09	1633786.51	1774197.78
Building/SWMU or Consolidated Unit	**Existing Piping/ Structure Description**	**North Endpoint**		**South Endpoint**	
		X Coordinate (ft)	**Y Coordinate (ft)**	**X Coordinate (ft)**	**Y Coordinate (ft)**
Building 21-209	Piping in basement	1634045.45	1774155.66	1633983.82	1773889.39

*n/a = Not applicable.

Table 7.1-1
Samples Collected and Analyses Requested at Consolidated Unit 21-004(b)-99

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-Emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE21-11-9842	21-614319	7–8	SOIL	11-2269	11-2269	—*	11-2269	11-2269	—	11-2269	11-2269	11-2269	11-2269	—	11-2269	11-2269	11-2269	11-2269	11-2269	11-2269
RE21-11-9843	21-614319	9–10	SOIL	11-2269	11-2269	—	11-2269	11-2269	—	11-2269	11-2269	11-2269	11-2269	—	11-2269	11-2269	11-2269	11-2269	11-2269	11-2269
RE21-11-9846	21-614321	0–0.5	SOIL	11-2786	11-2785	—	11-2786	11-2786	—	11-2786	11-2786	11-2786	11-2785	—	11-2785	11-2786	11-2784	11-2786	—	11-2785
RE21-11-9847	21-614321	2–3	SOIL	11-2786	11-2785	—	11-2786	11-2786	—	11-2786	11-2786	11-2786	11-2785	—	11-2785	11-2786	11-2784	11-2786	11-2784	11-2785
RE21-11-9848	21-614322	0–1	SOIL	11-2805	11-2804	—	11-2805	11-2805	—	11-2805	11-2805	11-2805	11-2804	—	11-2804	11-2805	11-2802	11-2805	—	11-2804
RE21-11-9849	21-614322	2–3	QBT3	11-2805	11-2804	—	11-2805	11-2805	—	11-2805	11-2805	11-2805	11-2804	—	11-2804	11-2805	11-2802	11-2805	11-2802	11-2804
RE21-11-9850	21-614323	0–0.5	SOIL	11-2786	11-2785	—	11-2786	11-2786	—	11-2786	11-2786	11-2786	11-2785	—	11-2785	11-2786	11-2784	11-2786	—	11-2785
RE21-11-9851	21-614323	2–3	SOIL	11-2786	11-2785	—	11-2786	11-2786	—	11-2786	11-2786	11-2786	11-2785	—	11-2785	11-2786	11-2784	11-2786	11-2784	11-2785
RE21-11-9852	21-614324	0–1	SOIL	11-2805	11-2804	—	11-2805	11-2805	—	11-2805	11-2805	11-2805	11-2804	—	11-2804	11-2805	11-2802	11-2805	—	11-2804
RE21-11-9853	21-614324	2–3	QBT3	11-2805	11-2804	—	11-2805	11-2805	—	11-2805	11-2805	11-2805	11-2804	—	11-2804	11-2805	11-2802	11-2805	11-2802	11-2804
RE21-11-9854	21-614325	0–1	SOIL	11-2805	11-2804	—	11-2805	11-2805	—	11-2805	11-2805	11-2805	11-2804	—	11-2804	11-2805	11-2802	11-2805	—	11-2804
RE21-11-9855	21-614325	2–3	QBT3	11-2805	11-2804	—	11-2805	11-2805	—	11-2805	11-2805	11-2805	11-2804	—	11-2804	11-2805	11-2802	11-2805	11-2802	11-2804
RE21-11-9856	21-614326	0.5–1.5	SOIL	11-2820	11-2818	—	11-2820	11-2820	—	11-2820	11-2820	11-2820	11-2818	—	11-2818	11-2820	11-2817	11-2820	—	11-2818
RE21-11-9857	21-614326	2.5–3.5	QBT3	11-2820	11-2818	—	11-2820	11-2820	—	11-2820	11-2820	11-2820	11-2818	—	11-2818	11-2820	11-2817	11-2820	11-2817	11-2818
RE21-11-9872	21-614326	5–6	QBT3	11-2820	11-2818	—	11-2820	11-2820	—	11-2820	11-2820	11-2820	11-2818	11-2817	11-2818	11-2820	11-2817	11-2820	11-2817	11-2818
RE21-11-9858	21-614327	2–3	QBT3	11-2805	11-2804	—	11-2805	11-2805	—	11-2805	11-2805	11-2805	11-2804	—	11-2804	11-2805	11-2802	11-2805	11-2802	11-2804
RE21-11-9859	21-614327	4–5	QBT3	11-2805	11-2804	—	11-2805	11-2805	—	11-2805	11-2805	11-2805	11-2804	—	11-2804	11-2805	11-2802	11-2805	11-2802	11-2804
RE21-11-9860	21-614328	0–1	SOIL	11-2805	11-2804	11-2803	11-2805	11-2805	11-2802	11-2805	11-2805	11-2805	11-2804	11-2802	11-2804	11-2805	11-2802	11-2805	—	11-2804
RE21-11-9861	21-614328	2–3	SOIL	11-2805	11-2804	11-2803	11-2805	11-2805	11-2802	11-2805	11-2805	11-2805	11-2804	11-2802	11-2804	11-2805	11-2802	11-2805	11-2802	11-2804
RE21-11-9871	21-614328	5–6	QBT3	11-2805	11-2804	11-2803	11-2805	11-2805	11-2802	11-2805	11-2805	11-2805	11-2804	11-2802	11-2804	11-2805	11-2802	11-2805	11-2802	11-2804
RE21-11-9862	21-614329	0.5–1.5	SOIL	11-2805	11-2804	11-2803	11-2805	11-2805	11-2802	11-2805	11-2805	11-2805	11-2804	11-2802	11-2804	11-2805	11-2802	11-2805	—	11-2804
RE21-11-9863	21-614329	2.5–3.5	QBT3	11-2805	11-2804	11-2803	11-2805	11-2805	11-2802	11-2805	11-2805	11-2805	11-2804	11-2802	11-2804	11-2805	11-2802	11-2805	11-2802	11-2804
RE21-11-9864	21-614329	5-6	QBT3	11-2820	11-2818	11-2819	11-2820	11-2820	11-2817	11-2820	11-2820	11-2820	11-2818	11-2817	11-2818	11-2820	11-2817	11-2820	11-2817	11-2818

*— = Analysis not requested.

Table 7.1-2
Inorganic Chemicals above BVs at Consolidated Unit 21-004(b)-99

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Barium	Cadmium	Calcium	Chromium	Copper	Iron	Lead	Magnesium	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Zinc
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**46**	**1.63**	**2200**	**7.14**	**4.66**	**14500**	**11.2**	**1690**	**0.1**	**6.58**	**na[b]**	**na**	**0.3**	**1**	**63.5**
Soil BV[a]				**29200**	**0.83**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**21500**	**22.3**	**4610**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**48.8**
Construction Worker SSL[c]				**40700**	**124**	**4350**	**309**	**na**	**449[d]**	**12400**	**217000**	**800**	**na**	**92.9[e]**	**6190**	**496000**	**217**	**1550**	**1550**	**92900**
Industrial SSL[c]				**1130000**	**454**	**224000**	**1120**	**na**	**2920[d]**	**45400**	**795000**	**800**	**na**	**310[f]**	**22700**	**1820000**	**795**	**5680**	**5680**	**341000**
Residential SSL[c]				**78100**	**31.3**	**15600**	**77.9**	**na**	**219[d]**	**3130**	**54800**	**400**	**na**	**23[f]**	**1560**	**125000**	**54.8**	**391**	**391**	**23500**
RE21-11-9842	21-614319	7–8	SOIL	—[g]	0.955 (U)	—	0.478 (U)	—	—	—	—	—	—	0.118	—	1.38	0.000709 (J)	—	—	—
RE21-11-9843	21-614319	9–10	SOIL	—	1.04 (U)	—	0.519 (U)	—	—	—	—	—	—	—	—	1.6	0.0007 (J)	—	—	49.3
RE21-11-9846	21-614321	0–0.5	SOIL	—	1.02 (U)	—	0.508 (U)	—	—	—	—	—	—	0.767 (J-)	—	1.69	0.00142 (J)	—	1.65	49.4
RE21-11-9847	21-614321	2–3	SOIL	—	0.996 (U)	—	0.498 (U)	—	—	—	—	—	—	0.574 (J-)	—	1.68	0.00131 (J)	—	1.37	—
RE21-11-9848	21-614322	0–1	SOIL	—	0.983 (U)	—	0.492 (U)	—	—	—	—	—	—	—	—	—	—	—	1.55	—
RE21-11-9849	21-614322	2–3	QBT3	—	1.01 (U)	54	—	—	—	—	—	—	—	—	—	—	—	1 (U)	1.65	—
RE21-11-9850	21-614323	0–0.5	SOIL	—	1.02 (U)	—	0.512 (U)	—	—	—	—	—	—	0.111 (J-)	—	—	0.00217	—	—	—
RE21-11-9851	21-614323	2–3	SOIL	—	0.984 (U)	—	0.492 (U)	—	—	—	—	—	—	—	—	—	0.000952 (J)	—	—	—
RE21-11-9852	21-614324	0–1	SOIL	—	0.975 (U)	—	0.487 (U)	—	—	—	—	—	—	—	—	—	—	—	1.7	—
RE21-11-9853	21-614324	2–3	QBT3	—	0.958 (U)	57.8	—	—	—	—	—	—	—	—	—	—	—	1.02 (U)	1.7	—
RE21-11-9854	21-614325	0–1	SOIL	—	1.01 (U)	—	0.503 (U)	—	—	—	—	—	—	—	—	—	—	—	1.29	—
RE21-11-9855	21-614325	2–3	QBT3	—	0.978 (U)	107	—	4090 (U)	—	4.75 (U)	—	12.1	—	—	—	—	—	1.04 (U)	1.7	—
RE21-11-9856	21-614326	0.5–1.5	SOIL	—	0.978 (U)	—	0.489 (U)	16200 (J+)	—	—	—	—	—	—	—	—	—	—	—	—
RE21-11-9857	21-614326	2.5–3.5	QBT3	—	0.62 (J)	—	—	—	43.1	10.5 (U)	—	—	—	—	12.9	—	—	1 (U)	—	—
RE21-11-9872	21-614326	5–6	QBT3	—	0.751 (J)	—	—	—	51.8	13 (U)	—	—	—	—	13	—	—	1.01 (U)	—	—
RE21-11-9858	21-614327	2–3	QBT3	—	1.07 (U)	73.3	—	2440 (U)	—	—	—	11.4	—	—	—	—	—	1.06 (U)	1.91	—
RE21-11-9859	21-614327	4–5	QBT3	—	1.02 (U)	—	—	—	8.97	—	—	—	—	—	—	—	—	0.935 (U)	—	—
RE21-11-9860	21-614328	0–1	SOIL	—	1.11 (U)	—	0.557 (U)	—	—	—	—	—	—	0.121 (J-)	—	—	—	—	3.28	—
RE21-11-9861	21-614328	2–3	SOIL	—	1.09 (U)	—	0.545 (U)	10600 (U)	—	—	—	—	—	—	—	—	—	—	2.51	—
RE21-11-9871	21-614328	5–6	QBT3	7380	0.971 (U)	79.6	—	3570 (U)	112	20.5 (U)	17600	—	2520 (U)	—	22.9	—	—	1.01 (U)	2.53	—
RE21-11-9862	21-614329	0.5–1.5	SOIL	—	1 (U)	—	0.501 (U)	—	—	—	—	—	—	—	—	—	—	—	1.17	—
RE21-11-9863	21-614329	2.5–3.5	QBT3	—	0.971 (U)	—	—	—	40.8	7.19 (U)	—	—	—	—	7.5	—	—	0.96 (U)	1.07	—
RE21-11-9864	21-614329	5–6	QBT3	—	—	—	—	—	37.4	5.57 (U)	—	—	—	—	7.84	—	—	0.979 (U)	—	—

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

[a] BVs are from LANL (1998, 059730).

[b] na = Not available.

[c] SSLs are from NMED (2009, 108070) unless otherwise noted.

[d] SSLs are for hexavalent chromium.

[e] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov.earth1r6/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2009, 108070).

[f] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[g] — = Not detected or not detected above BV.

Table 7.1-3
Organic Chemicals Detected at Consolidated Unit 21-004(b)-99

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Butanone[2-]	Chrysene
Construction Worker SSL[a]				**18600**	**263000**	**66800**	**4.36**	**75.8**	**213**	**21.3**	**213**	**6680[b]**	**2060**	**148000**	**20600**
Industrial SSL[a]				**36700**	**851000**	**183000**	**8.26**	**8.26**	**23.4**	**2.34**	**23.4**	**18300[b]**	**234**	**369000**	**2340**
Residential SSL[a]				**3440**	**67500**	**17200**	**1.12**	**2.22**	**6.21**	**0.621**	**6.21**	**1720[b]**	**62.1**	**39600**	**621**
RE21-11-9843	21-614319	9–10	SOIL	—[c]	—	—	NA[d]	NA	0.0157 (J)	0.0161 (J)	0.0154 (J)	—	—	—	0.0136 (J)
RE21-11-9847	21-614321	2–3	SOIL	—	0.00572	—	NA	NA	—	—	—	—	—	—	—
RE21-11-9848	21-614322	0–1	SOIL	—	NA	—	NA	NA	0.0259 (J)	0.0289 (J)	0.0262 (J)	—	—	NA	0.0232 (J)
RE21-11-9849	21-614322	2–3	QBT3	—	—	—	NA	NA	—	—	—	—	—	—	—
RE21-11-9850	21-614323	0–0.5	SOIL	—	NA	—	NA	NA	—	—	—	—	—	NA	—
RE21-11-9852	21-614324	0–1	SOIL	0.0385	NA	0.0656	NA	NA	0.204	0.167	0.228	0.0722	0.101	NA	0.179
RE21-11-9853	21-614324	2–3	QBT3	—	—	0.0107 (J)	NA	NA	0.0365	0.0283 (J)	0.0345	—	0.0183 (J)	—	0.0296 (J)
RE21-11-9854	21-614325	0–1	SOIL	0.0225 (J)	NA	0.0391	NA	NA	0.0902	0.0854	0.0997	0.0368	0.0517	NA	0.08
RE21-11-9855	21-614325	2–3	QBT3	—	0.00506 (J)	0.0125 (J)	NA	NA	0.0859	0.0783	0.103	0.0482	0.0409	—	0.0787
RE21-11-9856	21-614326	0.5–1.5	SOIL	—	NA	—	NA	NA	—	—	—	—	—	NA	—
RE21-11-9857	21-614326	2.5–3.5	QBT3	—	—	—	NA	NA	—	—	—	—	—	—	—
RE21-11-9872	21-614326	5–6	QBT3	—	—	—	0.0459	0.0208	—	—	—	—	—	—	—
RE21-11-9860	21-614328	0–1	SOIL	—	NA	—	—	—	—	—	—	—	—	NA	—
RE21-11-9861	21-614328	2–3	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE21-11-9871	21-614328	5–6	QBT3	—	0.0441 (J)	—	0.0069	0.0057	0.0128 (J)	—	—	—	—	0.00487 (J)	—
RE21-11-9862	21-614329	0.5–1.5	SOIL	—	NA	—	—	—	—	—	—	—	—	NA	—
RE21-11-9863	21-614329	2.5–3.5	QBT3	—	0.0046 (J)	—	—	—	—	—	—	—	—	—	—
RE21-11-9864	21-614329	5–6	QBT3	—	0.0118	—	0.0015 (J)	—	—	—	—	—	—	—	—

Table 7.1-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenz(a,h)anthracene	Diethylphthalate	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene
Construction Worker SSL[a]				**21.3**	**191000**	**8910**	**8910**	**na**[e]	**na**	**na**	**na**	**na**	**na**	**na**	**213**
Industrial SSL[a]				**2.34**	**547000**	**24400**	**24400**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**23.4**
Residential SSL[a]				**0.621**	**48900**	**2290**	**2290**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**6.21**
RE21-11-9843	21-614319	9–10	SOIL	—	—	0.0147 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-9847	21-614321	2–3	SOIL	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	—
RE21-11-9848	21-614322	0–1	SOIL	—	—	0.0535	—	NA	NA	NA	NA	NA	NA	NA	—
RE21-11-9849	21-614322	2–3	QBT3	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	—
RE21-11-9850	21-614323	0–0.5	SOIL	—	—	0.0163 (J)	—	NA	NA	NA	NA	NA	NA	NA	—
RE21-11-9852	21-614324	0–1	SOIL	0.0254 (J)	—	0.437	0.0299 (J)	NA	NA	NA	NA	NA	NA	NA	0.0825
RE21-11-9853	21-614324	2–3	QBT3	—	—	0.0713	—	NA	NA	NA	NA	NA	NA	NA	—
RE21-11-9854	21-614325	0–1	SOIL	—	—	0.201	0.018 (J)	NA	NA	NA	NA	NA	NA	NA	0.0425
RE21-11-9855	21-614325	2–3	QBT3	—	—	0.159	—	NA	NA	NA	NA	NA	NA	NA	0.0416
RE21-11-9856	21-614326	0.5–1.5	SOIL	—	0.136 (J)	—	—	NA	NA	NA	NA	NA	NA	NA	—
RE21-11-9857	21-614326	2.5–3.5	QBT3	—	0.142 (J)	—	—	NA	NA	NA	NA	NA	NA	NA	—
RE21-11-9872	21-614326	5–6	QBT3	—	0.145 (J)	—	—	NA	NA	NA	NA	NA	NA	NA	—
RE21-11-9860	21-614328	0–1	SOIL	—	—	—	—	0.00000947	0.0000178	0.00000213 (J)	0.00000524	0.000000506 (J)	0.00000262 (J)	0.00000222 (J)	—
RE21-11-9861	21-614328	2–3	SOIL	—	—	—	—	0.00000123 (J)	0.00000223 (J)	—	—	—	—	—	—
RE21-11-9871	21-614328	5–6	QBT3	—	—	0.0184 (J)	—	0.00000305 (J)	0.00000662	0.00000233 (J)	0.00000455 (J)	—	0.00000158 (J)	0.00000212 (J)	—
RE21-11-9862	21-614329	0.5–1.5	SOIL	—	—	—	—	0.000000957 (J)	0.00000192 (J)	—	—	—	0.000000799 (J)	—	—
RE21-11-9863	21-614329	2.5–3.5	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE21-11-9864	21-614329	5–6	QBT3	—	0.103 (J)	—	—	—	—	—	—	—	—	—	—

Table 7.1-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Isopropyltoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Propylbenzene[1-]	Pyrene	Tetrachlorodibenzofurans (Totals)	Tetrachloroethene	Toluene	Xylene[1,3-]+Xylene[1,4-]
Construction Worker SSL[a]				**10300[f]**	**na**	**na**	**na**	**7150**	**20100[g]**	**6680**	**na**	**338**	**21100**	**3130[h]**
Industrial SSL[a]				**14900[f]**	**na**	**na**	**na**	**20500**	**21000[i]**	**18300**	**na**	**36.4**	**57900**	**3610[h]**
Residential SSL[a]				**3210[f]**	**na**	**na**	**na**	**1830**	**3400[i]**	**1720**	**na**	**6.99**	**5570**	**1090[h]**
RE21-11-9843	21-614319	9–10	SOIL	—	NA	NA	NA	—	—	0.0185 (J)	NA	—	—	—
RE21-11-9847	21-614321	2–3	SOIL	—	NA	NA	NA	—	—	—	NA	0.000399 (J)	0.000388 (J)	—
RE21-11-9848	21-614322	0–1	SOIL	NA	NA	NA	NA	0.034	NA	0.0664	NA	NA	NA	NA
RE21-11-9849	21-614322	2–3	QBT3	0.00293	NA	NA	NA	—	—	—	NA	—	—	—
RE21-11-9850	21-614323	0–0.5	SOIL	NA	NA	NA	NA	—	NA	0.0159 (J)	NA	NA	NA	NA
RE21-11-9852	21-614324	0–1	SOIL	NA	NA	NA	NA	0.283	NA	0.375	NA	NA	NA	NA
RE21-11-9853	21-614324	2–3	QBT3	—	NA	NA	NA	0.0427	—	0.0641	NA	—	—	—
RE21-11-9854	21-614325	0–1	SOIL	NA	NA	NA	NA	0.154	NA	0.191	NA	NA	NA	NA
RE21-11-9855	21-614325	2–3	QBT3	0.0102	NA	NA	NA	0.0513	—	0.157	NA	—	—	—
RE21-11-9856	21-614326	0.5–1.5	SOIL	NA	NA	NA	NA	—	NA	—	NA	NA	NA	NA
RE21-11-9857	21-614326	2.5–3.5	QBT3	—	NA	NA	NA	—	—	—	NA	—	—	—
RE21-11-9872	21-614326	5–6	QBT3	—	NA	NA	NA	—	—	—	NA	—	—	—
RE21-11-9860	21-614328	0–1	SOIL	NA	0.0000933	0.00000415 (J)	0.00000301 (J)	—	NA	—	0.00000377 (J)	NA	NA	NA
RE21-11-9861	21-614328	2–3	SOIL	0.000894 (J)	0.0000108	—	—	—	—	—	0.000000484 (J)	—	—	—
RE21-11-9871	21-614328	5–6	QBT3	0.0169	0.0000268	0.0000019 (J)	0.00000219 (J)	0.0135 (J)	0.000331 (J)	0.0174 (J)	0.00000124 (J)	0.000896 (J)	0.000992 (J)	0.000352 (J)
RE21-11-9862	21-614329	0.5–1.5	SOIL	NA	0.00000613 (J)	—	0.000000533 (J)	—	NA	—	0.000000436 (J)	NA	NA	NA
RE21-11-9863	21-614329	2.5–3.5	QBT3	0.00117	—	—	—	—	—	—	0.000000366 (J)	—	—	—
RE21-11-9864	21-614329	5–6	QBT3	—	—	—	—	—	—	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.
[a] SSLs are from NMED (2009, 108070) unless otherwise noted.
[b] Pyrene SSL used as surrogate based on structural similarity.
[c] — = Not detected.
[d] NA = Not analyzed.
[e] na = Not available.
[f] Isopropylbenzene SSL used as surrogate based on structural similarity.
[g] Construction Worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2009, 108070).
[h] Xylene SSL used as surrogate based on structural similarity.
[i] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table 7.1-4
Radionuclides Detected or Detected above BVs/FVs at Consolidated Unit 21-004(b)-99

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-239/240	Tritium	Uranium-235/236
Qbt 2, 3, 4 BV/FV[a]				**na[b]**	**na**	**na**	**na**	**0.09**
Soil BV/FV[a]				**0.013**	**1.65**	**0.054**	**na**	**0.2**
Construction Worker SAL[c]				**34**	**18**	**36**	**320000**	**43**
Industrial SAL[c]				**180**	**23**	**210**	**440000**	**87**
Residential SAL[c]				**30**	**5.6**	**33**	**750**	**17**
RE21-11-9842	21-614319	7–8	SOIL	—[d]	—	0.121	7.62872	—
RE21-11-9843	21-614319	9–10	SOIL	—	—	0.566	3.63153	—
RE21-11-9846	21-614321	0–0.5	SOIL	0.0658	—	1.87	1.89204	—
RE21-11-9847	21-614321	2–3	SOIL	0.0902	—	1.46	3.01511	—
RE21-11-9848	21-614322	0–1	SOIL	0.0401	—	0.209	0.286019	—
RE21-11-9849	21-614322	2–3	QBT3	—	—	0.0906	0.209834	—
RE21-11-9850	21-614323	0–0.5	SOIL	0.0916	—	1.76	0.865889	—
RE21-11-9851	21-614323	2–3	SOIL	—	—	—	3.53961	—
RE21-11-9852	21-614324	0–1	SOIL	0.112	—	0.393	0.24575	—
E21-11-9853	21-614324	2–3	QBT3	0.0213	—	0.203	0.570134	—
RE21-11-9854	21-614325	0–1	SOIL	0.0263	—	0.191	0.171885	—
RE21-11-9855	21-614325	2–3	QBT3	—	—	0.243	0.299922	—
RE21-11-9856	21-614326	0.5–1.5	SOIL	—	0.0376	0.0625	0.0151254	—
RE21-11-9857	21-614326	2.5–3.5	QBT3	—	—	—	0.02196	—
RE21-11-9872	21-614326	5–6	QBT3	—	—	—	0.126857	—
RE21-11-9858	21-614327	2–3	QBT3	—	—	—	2.09301	0.0923
RE21-11-9859	21-614327	4–5	QBT3	—	—	—	0.869269	—
RE21-11-9860	21-614328	0–1	SOIL	—	—	0.0977	1.63811	—
RE21-11-9861	21-614328	2–3	SOIL	—	—	—	8.10298	—
RE21-11-9871	21-614328	5–6	QBT3	0.0257	—	0.0764	9.02026	—
RE21-11-9862	21-614329	0.5–1.5	SOIL	—	—	0.0544	0.00776377	—
RE21-11-9863	21-614329	2.5–3.5	QBT3	—	—	—	0.0236838	—
RE21-11-9864	21-614329	5–6	QBT3	—	—	—	0.0264803	—

Note: Results are in pCi/g.
[a] BVs/FVs are from LANL (1998, 059730).
[b] na = Not available.
[c] SALs are from LANL (2009, 107655).
[d] — = Not detected or not detected above BV/FV.

Table 7.1-5
Samples Collected and Analyses Requested at SWMU 21-011(b)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-Emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE21-11-3822	21-613813	4–5	SOIL	11-1819	11-1818	—*	11-1819	11-1819	—	11-1819	11-1819	11-1819	11-1818	—	11-1818	11-1819	11-1816	11-1819	11-1816	11-1818
RE21-11-3823	21-613813	6–7	QBT3	11-1819	11-1818	—	11-1819	11-1819	—	11-1819	11-1819	11-1819	11-1818	—	11-1818	11-1819	11-1816	11-1819	11-1816	11-1818
RE21-11-3824	21-613814	6–7	SOIL	11-1819	11-1818	—	11-1819	11-1819	—	11-1819	11-1819	11-1819	11-1818	—	11-1818	11-1819	11-1816	11-1819	11-1816	11-1818
RE21-11-3825	21-613814	8–9	SOIL	11-1819	11-1818	—	11-1819	11-1819	—	11-1819	11-1819	11-1819	11-1818	—	11-1818	11-1819	11-1816	11-1819	11-1816	11-1818
RE21-11-3826	21-613815	7–8	SOIL	11-2270	11-2270	—	11-2270	11-2270	—	11-2270	11-2270	11-2270	11-2270	—	11-2270	11-2270	11-2270	11-2270	11-2270	11-2270
RE21-11-3827	21-613815	9–10	QBT3	11-2270	11-2270	—	11-2270	11-2270	—	11-2270	11-2270	11-2270	11-2270	—	11-2270	11-2270	11-2270	11-2270	11-2270	11-2270
RE21-11-3828	21-613816	7–8	SOIL	11-2535	11-2534	—	11-2535	11-2535	—	11-2535	11-2535	11-2535	11-2534	—	11-2534	11-2535	11-2533	11-2535	11-2533	11-2534
RE21-11-3829	21-613816	9–10	QBT3	11-2535	11-2534	—	11-2535	11-2535	—	11-2535	11-2535	11-2535	11-2534	—	11-2534	11-2535	11-2533	11-2535	11-2533	11-2534
RE21-11-3832	21-613818	6–7	QBT3	11-1701	11-1700	—	11-1701	11-1701	—	11-1701	11-1701	11-1701	11-1700	—	11-1700	11-1701	11-1699	11-1701	11-1699	11-1700
RE21-11-3833	21-613818	8–9	QBT3	11-1701	11-1700	—	11-1701	11-1701	—	11-1701	11-1701	11-1701	11-1700	—	11-1700	11-1701	11-1699	11-1701	11-1699	11-1700
RE21-11-3834	21-613819	5–6	QBT3	11-1701	11-1700	—	11-1701	11-1701	—	11-1701	11-1701	11-1701	11-1700	—	11-1700	11-1701	11-1699	11-1701	11-1699	11-1700
RE21-11-3835	21-613819	7–8	QBT3	11-1701	11-1700	—	11-1701	11-1701	—	11-1701	11-1701	11-1701	11-1700	—	11-1700	11-1701	11-1699	11-1701	11-1699	11-1700
RE21-11-3836	21-613820	4–5	QBT3	11-1701	11-1700	—	11-1701	11-1701	—	11-1701	11-1701	11-1701	11-1700	—	11-1700	11-1701	11-1699	11-1701	11-1699	11-1700
RE21-11-3837	21-613820	6–7	QBT3	11-1701	11-2410	—	11-1701	11-1701	—	11-1701	11-1701	11-1701	11-2410	—	11-2410	11-1701	11-1699	11-1701	11-1699	11-2410
RE21-11-3838	21-613821	4–5	QBT3	11-1741	11-1739	—	11-1741	11-1741	—	11-1741	11-1741	11-1741	11-1739	—	11-1739	11-1741	11-1740	11-1741	11-1740	11-1739
RE21-11-3839	21-613821	6–7	QBT3	11-1741	11-1739	—	11-1741	11-1741	—	11-1741	11-1741	11-1741	11-1739	—	11-1739	11-1741	11-1740	11-1741	11-1740	11-1739
RE21-11-3840	21-613822	4–5	QBT3	11-1741	11-1739	—	11-1741	11-1741	—	11-1741	11-1741	11-1741	11-1739	—	11-1739	11-1741	11-1740	11-1741	11-1740	11-1739
RE21-11-3841	21-613822	6–7	QBT3	11-1741	11-1739	—	11-1741	11-1741	—	11-1741	11-1741	11-1741	11-1739	—	11-1739	11-1741	11-1740	11-1741	11-1740	11-1739
RE21-11-3842	21-613823	4–5	QBT3	11-1741	11-1739	—	11-1741	11-1741	—	11-1741	11-1741	11-1741	11-1739	—	11-1739	11-1741	11-1740	11-1741	11-1740	11-1739
RE21-11-3843	21-613823	6–7	QBT3	11-1741	11-1739	—	11-1741	11-1741	—	11-1741	11-1741	11-1741	11-1739	—	11-1739	11-1741	11-1740	11-1741	11-1740	11-1739
RE21-11-3844	21-613824	4–5	SOIL	11-1741	11-1739	—	11-1741	11-1741	—	11-1741	11-1741	11-1741	11-1739	—	11-1739	11-1741	11-1740	11-1741	11-1740	11-1739
RE21-11-3845	21-613824	6–7	QBT3	11-1741	11-1739	—	11-1741	11-1741	—	11-1741	11-1741	11-1741	11-1739	—	11-1739	11-1741	11-1740	11-1741	11-1740	11-1739
RE21-11-3846	21-613825	4–5	QBT3	11-1741	11-1739	—	11-1741	11-1741	—	11-1741	11-1741	11-1741	11-1739	—	11-1739	11-1741	11-1740	11-1741	11-1740	11-1739
RE21-11-3847	21-613825	6–7	QBT3	11-1741	11-1739	—	11-1741	11-1741	—	11-1741	11-1741	11-1741	11-1739	—	11-1739	11-1741	11-1740	11-1741	11-1740	11-1739
RE21-11-3848	21-613826	4–5	SOIL	11-1741	11-1739	—	11-1741	11-1741	—	11-1741	11-1741	11-1741	11-1739	—	11-1739	11-1741	11-1740	11-1741	11-1740	11-1739
RE21-11-3849	21-613826	6–7	QBT3	11-1741	11-1739	—	11-1741	11-1741	—	11-1741	11-1741	11-1741	11-1739	—	11-1739	11-1741	11-1740	11-1741	11-1740	11-1739
RE21-11-3850	21-613827	4–5	SOIL	11-1741	11-1739	—	11-1741	11-1741	—	11-1741	11-1741	11-1741	11-1739	—	11-1739	11-1741	11-1740	11-1741	11-1740	11-1739
RE21-11-3851	21-613827	6–7	SOIL	11-1741	11-1739	—	11-1741	11-1741	—	11-1741	11-1741	11-1741	11-1739	—	11-1739	11-1741	11-1740	11-1741	11-1740	11-1739
RE21-11-3852	21-613828	5–6	SOIL	11-1915	11-1914	—	11-1915	11-1915	—	11-1915	—	11-1915	11-1914	—	11-1914	11-1915	11-1913	11-1915	11-1913	11-1914
RE21-11-3853	21-613828	7–8	SOIL	11-1915	11-1914	—	11-1915	11-1915	—	11-1915	—	11-1915	11-1914	—	11-1914	11-1915	11-1913	11-1915	11-1913	11-1914
RE21-11-3854	21-613829	5–6	SOIL	11-1915	11-1914	—	11-1915	11-1915	—	11-1915	—	11-1915	11-1914	—	11-1914	11-1915	11-1913	11-1915	11-1913	11-1914
RE21-11-3855	21-613829	7–8	QBT3	11-1915	11-1914	—	11-1915	11-1915	—	11-1915	—	11-1915	11-1914	—	11-1914	11-1915	11-1913	11-1915	11-1913	11-1914

Table 7.1-5 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-Emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE21-11-3864	21-613834	1–2	SOIL	11-2445	11-2444	—	11-2445	11-2445	—	11-2445	11-2445	11-2445	11-2444	—	11-2444	11-2445	11-2443	11-2445	11-2443	11-2444
RE21-11-3865	21-613834	3–4	QBT3	11-2445	11-2444	—	11-2445	11-2445	—	11-2445	11-2445	11-2445	11-2444	—	11-2444	11-2445	11-2443	11-2445	11-2443	11-2444
RE21-11-3866	21-613835	2–3	QBT3	11-2445	11-2444	—	11-2445	11-2445	—	11-2445	11-2445	11-2445	11-2444	—	11-2444	11-2445	11-2443	11-2445	11-2443	11-2444
RE21-11-3867	21-613835	3–4	SOIL	11-2445	11-2444	—	11-2445	11-2445	—	11-2445	11-2445	11-2445	11-2444	—	11-2444	11-2445	11-2443	11-2445	11-2443	11-2444
RE21-11-3868	21-613836	10–11	QBT3	11-2463	11-2462	—	11-2463	11-2463	—	11-2463	11-2463	11-2463	11-2462	—	11-2462	11-2463	11-2461	11-2463	11-2461	11-2462
RE21-11-3869	21-613836	12–13	QBT3	11-2463	11-2462	—	11-2463	11-2463	—	11-2463	11-2463	11-2463	11-2462	—	11-2462	11-2463	11-2461	11-2463	11-2461	11-2462
RE21-11-3870	21-613837	10–11	QBT3	11-2463	11-2462	—	11-2463	11-2463	—	11-2463	11-2463	11-2463	11-2462	—	11-2462	11-2463	11-2461	11-2463	11-2461	11-2462
RE21-11-3871	21-613837	12–13	QBT3	11-2463	11-2462	—	11-2463	11-2463	—	11-2463	11-2463	11-2463	11-2462	—	11-2462	11-2463	11-2461	11-2463	11-2461	11-2462
RE21-11-3872	21-613838	7–8	SOIL	11-2535	11-2534	—	11-2535	11-2535	—	11-2535	11-2535	11-2535	11-2534	—	11-2534	11-2535	11-2533	11-2535	11-2533	11-2534
RE21-11-3873	21-613838	9–10	SOIL	11-2535	11-2534	—	11-2535	11-2535	—	11-2535	11-2535	11-2535	11-2534	—	11-2534	11-2535	11-2533	11-2535	11-2533	11-2534
RE21-11-3874	21-613839	5–6	SOIL	11-2556	11-2555	—	11-2556	11-2556	—	11-2556	11-2556	11-2556	11-2555	—	11-2555	11-2556	11-2554	11-2556	11-2554	11-2555
RE21-11-3875	21-613839	7–8	SOIL	11-2556	11-2555	—	11-2556	11-2556	—	11-2556	11-2556	11-2556	11-2555	—	11-2555	11-2556	11-2554	11-2556	11-2554	11-2555
RE21-11-3890	21-613847	6–7	SOIL	11-1819	11-1818	11-1817	11-1819	11-1819	11-1816	11-1819	11-1819	11-1819	11-1818	11-1816	11-1818	11-1819	11-1816	11-1819	11-1816	11-1818
RE21-11-3891	21-613847	8–9	SOIL	11-1819	11-1818	11-1817	11-1819	11-1819	11-1816	11-1819	11-1819	11-1819	11-1818	11-1816	11-1818	11-1819	11-1816	11-1819	11-1816	11-1818
RE21-11-3892	21-613848	10–11	QBT3	11-2463	11-2462	11-2460	11-2463	11-2463	11-2461	11-2463	11-2463	11-2463	11-2462	11-2461	11-2462	11-2463	11-2461	11-2463	11-2461	11-2462
RE21-11-3893	21-613848	12–13	QBT3	11-2463	11-2462	11-2460	11-2463	11-2463	11-2461	11-2463	11-2463	11-2463	11-2462	11-2461	11-2462	11-2463	11-2461	11-2463	11-2461	11-2462
RE21-11-3894	21-613849	2–3	SOIL	11-2463	11-2462	11-2460	11-2463	11-2463	11-2461	11-2463	11-2463	11-2463	11-2462	11-2461	11-2462	11-2463	11-2461	11-2463	11-2461	11-2462
RE21-11-3895	21-613849	4–5	SOIL	11-2463	11-2462	11-2460	11-2463	11-2463	11-2461	11-2463	11-2463	11-2463	11-2462	11-2461	11-2462	11-2463	11-2461	11-2463	11-2461	11-2462

*— = Analysis not requested.

Table 7.1-6
Inorganic Chemicals above BVs at SWMU 21-011(b)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**
Soil BV[a]				**29200**	**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**
Construction Worker SSL[b]				**40700**	**124**	**4350**	**144**	**309**	**na**[c]	**449**[d]	**34.6**[e]	**12400**	**6190**
Industrial SSL[b]				**1130000**	**454**	**224000**	**2260**	**1120**	**na**	**2920**[d]	**300**[f]	**45400**	**22700**
Residential SSL[b]				**78100**	**31.3**	**15600**	**156**	**77.9**	**na**	**219**[d]	**23**[f]	**3130**	**1560**
RE21-11-3822	21-613813	4–5	SOIL	—[g]	0.966 (U)	—	—	0.483 (U)	—	—	—	—	—
RE21-11-3823	21-613813	6–7	QBT3	—	0.947 (U)	—	—	—	2400 (U)	10.9	—	—	—
RE21-11-3824	21-613814	6–7	SOIL	—	0.988 (U)	—	—	0.494 (U)	—	—	—	—	—
RE21-11-3825	21-613814	8–9	SOIL	—	1.1 (U)	—	—	0.551 (U)	—	—	—	—	—
RE21-11-3826	21-613815	7–8	SOIL	—	1.05 (U)	—	—	0.524 (U)	—	—	—	—	—
RE21-11-3827	21-613815	9–10	QBT3	—	0.989 (U)	—	—	—	—	—	—	—	—
RE21-11-3828	21-613816	7–8	SOIL	—	1.18 (U)	—	1.9	0.588 (U)	—	—	—	—	2.04
RE21-11-3829	21-613816	9–10	QBT3	—	1.16 (U)	65.9 (J-)	—	—	2900	12.9	—	5.65	—
RE21-11-3832	21-613818	6–7	QBT3	—	0.679 (U)	48.8 (J+)	—	—	—	—	—	—	—
RE21-11-3833	21-613818	8–9	QBT3	—	0.955 (U)	—	—	—	—	—	—	—	—
RE21-11-3834	21-613819	5–6	QBT3	—	0.94 (U)	81.5 (J+)	—	—	2460 (J+)	—	—	—	—
RE21-11-3835	21-613819	7–8	QBT3	—	1.01 (U)	—	—	—	—	10.2	—	—	—
RE21-11-3836	21-613820	4–5	QBT3	—	0.909 (U)	48.4 (J+)	—	—	—	—	—	—	—
RE21-11-3837	21-613820	6–7	QBT3	—	1.03 (U)	—	—	—	—	8.79	—	—	—
RE21-11-3838	21-613821	4–5	QBT3	8470	0.524 (U)	101	—	—	2220	—	—	5.59	—
RE21-11-3839	21-613821	6–7	QBT3	—	1.13 (U)	75.7	—	—	2480	—	—	5.02	—
RE21-11-3840	21-613822	4–5	QBT3	—	1.06 (U)	—	—	—	—	—	—	—	—
RE21-11-3841	21-613822	6–7	QBT3	—	1.05 (U)	—	—	—	—	—	—	—	—
RE21-11-3842	21-613823	4–5	QBT3	—	1.09 (U)	68	—	—	—	—	—	—	—
RE21-11-3843	21-613823	6–7	QBT3	—	0.996 (U)	—	—	—	—	—	—	—	—
RE21-11-3844	21-613824	4–5	SOIL	—	—	—	—	0.533 (U)	—	—	—	—	—
RE21-11-3845	21-613824	6–7	QBT3	—	0.998 (U)	—	—	—	—	—	—	—	—
RE21-11-3846	21-613825	4–5	QBT3	—	—	74.2	—	—	2250	—	—	—	—
RE21-11-3847	21-613825	6–7	QBT3	—	1.02 (U)	56.3	—	—	3120	—	—	—	—
RE21-11-3848	21-613826	4–5	SOIL	—	1.03 (U)	—	—	—	—	—	—	—	—
RE21-11-3849	21-613826	6–7	QBT3	8410	1.06 (U)	56.6	1.23	—	—	—	—	4.85	—
RE21-11-3850	21-613827	4–5	SOIL	—	—	—	—	—	10600	—	—	—	—

Table 7.1-6 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**
Soil BV[a]				**29200**	**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**
Construction Worker SSL[b]				**40700**	**124**	**4350**	**144**	**309**	**na[c]**	**449[d]**	**34.6[e]**	**12400**	**6190**
Industrial SSL[b]				**1130000**	**454**	**224000**	**2260**	**1120**	**na**	**2920[d]**	**300[f]**	**45400**	**22700**
Residential SSL[b]				**78100**	**31.3**	**15600**	**156**	**77.9**	**na**	**219[d]**	**23[f]**	**3130**	**1560**
RE21-11-3851	21-613827	6–7	SOIL	—	1.05 (U)	—	—	0.524 (U)	—	—	—	—	—
RE21-11-3852	21-613828	5–6	SOIL	—	—	—	—	0.513 (U)	—	—	—	—	—
RE21-11-3853	21-613828	7–8	SOIL	—	1.13 (U)	—	—	0.564 (U)	—	—	—	—	—
RE21-11-3854	21-613829	5–6	SOIL	—	1.06 (U)	—	—	0.529 (U)	—	—	—	—	—
RE21-11-3855	21-613829	7–8	QBT3	—	1.01 (U)	—	—	—	—	—	—	—	—
RE21-11-3864	21-613834	1–2	SOIL	—	0.994 (UJ)	—	—	0.497 (U)	8610	—	—	23.2	—
RE21-11-3865	21-613834	3–4	QBT3	—	1.11 (UJ)	—	—	—	—	—	—	—	—
RE21-11-3866	21-613835	2–3	QBT3	—	0.984 (UJ)	—	—	—	—	—	—	—	—
RE21-11-3867	21-613835	3–4	SOIL	—	1.13 (UJ)	—	—	0.566 (U)	—	—	—	—	—
RE21-11-3868	21-613836	10–11	QBT3	—	1 (U)	—	—	—	—	30.1	—	4.91	—
RE21-11-3869	21-613836	12–13	QBT3	—	1.07 (U)	—	—	—	—	20	—	5.02	—
RE21-11-3870	21-613837	10–11	QBT3	—	1.05 (U)	—	—	—	—	19.7	—	—	—
RE21-11-3871	21-613837	12–13	QBT3	—	1.04 (U)	—	—	—	—	17.3	—	—	—
RE21-11-3872	21-613838	7–8	SOIL	—	1.1 (U)	—	—	0.552 (U)	—	—	—	—	—
RE21-11-3873	21-613838	9–10	SOIL	—	1.11 (U)	—	—	0.555 (U)	—	—	9.18 (J)	—	—
RE21-11-3874	21-613839	5–6	SOIL	—	1.25 (U)	—	—	0.507 (U)	8340 (J)	—	—	—	—
RE21-11-3875	21-613839	7–8	SOIL	—	0.878 (U)	—	—	0.555 (U)	—	—	—	—	—
RE21-11-3890	21-613847	6–7	SOIL	—	0.941 (U)	—	—	0.471 (U)	—	—	—	16.3	—
RE21-11-3891	21-613847	8–9	SOIL	—	1.11 (U)	—	—	0.554 (U)	—	20.2	—	—	—
RE21-11-3892	21-613848	10–11	QBT3	—	1.07 (U)	—	—	—	—	17.3	—	—	—
RE21-11-3893	21-613848	12–13	QBT3	—	1.07 (U)	—	—	—	—	7.75	—	—	—
RE21-11-3894	21-613849	2–3	SOIL	—	1.12 (U)	—	—	0.558 (U)	—	—	—	—	—
RE21-11-3895	21-613849	4–5	SOIL	—	1.2 (U)	—	—	0.598 (U)	—	—	—	—	—

Table 7.1-6 (continued)

Sample ID	Location ID	Depth (ft)	Media	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Zinc
Qbt 2, 3, 4 BV[a]				**11.2**	**1690**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**63.5**
Soil BV[a]				**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**48.8**
Construction Worker SSL[b]				**800**	**na**	**463**	**92.9[e]**	**6190**	**496000**	**217**	**1550**	**1550**	**92900**
Industrial SSL[b]				**800**	**na**	**145000**	**310[f]**	**22700**	**1820000**	**795**	**5680**	**5680**	**341000**
Residential SSL[b]				**400**	**na**	**10700**	**23[f]**	**1560**	**125000**	**54.8**	**391**	**391**	**23500**
RE21-11-3822	21-613813	4–5	SOIL	—	—	—	—	—	4.92	—	—	—	—
RE21-11-3823	21-613813	6–7	QBT3	—	—	—	—	—	10.2	—	0.978	—	—
RE21-11-3824	21-613814	6–7	SOIL	—	—	—	—	—	1.74	—	—	—	—
RE21-11-3825	21-613814	8–9	SOIL	—	—	—	—	—	2.01	—	—	—	—
RE21-11-3826	21-613815	7–8	SOIL	—	—	—	—	—	1.32	0.000689 (J)	—	—	—
RE21-11-3827	21-613815	9–10	QBT3	—	—	—	—	—	—	—	1.01 (UJ)	—	—
RE21-11-3828	21-613816	7–8	SOIL	—	—	—	—	—	2.09	—	—	—	—
RE21-11-3829	21-613816	9–10	QBT3	12.7	—	—	—	7.51	2.03	—	1.13 (UJ)	—	—
RE21-11-3832	21-613818	6–7	QBT3	—	—	—	—	—	1.2	—	1.06 (UJ)	—	—
RE21-11-3833	21-613818	8–9	QBT3	—	—	—	—	—	1.18	—	1.04 (UJ)	—	—
RE21-11-3834	21-613819	5–6	QBT3	—	—	—	0.145	—	1.25	0.000757 (J)	0.957 (UJ)	—	—
RE21-11-3835	21-613819	7–8	QBT3	—	—	—	—	—	—	—	0.952 (UJ)	—	—
RE21-11-3836	21-613820	4–5	QBT3	—	—	—	—	—	1.53	—	1.02 (UJ)	—	—
RE21-11-3837	21-613820	6–7	QBT3	—	—	—	—	—	1.18	—	1.03 (UJ)	—	—
RE21-11-3838	21-613821	4–5	QBT3	—	1770 (J+)	—	—	6.77	—	—	1.1 (UJ)	—	—
RE21-11-3839	21-613821	6–7	QBT3	—	—	—	—	7.64	1.23	—	1.12 (UJ)	—	—
RE21-11-3840	21-613822	4–5	QBT3	—	—	—	—	—	1.21	—	1.03 (UJ)	—	—
RE21-11-3841	21-613822	6–7	QBT3	—	—	—	—	—	1.12	—	1.04 (UJ)	—	—
RE21-11-3842	21-613823	4–5	QBT3	—	—	—	—	—	1.36	—	1.07 (UJ)	—	—
RE21-11-3843	21-613823	6–7	QBT3	—	—	—	—	—	—	—	1.03 (UJ)	—	—
RE21-11-3844	21-613824	4–5	SOIL	—	—	—	0.158	—	1.19	—	-	—	—
RE21-11-3845	21-613824	6–7	QBT3	—	—	—	—	—	1.14	—	1.03 (UJ)	—	—
RE21-11-3846	21-613825	4–5	QBT3	16.3	—	—	—	—	1.15	—	1.01 (UJ)	—	—
RE21-11-3847	21-613825	6–7	QBT3	11.3	—	—	—	—	1.08	—	0.985 (UJ)	—	—
RE21-11-3848	21-613826	4–5	SOIL	—	—	—	0.138	—	1.41	0.00122 (J)	—	—	—
RE21-11-3849	21-613826	6–7	QBT3	—	—	—	—	7.82	—	0.00286	1.07 (UJ)	—	—
RE21-11-3850	21-613827	4–5	SOIL	—	—	—	—	—	10.3	0.000786 (J)	—	—	195
RE21-11-3851	21-613827	6–7	SOIL	—	—	—	0.258	—	1.59	0.001 (J)	—	—	—
RE21-11-3852	21-613828	5–6	SOIL	—	—	—	—	—	1.23	—	—	—	—
RE21-11-3853	21-613828	7–8	SOIL	—	—	—	—	—	1.35	—	—	—	—
RE21-11-3854	21-613829	5–6	SOIL	—	—	—	—	—	1.39	—	—	—	—
RE21-11-3855	21-613829	7–8	QBT3	13.2	—	—	—	—	—	—	1.02 (UJ)	—	—
RE21-11-3864	21-613834	1–2	SOIL	—	—	—	0.181	—	1.16	0.00113 (J)	—	—	—

Table 7.1-6 (continued)

Sample ID	Location ID	Depth (ft)	Media	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Zinc
Qbt 2, 3, 4 BV[a]				**11.2**	**1690**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**63.5**
Soil BV[a]				**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**48.8**
Construction Worker SSL[b]				**800**	**na**	**463**	**92.9[e]**	**6190**	**496000**	**217**	**1550**	**1550**	**92900**
Industrial SSL[b]				**800**	**na**	**145000**	**310[f]**	**22700**	**1820000**	**795**	**5680**	**5680**	**341000**
Residential SSL[b]				**400**	**na**	**10700**	**23[f]**	**1560**	**125000**	**54.8**	**391**	**391**	**23500**
RE21-11-3865	21-613834	3–4	QBT3	—	—	—	—	—	1.51	—	1.14 (U)	—	—
RE21-11-3866	21-613835	2–3	QBT3	—	—	—	—	—	1.56	—	1.08 (U)	—	—
RE21-11-3867	21-613835	3–4	SOIL	—	—	—	—	—	1.68	—	—	—	—
RE21-11-3868	21-613836	10–11	QBT3	—	—	—	—	—	1.56	—	1.07 (U)	—	—
RE21-11-3869	21-613836	12–13	QBT3	—	—	—	—	—	1.64	—	1.07 (U)	—	—
RE21-11-3870	21-613837	10–11	QBT3	—	—	—	—	—	1.61	—	1.01 (U)	—	—
RE21-11-3871	21-613837	12–13	QBT3	—	—	—	—	—	1.66	—	1.07 (U)	—	—
RE21-11-3872	21-613838	7–8	SOIL	—	—	—	—	—	2.57	—	—	—	—
RE21-11-3873	21-613838	9–10	SOIL	—	—	741 (J)	—	—	2.52	—	—	—	—
RE21-11-3874	21-613839	5–6	SOIL	—	—	—	—	—	—	—	—	—	—
RE21-11-3875	21-613839	7–8	SOIL	—	—	—	—	—	—	—	—	—	—
RE21-11-3890	21-613847	6–7	SOIL	—	—	—	—	—	2.8	—	—	2.35 (U)	—
RE21-11-3891	21-613847	8–9	SOIL	—	—	—	—	—	2.31	—	—	—	—
RE21-11-3892	21-613848	10–11	QBT3	—	—	—	—	—	1.37	—	1.02 (U)	—	—
RE21-11-3893	21-613848	12–13	QBT3	—	—	—	—	—	1.38	—	1.1 (U)	—	—
RE21-11-3894	21-613849	2–3	SOIL	—	—	—	—	—	1.99	—	—	—	—
RE21-11-3895	21-613849	4–5	SOIL	—	—	—	0.116	—	1.88	—	—	—	—

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

[a] BVs are from LANL (1998, 059730).

[b] SSLs are from NMED (2009, 108070) unless otherwise noted.

[c] na = Not available.

[d] SSLs are for hexavalent chromium.

[e] Construction Worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2009, 108070).

[f] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[g] — = Not detected or not detected above BV.

Table 7.1-7
Organic Chemicals Detected at SWMU 21-011(b)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Chrysene
Construction Worker SSL[a]				**18600**	**263000**	**66800**	**4.36**	**213**	**21.3**	**213**	**6680[b]**	**2060**	**4760**	**20600**
Industrial SSL[a]				**36700**	**851000**	**183000**	**8.26**	**23.4**	**2.34**	**23.4**	**18300[b]**	**234**	**1370**	**2340**
Residential SSL[a]				**3440**	**67500**	**17200**	**1.12**	**6.21**	**0.621**	**6.21**	**1720[b]**	**62.1**	**347**	**621**
RE21-11-3822	21-613813	4–5	SOIL	—[c]	—	—	NA[d]	—	—	—	—	—	—	—
RE21-11-3823	21-613813	6–7	QBT3	—	—	0.0168 (J)	NA	0.03 (J)	0.0214 (J)	0.0239 (J)	0.0111 (J)	0.0118 (J)	—	0.0268 (J)
RE21-11-3824	21-613814	6–7	SOIL	—	—	—	NA	—	—	—	—	—	—	—
RE21-11-3825	21-613814	8–9	SOIL	—	—	—	NA	—	—	—	—	—	—	—
RE21-11-3826	21-613815	7–8	SOIL	0.0152 (J)	—	0.0758 (J)	NA	0.226 (J)	0.144 (J)	0.252 (J)	—	0.0818 (J)	0.114 (J)	0.238 (J)
RE21-11-3827	21-613815	9–10	QBT3	—	—	—	NA	0.0336 (J)	0.016 (J)	0.0302 (J)	—	0.0146 (J)	—	0.0255 (J)
RE21-11-3832	21-613818	6–7	QBT3	—	—	—	NA	0.0142 (J)	0.0294 (J)	0.0145 (J)	—	—	—	0.011 (J)
RE21-11-3833	21-613818	8–9	QBT3	—	0.00337 (J)	—	NA	—	—	—	—	—	—	—
RE21-11-3834	21-613819	5–6	QBT3	—	—	—	NA	0.0207 (J)	0.033 (J)	0.026 (J)	—	—	—	0.0186 (J)
RE21-11-3835	21-613819	7–8	QBT3	—	0.00176 (J)	—	NA	—	—	—	—	—	—	—
RE21-11-3836	21-613820	4–5	QBT3	—	—	—	NA	—	—	—	—	—	—	—
RE21-11-3842	21-613823	4–5	QBT3	—	—	—	NA	0.0173 (J)	0.0158 (J)	0.0223 (J)	—	—	—	0.0158 (J)
RE21-11-3844	21-613824	4–5	SOIL	—	—	0.00727 (J)	NA	0.076	0.088	0.113	0.0396	0.0494	—	0.0902
RE21-11-3846	21-613825	4–5	QBT3	—	—	—	NA	—	—	—	—	—	—	—
RE21-11-3847	21-613825	6–7	QBT3	—	—	—	NA	—	—	—	—	—	—	—
RE21-11-3848	21-613826	4–5	SOIL	—	—	0.0102 (J)	NA	0.0632	0.0695	0.126	0.0462	—	2.34	0.0603
RE21-11-3850	21-613827	4–5	SOIL	—	—	0.0096 (J)	NA	0.0224 (J)	0.0185 (J)	0.0252 (J)	—	0.0124 (J)	—	0.0206 (J)
RE21-11-3864	21-613834	1–2	SOIL	0.0157 (J)	—	0.0462	NA	0.179	0.206	0.257	0.126	0.078	—	0.198
RE21-11-3866	21-613835	2–3	QBT3	—	—	—	NA	0.0276 (J)	0.0269 (J)	0.0375	—	—	—	0.0213 (J)
RE21-11-3867	21-613835	3–4	SOIL	—	—	—	NA	0.0122 (J)	—	—	—	—	—	—
RE21-11-3868	21-613836	10–11	QBT3	—	0.00241 (J)	—	NA	—	—	—	—	—	—	—
RE21-11-3869	21-613836	12–13	QBT3	—	0.00216 (J)	—	NA	—	—	—	—	—	—	—
RE21-11-3870	21-613837	10–11	QBT3	—	0.00219 (J)	—	NA	—	—	—	—	—	—	—
RE21-11-3871	21-613837	12–13	QBT3	—	—	—	NA	0.0199 (J)	—	—	—	—	—	0.017 (J)
RE21-11-3872	21-613838	7–8	SOIL	—	—	—	NA	0.0211 (J)	0.0163 (J)	0.0236 (J)	—	—	—	0.0155 (J)

Table 7.1-7 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Chrysene
Construction Worker SSL[a]				**18600**	**263000**	**66800**	**4.36**	**213**	**21.3**	**213**	**6680[b]**	**2060**	**4760**	**20600**
Industrial SSL[a]				**36700**	**851000**	**183000**	**8.26**	**23.4**	**2.34**	**23.4**	**18300[b]**	**234**	**1370**	**2340**
Residential SSL[a]				**3440**	**67500**	**17200**	**1.12**	**6.21**	**0.621**	**6.21**	**1720[b]**	**62.1**	**347**	**621**
RE21-11-3873	21-613838	9–10	SOIL	—	—	—	NA	—	—	—	—	—	—	—
RE21-11-3874	21-613839	5–6	SOIL	—	—	0.00747 (J)	NA	0.0381	0.0349 (J)	0.0484	—	0.0203 (J)	—	0.0359
RE21-11-3890	21-613847	6–7	SOIL	—	—	0.0101 (J)	—	0.0476	0.0408	0.0545	0.0281 (J)	0.027 (J)	—	0.0382
RE21-11-3891	21-613847	8–9	SOIL	—	—	0.0195 (J)	—	0.0901	0.0764	0.105	0.0382	0.05	—	0.0611
RE21-11-3892	21-613848	10–11	QBT3	—	0.00328 (J)	—	—	—	—	—	—	—	—	—
RE21-11-3893	21-613848	12–13	QBT3	—	0.00247 (J)	—	—	—	—	—	—	—	—	—
RE21-11-3894	21-613849	2–3	SOIL	—	—	—	0.0045	0.0146 (J)	—	0.0158 (J)	—	—	—	—
RE21-11-3895	21-613849	4–5	SOIL	—	—	—	0.0106 (J)	0.0364 (J)	0.036 (J)	0.0525	0.0154 (J)	0.0186 (J)	—	0.0303 (J)

Table 7.1-7 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenz(a,h)anthracene	Diethylphthalate	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxins (Total)
Construction Worker SSL[a]				**21.3**	**191000**	**8910**	**8910**	**na[e]**	**na**	**na**	**na**	**na**	**na**
Industrial SSL[a]				**2.34**	**547000**	**24400**	**24400**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**0.621**	**48900**	**2290**	**2290**	**na**	**na**	**na**	**na**	**na**	**na**
RE21-11-3822	21-613813	4–5	SOIL	—	—	0.0207 (J)	—	NA	NA	NA	NA	NA	NA
RE21-11-3823	21-613813	6–7	QBT3	—	3.06	0.0592	—	NA	NA	NA	NA	NA	NA
RE21-11-3824	21-613814	6–7	SOIL	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-3825	21-613814	8–9	SOIL	—	—	0.0123 (J)	—	NA	NA	NA	NA	NA	NA
RE21-11-3826	21-613815	7–8	SOIL	0.0418 (J)	—	0.513 (J)	0.0188 (J)	NA	NA	NA	NA	NA	NA
RE21-11-3827	21-613815	9–10	QBT3	—	—	0.0557 (J)	—	NA	NA	NA	NA	NA	NA
RE21-11-3832	21-613818	6–7	QBT3	—	—	0.0188 (J)	—	NA	NA	NA	NA	NA	NA
RE21-11-3833	21-613818	8–9	QBT3	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-3834	21-613819	5–6	QBT3	—	—	0.0421	—	NA	NA	NA	NA	NA	NA
RE21-11-3835	21-613819	7–8	QBT3	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-3836	21-613820	4–5	QBT3	—	—	0.0163 (J)	—	NA	NA	NA	NA	NA	NA
RE21-11-3842	21-613823	4–5	QBT3	—	—	0.0285 (J)	—	NA	NA	NA	NA	NA	NA
RE21-11-3844	21-613824	4–5	SOIL	—	—	0.118	—	NA	NA	NA	NA	NA	NA
RE21-11-3846	21-613825	4–5	QBT3	—	—	0.013 (J)	—	NA	NA	NA	NA	NA	NA
RE21-11-3847	21-613825	6–7	QBT3	—	—	-	—	NA	NA	NA	NA	NA	NA
RE21-11-3848	21-613826	4–5	SOIL	—	—	0.114	—	NA	NA	NA	NA	NA	NA
RE21-11-3850	21-613827	4–5	SOIL	—	—	0.0469	—	NA	NA	NA	NA	NA	NA
RE21-11-3864	21-613834	1–2	SOIL	—	—	0.335	—	NA	NA	NA	NA	NA	NA
RE21-11-3866	21-613835	2–3	QBT3	—	—	0.0405	—	NA	NA	NA	NA	NA	NA
RE21-11-3867	21-613835	3–4	SOIL	—	—	0.0134 (J)	—	NA	NA	NA	NA	NA	NA
RE21-11-3868	21-613836	10–11	QBT3	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-3869	21-613836	12–13	QBT3	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-3870	21-613837	10–11	QBT3	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-3871	21-613837	12–13	QBT3	—	—	0.0243 (J)	—	NA	NA	NA	NA	NA	NA
RE21-11-3872	21-613838	7–8	SOIL	—	—	0.0211 (J)	—	NA	NA	NA	NA	NA	NA
RE21-11-3873	21-613838	9–10	SOIL	—	—	0.0164 (J)	—	NA	NA	NA	NA	NA	NA

Table 7.1-7 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenz(a,h)anthracene	Diethylphthalate	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxins (Total)
Construction Worker SSL[a]				**21.3**	**191000**	**8910**	**8910**	**na[e]**	**na**	**na**	**na**	**na**	**na**
Industrial SSL[a]				**2.34**	**547000**	**24400**	**24400**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**0.621**	**48900**	**2290**	**2290**	**na**	**na**	**na**	**na**	**na**	**na**
RE21-11-3874	21-613839	5–6	SOIL	—	—	0.0622	—	NA	NA	NA	NA	NA	NA
RE21-11-3890	21-613847	6–7	SOIL	—	—	0.0765	—	—	—	—	—	—	—
RE21-11-3891	21-613847	8–9	SOIL	—	—	0.13	—	—	—	—	—	—	—
RE21-11-3892	21-613848	10–11	QBT3	—	—	—	—	—	—	—	—	—	—
RE21-11-3893	21-613848	12–13	QBT3	—	—	—	—	—	—	—	—	—	—
RE21-11-3894	21-613849	2–3	SOIL	—	—	0.0182 (J)	—	0.00000465 (J)	0.00000883	0.000000627 (J)	0.00000188 (J)	—	0.000000521 (J)
RE21-11-3895	21-613849	4–5	SOIL	—	—	0.0428	—	0.0000133	0.0000254	0.00000203 (J)	0.00000597	0.000000585 (J)	0.00000272 (J)

Table 7.1-7 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofurans (Total)	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzofurans (Totals)
Construction Worker SSL[a]				**na**	**1530[f]**	**213**	**10300[g]**	**10600**	**na**	**na**	**7150**	**6680**	**na**
Industrial SSL[a]				**na**	**1400[h]**	**23.4**	**14900[g]**	**1090**	**na**	**na**	**20500**	**18300**	**na**
Residential SSL[a]				**na**	**210[h]**	**6.21**	**3210[g]**	**199**	**na**	**na**	**1830**	**1720**	**na**
RE21-11-3822	21-613813	4–5	SOIL	NA	—	—	—	—	NA	NA	—	0.0265 (J)	NA
RE21-11-3823	21-613813	6–7	QBT3	NA	—	—	—	—	NA	NA	0.0617	0.0656	NA
RE21-11-3824	21-613814	6–7	SOIL	NA	—	—	0.000943 (J)	—	NA	NA	—	—	NA
RE21-11-3825	21-613814	8–9	SOIL	NA	—	—	—	—	NA	NA	—	0.0147 (J)	NA
RE21-11-3826	21-613815	7–8	SOIL	NA	—	NA	—	—	NA	NA	0.164 (J)	0.438 (J)	NA
RE21-11-3827	21-613815	9–10	QBT3	NA	—	NA	—	—	NA	NA	0.0126 (J)	0.0492 (J)	NA
RE21-11-3832	21-613818	6–7	QBT3	NA	—	—	—	—	NA	NA	—	0.0117 (J)	NA
RE21-11-3833	21-613818	8–9	QBT3	NA	—	—	—	—	NA	NA	—	—	NA
RE21-11-3834	21-613819	5–6	QBT3	NA	—	—	—	—	NA	NA	0.0196 (J)	0.0298 (J)	NA
RE21-11-3835	21-613819	7–8	QBT3	NA	—	—	—	—	NA	NA	—	—	NA
RE21-11-3836	21-613820	4–5	QBT3	NA	—	—	—	—	NA	NA	—	—	NA
RE21-11-3842	21-613823	4–5	QBT3	NA	—	—	—	—	NA	NA	0.0142 (J)	0.0243 (J)	NA
RE21-11-3844	21-613824	4–5	SOIL	NA	—	0.0356 (J)	—	—	NA	NA	0.0371	0.128	NA
RE21-11-3846	21-613825	4–5	QBT3	NA	—	—	—	—	NA	NA	—	0.0161 (J)	NA
RE21-11-3847	21-613825	6–7	QBT3	NA	0.0939	—	—	—	NA	NA	—	—	NA
RE21-11-3848	21-613826	4–5	SOIL	NA	—	0.0325 (J)	—	—	NA	NA	0.0685	0.144	NA
RE21-11-3850	21-613827	4–5	SOIL	NA	—	—	—	—	NA	NA	0.0441	0.0487	NA
RE21-11-3864	21-613834	1–2	SOIL	NA	—	0.0973	—	—	NA	NA	0.218	0.592	NA
RE21-11-3866	21-613835	2–3	QBT3	NA	—	—	—	—	NA	NA	0.0243 (J)	0.074	NA
RE21-11-3867	21-613835	3–4	SOIL	NA	—	—	—	—	NA	NA	—	0.0191 (J)	NA
RE21-11-3868	21-613836	10–11	QBT3	NA	—	—	—	—	NA	NA	—	—	NA
RE21-11-3869	21-613836	12–13	QBT3	NA	—	—	—	—	NA	NA	—	—	NA
RE21-11-3870	21-613837	10–11	QBT3	NA	—	—	—	—	NA	NA	—	—	NA
RE21-11-3871	21-613837	12–13	QBT3	NA	—	—	—	—	NA	NA	0.0228 (J)	0.0608	NA
RE21-11-3872	21-613838	7–8	SOIL	NA	—	—	—	—	NA	NA	—	0.0399	NA
RE21-11-3873	21-613838	9–10	SOIL	NA	—	—	—	—	NA	NA	—	0.0186 (J)	NA

Table 7.1-7 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofurans (Total)	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzofurans (Totals)
Construction Worker SSL[a]				**na**	**1530[f]**	**213**	**10300[g]**	**10600**	**na**	**na**	**7150**	**6680**	**na**
Industrial SSL[a]				**na**	**1400[h]**	**23.4**	**14900[g]**	**1090**	**na**	**na**	**20500**	**18300**	**na**
Residential SSL[a]				**na**	**210[h]**	**6.21**	**3210[g]**	**199**	**na**	**na**	**1830**	**1720**	**na**
RE21-11-3874	21-613839	5–6	SOIL	NA	—	0.0132 (J)	—	0.00249 (J)	NA	NA	0.0327 (J)	0.0633	NA
RE21-11-3890	21-613847	6–7	SOIL	—	—	0.0216 (J)	—	—	0.00000192 (J)	—	0.048	0.0916	—
RE21-11-3891	21-613847	8–9	SOIL	—	—	0.0306 (J)	—	—	0.00000694 (J)	—	0.0898	0.151	—
RE21-11-3892	21-613848	10–11	QBT3	—	—	—	—	—	0.0000017 (J)	—	—	—	—
RE21-11-3893	21-613848	12–13	QBT3	—	—	—	—	—	0.00000118 (J)	—	—	—	—
RE21-11-3894	21-613849	2–3	SOIL	0.00000156 (J)	—	—	—	—	0.0000397	—	—	0.0221 (J)	—
RE21-11-3895	21-613849	4–5	SOIL	0.0000048	—	0.0129 (J)	—	—	0.000132	0.000000732 (J)	0.0259 (J)	0.0691	0.000000826 (J)

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

[a] SSLs are from NMED (2009, 108070) unless otherwise noted.

[b] Pyrene SSL used as surrogate based on structural similarity.

[c] — = Not detected.

[d] NA = Not analyzed.

[e] na = Not available.

[f] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2009, 108070).

[g] Isopropylbenzene SSL used as surrogate based on structural similarity.

[h] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table 7.1-8
Radionuclides Detected or Detected above BVs/FVs at SWMU 21-011(b)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Thorium-228	Tritium	Uranium-235/236
Qbt 2, 3, 4 BV/FV[a]				**na[b]**	**na**	**na**	**na**	**2.52**	**na**	**0.09**
Soil BV/FV[a]				**0.013**	**1.65**	**0.023**	**0.054**	**2.28**	**na**	**0.2**
Construction Worker SAL[c]				**34**	**18**	**40**	**36**	**6.8**	**320000**	**43**
Industrial SAL[c]				**180**	**23**	**240**	**210**	**9**	**440000**	**87**
Residential SAL[c]				**30**	**5.6**	**37**	**33**	**2.3**	**750**	**17**
RE21-11-3822	21-613813	4–5	SOIL	0.033	—[d]	—	0.305	—	0.398908	—
RE21-11-3823	21-613813	6–7	QBT3	0.121	—	—	0.172	—	0.157963	—
RE21-11-3824	21-613814	6–7	SOIL	—	—	—	—	—	0.0622107	—
RE21-11-3825	21-613814	8–9	SOIL	—	—	—	0.139	2.3 (J-)	0.064899	—
RE21-11-3826	21-613815	7–8	SOIL	—	—	—	0.052	—	37.4835	—
RE21-11-3827	21-613815	9–10	QBT3	—	—	—	—	—	2.54457	—
RE21-11-3828	21-613816	7–8	SOIL	—	—	—	—	—	0.683865	—
RE21-11-3829	21-613816	9–10	QBT3	—	—	—	—	—	0.415497	—
RE21-11-3832	21-613818	6–7	QBT3	0.0223	—	—	0.616	—	0.0291015	—
RE21-11-3833	21-613818	8–9	QBT3	—	—	—	—	—	0.0179911	—
RE21-11-3834	21-613819	5–6	QBT3	0.0371	—	—	0.404	—	2.95654	—
RE21-11-3835	21-613819	7–8	QBT3	—	—	—	—	—	0.0593849	—
RE21-11-3836	21-613820	4–5	QBT3	—	—	—	0.282	—	0.0219037	—
RE21-11-3837	21-613820	6–7	QBT3	—	—	—	0.0338	—	0.0270851	—
RE21-11-3838	21-613821	4–5	QBT3	0.0335	—	—	0.46	—	0.159885	—
RE21-11-3839	21-613821	6–7	QBT3	—	—	—	0.0283	—	0.14533	—
RE21-11-3840	21-613822	4–5	QBT3	0.0237	—	—	0.609	—	0.0485838	—
RE21-11-3841	21-613822	6–7	QBT3	—	—	—	0.0389	—	0.13059	—
RE21-11-3842	21-613823	4–5	QBT3	0.0342	—	0.0142	0.977	—	246.59	—
RE21-11-3843	21-613823	6–7	QBT3	—	—	—	0.114	—	43.2209	—
RE21-11-3844	21-613824	4–5	SOIL	0.0287	0.115	—	0.451	—	0.143762	—
RE21-11-3845	21-613824	6–7	QBT3	—	—	—	0.0995	—	0.068822	—
RE21-11-3846	21-613825	4–5	QBT3	0.0697	—	0.0299	5.81	—	3.66165	—
RE21-11-3847	21-613825	6–7	QBT3	—	—	—	0.0629	—	0.4375	—
RE21-11-3848	21-613826	4–5	SOIL	0.0496	0.209	—	0.498	—	1562.96	—
RE21-11-3849	21-613826	6–7	QBT3	—	—	—	0.0352	—	9.93569	0.0949
RE21-11-3850	21-613827	4–5	SOIL	—	—	—	0.0645	—	0.193464	—
RE21-11-3851	21-613827	6–7	SOIL	—	—	—	0.0489	—	0.512025	—
RE21-11-3852	21-613828	5–6	SOIL	—	—	—	—	NA[e]	0.034977	—
RE21-11-3853	21-613828	7–8	SOIL	—	NA	—	0.0366	NA	0.038216	—
RE21-11-3854	21-613829	5–6	SOIL	0.0266	—	—	0.219	NA	0.0322162	—

Table 7.1-8 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Thorium-228	Tritium	Uranium-235/236
Qbt 2, 3, 4 BV/FV[a]				**na[b]**	**na**	**na**	**na**	**2.52**	**na**	**0.09**
Soil BV/FV[a]				**0.013**	**1.65**	**0.023**	**0.054**	**2.28**	**na**	**0.2**
Construction Worker SAL[c]				**34**	**18**	**40**	**36**	**6.8**	**320000**	**43**
Industrial SAL[c]				**180**	**23**	**240**	**210**	**9**	**440000**	**87**
Residential SAL[c]				**30**	**5.6**	**37**	**33**	**2.3**	**750**	**17**
RE21-11-3855	21-613829	7–8	QBT3	—	—	—	0.0883	NA	—	0.0903 (J+)
RE21-11-3864	21-613834	1–2	SOIL	—	—	—	0.115	—	0.58843	—
RE21-11-3865	21-613834	3–4	QBT3	—	—	—	—	—	0.643349	—
RE21-11-3866	21-613835	2–3	QBT3	—	—	—	—	—	0.890261	—
RE21-11-3867	21-613835	3–4	SOIL	—	—	—	—	—	0.853234	—
RE21-11-3868	21-613836	10–11	QBT3	—	—	—	—	—	0.936483	—
RE21-11-3869	21-613836	12–13	QBT3	—	—	—	—	—	0.93	—
RE21-11-3870	21-613837	10–11	QBT3	—	—	—	—	—	0.877324	—
RE21-11-3871	21-613837	12–13	QBT3	—	—	—	—	—	0.853054	—
RE21-11-3872	21-613838	7–8	SOIL	—	—	—	—	—	1.17778	—
RE21-11-3873	21-613838	9–10	SOIL	0.0243	—	—	0.0447	—	1.51767	—
RE21-11-3874	21-613839	5–6	SOIL	—	—	—	0.0619	—	1.29147	—
RE21-11-3875	21-613839	7–8	SOIL	—	—	—	-	—	1.8968	—
RE21-11-3890	21-613847	6–7	SOIL	40.6 (J-)	—	—	1620	—	18.3964	—
RE21-11-3891	21-613847	8–9	SOIL	12.4	—	—	596	—	4.88423	—
RE21-11-3892	21-613848	10–11	QBT3	—	—	—	—	—	0.67977	—
RE21-11-3893	21-613848	12–13	QBT3	—	—	—	—	—	1.01143	—
RE21-11-3894	21-613849	2–3	SOIL	—	—	—	—	—	0.750476	—
RE21-11-3895	21-613849	4–5	SOIL	—	—	—	—	—	1.05168	—

Note: Results are in pCi/g.

[a] BVs/FVs are from LANL (1998, 059730).

[b] na = Not available.

[c] SALs are from LANL (2009, 107655).

[d] — = Not detected or not detected above BV/FV.

[e] NA = Not analyzed.

Table 7.1-9
Samples Collected at Former Building 21-152 and Associated Former Structures Footprints

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Asbestos	Dioxins/Furans	Gamma-Emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	TPH-DRO	TPH-GRO	VOCs	Cyanide (Total)
RE21-11-7843	21-614180	1–2	SOIL	—*	—	—	—	—	—	—	—	—	—	—	—	—	—	11-1959	—	11-1959	11-1959	11-1959	11-1960
RE21-11-7844	21-614180	3–4	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11-1959	—	11-1959	11-1959	11-1959	11-1960
RE21-11-7845	21-614180	5–6	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11-1959	—	11-1959	11-1959	11-1959	11-1960
RE21-11-7846	21-614181	1–2	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11-1959	—	11-1959	11-1959	11-1959	11-1960
RE21-11-7847	21-614181	3–4	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11-1959	—	11-1959	11-1959	11-1959	11-1960
RE21-11-7848	21-614181	5–6	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11-1959	—	11-1959	11-1959	11-1959	11-1960
RE21-11-7849	21-614182	6–7	QBT3	11-2012	11-2009	11-2010	—	11-2012	11-2012	—	11-2012	11-2012	11-2012	11-2009	—	11-2009	11-2012	11-2008	11-2012	—	—	11-2008	11-2009
RE21-11-7850	21-614182	8–9	QBT3	11-2012	11-2009	11-2010	—	11-2012	11-2012	—	11-2012	11-2012	11-2012	11-2009	—	11-2009	11-2012	11-2008	11-2012	—	—	11-2008	11-2009
RE21-11-7851	21-614183	6–7	QBT3	11-2037	11-2037	11-2038	—	11-2037	11-2037	—	11-2037	11-2037	11-2037	11-2037	—	11-2037	11-2037	11-2037	11-2037	—	—	11-2037	11-2037
RE21-11-7852	21-614183	8–9	QBT3	11-2037	11-2037	11-2038	—	11-2037	11-2037	—	11-2037	11-2037	11-2037	11-2037	—	11-2037	11-2037	11-2037	11-2037	—	—	11-2037	11-2037
RE21-11-7853	21-614184	6–7	QBT3	11-2058	11-2056	11-2057	—	11-2058	11-2058	—	11-2058	11-2058	11-2058	11-2056	—	11-2056	11-2058	11-2055	11-2058	—	—	11-2055	11-2056
RE21-11-7854	21-614184	8–9	QBT3	11-2058	11-2056	11-2057	—	11-2058	11-2058	—	11-2058	11-2058	11-2058	11-2056	—	11-2056	11-2058	11-2055	11-2058	—	—	11-2055	11-2056
RE21-11-7855	21-614185	6–7	QBT3	11-2058	11-2056	11-2057	—	11-2058	11-2058	—	11-2058	11-2058	11-2058	11-2056	—	11-2056	11-2058	11-2055	11-2058	—	—	11-2055	11-2056
RE21-11-7856	21-614185	8–9	QBT3	11-2058	11-2056	11-2057	—	11-2058	11-2058	—	11-2058	11-2058	11-2058	11-2056	—	11-2056	11-2058	11-2055	11-2058	—	—	11-2055	11-2056
RE21-11-7857	21-614186	6–7	QBT3	11-2058	11-2056	11-2057	—	11-2058	11-2058	—	11-2058	11-2058	11-2058	11-2056	—	11-2056	11-2058	11-2055	11-2058	—	—	11-2055	11-2056
RE21-11-7858	21-614186	8–9	QBT3	11-2058	11-2056	11-2057	—	11-2058	11-2058	—	11-2058	11-2058	11-2058	11-2056	—	11-2056	11-2058	11-2055	11-2058	—	—	11-2055	11-2056
RE21-11-7859	21-614187	6–7	SOIL	11-2058	11-2056	11-2057	—	11-2058	11-2058	—	11-2058	11-2058	11-2058	11-2056	—	11-2056	11-2058	11-2055	11-2058	—	—	11-2055	11-2056
RE21-11-7860	21-614187	8–9	QBT3	11-2058	11-2056	11-2057	—	11-2058	11-2058	—	11-2058	11-2058	11-2058	11-2056	—	11-2056	11-2058	11-2055	11-2058	—	—	11-2055	11-2056
RE21-11-7861	21-614188	6–7	QBT3	11-2069	11-2067	11-2068	—	11-2069	11-2069	—	11-2069	11-2069	11-2069	11-2067	—	11-2067	11-2069	11-2066	11-2069	—	—	11-2066	11-2067
RE21-11-7862	21-614188	8–9	QBT3	11-2069	11-2067	11-2068	—	11-2069	11-2069	—	11-2069	11-2069	11-2069	11-2067	—	11-2067	11-2069	11-2066	11-2069	—	—	11-2066	11-2067
RE21-11-7863	21-614189	6–7	SOIL	11-2069	11-2067	11-2068	—	11-2069	11-2069	—	11-2069	11-2069	11-2069	11-2067	—	11-2067	11-2069	11-2066	11-2069	—	—	11-2066	11-2067
RE21-11-7864	21-614189	8–9	QBT3	11-2069	11-2067	11-2068	—	11-2069	11-2069	—	11-2069	11-2069	11-2069	11-2067	—	11-2067	11-2069	11-2066	11-2069	—	—	11-2066	11-2067
RE21-11-7865	21-614190	6–7	QBT3	11-2096	11-2093	11-2094	—	11-2096	11-2096	—	11-2096	11-2096	11-2096	11-2093	—	11-2093	11-2096	11-2092	11-2096	—	—	11-2092	11-2093
RE21-11-7866	21-614190	8–9	QBT3	11-2096	11-2093	11-2094	—	11-2096	11-2096	—	11-2096	11-2096	11-2096	11-2093	—	11-2093	11-2096	11-2092	11-2096	—	—	11-2092	11-2093
RE21-11-7867	21-614191	6–7	QBT3	11-2096	11-2093	11-2094	—	11-2096	11-2096	—	11-2096	11-2096	11-2096	11-2093	—	11-2093	11-2096	11-2092	11-2096	—	—	11-2092	11-2093
RE21-11-7868	21-614191	8–9	QBT3	11-2096	11-2093	11-2094	—	11-2096	11-2096	—	11-2096	11-2096	11-2096	11-2093	—	11-2093	11-2096	11-2092	11-2096	—	—	11-2092	11-2093
RE21-11-7869	21-614192	6–7	SOIL	11-2096	11-2093	11-2094	—	11-2096	11-2096	—	11-2096	11-2096	11-2096	11-2093	—	11-2093	11-2096	11-2092	11-2096	—	—	11-2092	11-2093
RE21-11-7870	21-614192	8–9	QBT3	11-2096	11-2093	11-2094	—	11-2096	11-2096	—	11-2096	11-2096	11-2096	11-2093	—	11-2093	11-2096	11-2092	11-2096	—	—	11-2092	11-2093
RE21-11-7871	21-614193	6–7	QBT3	11-2139	11-2139	11-2140	—	11-2139	11-2139	—	11-2139	11-2139	11-2139	11-2139	—	11-2139	11-2139	11-2141	11-2139	—	—	11-2141	11-2139
RE21-11-7872	21-614193	8–9	QBT3	11-2139	11-2139	11-2140	—	11-2139	11-2139	—	11-2139	11-2139	11-2139	11-2139	—	11-2139	11-2139	11-2141	11-2139	—	—	11-2141	11-2139
RE21-11-7873	21-614194	6–7	QBT3	11-2152	11-2150	11-2151	—	11-2152	11-2152	—	11-2152	11-2152	11-2152	11-2150	—	11-2150	11-2152	11-2149	11-2152	—	—	11-2149	11-2150
RE21-11-7874	21-614194	8–9	QBT3	11-2152	11-2150	11-2151	—	11-2152	11-2152	—	11-2152	11-2152	11-2152	11-2150	—	11-2150	11-2152	11-2149	11-2152	—	—	11-2149	11-2150

Table 7.1-9 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Asbestos	Dioxins/Furans	Gamma-Emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	TPH-DRO	TPH-GRO	VOCs	Cyanide (Total)
RE21-11-7875	21-614195	6–7	QBT3	11-2152	11-2150	11-2151	—	11-2152	11-2152	—	11-2152	11-2152	11-2152	11-2150	—	11-2150	11-2152	11-2149	11-2152	—	—	11-2149	11-2150
RE21-11-7876	21-614195	8–9	QBT3	11-2152	11-2150	11-2151	—	11-2152	11-2152	—	11-2152	11-2152	11-2152	11-2150	—	11-2150	11-2152	11-2149	11-2152	—	—	11-2149	11-2150
RE21-11-7877	21-614196	6–7	QBT3	11-2152	11-2150	11-2151	—	11-2152	11-2152	—	11-2152	11-2152	11-2152	11-2150	—	11-2150	11-2152	11-2149	11-2152	—	—	11-2149	11-2150
RE21-11-7878	21-614196	8–9	QBT3	11-2152	11-2150	11-2151	—	11-2152	11-2152	—	11-2152	11-2152	11-2152	11-2150	—	11-2150	11-2152	11-2149	11-2152	—	—	11-2149	11-2150
RE21-11-7879	21-614197	6–7	QBT3	11-2291	11-2291	11-2292	—	11-2291	11-2291	—	11-2291	11-2291	11-2291	11-2291	—	11-2291	11-2291	11-2291	11-2291	—	—	11-2291	11-2291
RE21-11-7880	21-614197	8–9	QBT3	11-2291	11-2291	11-2292	—	11-2291	11-2291	—	11-2291	11-2291	11-2291	11-2291	—	11-2291	11-2291	11-2291	11-2291	—	—	11-2291	11-2291
RE21-11-7881	21-614198	6–7	QBT3	11-2308	11-2306	11-2307	—	11-2308	11-2308	—	11-2308	11-2308	11-2308	11-2306	—	11-2306	11-2308	11-2305	11-2308	—	—	11-2305	11-2306
RE21-11-7882	21-614198	8–9	QBT3	11-2308	11-2306	11-2307	—	11-2308	11-2308	—	11-2308	11-2308	11-2308	11-2306	—	11-2306	11-2308	11-2305	11-2308	—	—	11-2305	11-2306
RE21-11-7883	21-614199	6–7	QBT3	11-2308	11-2306	11-2307	—	11-2308	11-2308	—	11-2308	11-2308	11-2308	11-2306	—	11-2306	11-2308	11-2305	11-2308	—	—	11-2305	11-2306
RE21-11-7884	21-614199	8–9	QBT3	11-2308	11-2306	11-2307	—	11-2308	11-2308	—	11-2308	11-2308	11-2308	11-2306	—	11-2306	11-2308	11-2305	11-2308	—	—	11-2305	11-2306
RE21-11-7885	21-614200	6–7	QBT3	11-2308	11-2306	11-2307	—	11-2308	11-2308	—	11-2308	11-2308	11-2308	11-2306	—	11-2306	11-2308	11-2305	11-2308	—	—	11-2305	11-2306
RE21-11-7886	21-614200	8–9	QBT3	11-2308	11-2306	11-2307	—	11-2308	11-2308	—	11-2308	11-2308	11-2308	11-2306	—	11-2306	11-2308	11-2305	11-2308	—	—	11-2305	11-2306
RE21-11-7887	21-614201	6–7	QBT3	11-2334	11-2331	11-2333	—	11-2334	11-2334	—	11-2334	11-2334	11-2334	11-2331	—	11-2331	11-2334	11-2330	11-2334	—	—	11-2330	11-2331
RE21-11-7888	21-614201	8–9	QBT3	11-2334	11-2331	11-2333	—	11-2334	11-2334	—	11-2334	11-2334	11-2334	11-2331	—	11-2331	11-2334	11-2330	11-2334	—	—	11-2330	11-2331
RE21-11-7889	21-614202	6–7	QBT3	11-2334	11-2331	11-2333	—	11-2334	11-2334	—	11-2334	11-2334	11-2334	11-2331	—	11-2331	11-2334	11-2330	11-2334	—	—	11-2330	11-2331
RE21-11-7890	21-614202	8–9	QBT3	11-2334	11-2331	11-2333	—	11-2334	11-2334	—	11-2334	11-2334	11-2334	11-2331	—	11-2331	11-2334	11-2330	11-2334	—	—	11-2330	11-2331
RE21-11-7891	21-614203	6–7	QBT3	11-2341	11-2338	11-2339	—	11-2341	11-2341	—	11-2341	11-2341	11-2341	11-2338	—	11-2338	11-2341	11-2337	11-2341	—	—	11-2337	11-2338
RE21-11-7892	21-614203	8–9	QBT3	11-2341	11-2338	11-2339	—	11-2341	11-2341	—	11-2341	11-2341	11-2341	11-2338	—	11-2338	11-2341	11-2337	11-2341	—	—	11-2337	11-2338
RE21-11-7893	21-614204	6–7	QBT3	11-1960	11-1960	11-1961	11-1962	11-1960	11-1960	11-1959	11-1960	11-1960	11-1960	11-1960	11-1959	11-1960	11-1960	11-1959	11-1960	—	—	11-1959	11-1960
RE21-11-7894	21-614204	8–9	QBT3	11-1960	11-1960	11-1961	11-1962	11-1960	11-1960	11-1959	11-1960	11-1960	11-1960	11-1960	11-1959	11-1960	11-1960	11-1959	—	—	—	11-1959	11-1960
RE21-11-7895	21-614205	6–7	QBT3	11-2012	11-2009	11-2010	11-2011	11-2012	11-2012	11-2008	11-2012	11-2012	11-2012	11-2009	11-2008	11-2009	11-2012	11-2008	11-2012	—	—	11-2008	11-2009
RE21-11-7896	21-614205	8–9	QBT3	11-2012	11-2009	11-2010	11-2011	11-2012	11-2012	11-2008	11-2012	11-2012	11-2012	11-2009	11-2008	11-2009	11-2012	11-2008	11-2012	—	—	11-2008	11-2009
RE21-11-7897	21-614206	6–7	QBT3	11-2069	11-2067	11-2068	11-2070	11-2069	11-2069	11-2066	11-2069	11-2069	11-2069	11-2067	11-2066	11-2067	11-2069	11-2066	11-2069	—	—	11-2066	11-2067
RE21-11-7898	21-614206	8–9	QBT3	11-2069	11-2067	11-2068	11-2070	11-2069	11-2069	11-2066	11-2069	11-2069	11-2069	11-2067	11-2066	11-2067	11-2069	11-2066	11-2069	—	—	11-2066	11-2067
RE21-11-7899	21-614207	6–7	QBT3	11-2096	11-2093	11-2094	11-2095	11-2096	11-2096	11-2092	11-2096	11-2096	11-2096	11-2093	11-2092	11-2093	11-2096	11-2092	11-2096	—	—	11-2092	11-2093
RE21-11-7900	21-614207	8–9	QBT3	11-2096	11-2093	11-2094	11-2095	11-2096	11-2096	11-2092	11-2096	11-2096	11-2096	11-2093	11-2092	11-2093	11-2096	11-2092	11-2096	—	—	11-2092	11-2093
RE21-11-7901	21-614208	6–7	QBT3	11-2139	11-2139	11-2140	11-2184	11-2139	11-2139	11-2141	11-2139	11-2139	11-2139	11-2139	11-2141	11-2139	11-2139	11-2141	11-2139	—	—	11-2141	11-2139
RE21-11-7902	21-614208	8–9	QBT3	11-2139	11-2139	11-2140	11-2184	11-2139	11-2139	11-2141	11-2139	11-2139	11-2139	11-2139	11-2141	11-2139	11-2139	11-2141	11-2139	—	—	11-2141	11-2139
RE21-11-7903	21-614209	6–7	QBT3	11-2334	11-2331	11-2333	11-2332	11-2334	11-2334	11-2330	11-2334	11-2334	11-2334	11-2331	11-2330	11-2331	11-2334	11-2330	11-2334	—	—	11-2330	11-2331
RE21-11-7904	21-614209	8–9	QBT3	11-2334	11-2331	11-2333	11-2332	11-2334	11-2334	11-2330	11-2334	11-2334	11-2334	11-2331	11-2330	11-2331	11-2334	11-2330	11-2334	—	—	11-2330	11-2331
RE21-11-7905	21-614210	1–2	SOIL	11-1972	11-1973	11-1974	—	11-1972	11-1972	—	11-1972	11-1972	11-1972	11-1973	—	11-1973	11-1972	11-1972	11-1972	—	—	11-1972	11-1973
RE21-11-7906	21-614210	3–4	QBT3	11-1972	11-1973	11-1974	—	11-1972	11-1972	—	11-1972	11-1972	11-1972	11-1973	—	11-1973	11-1972	11-1972	11-1972	—	—	11-1972	11-1973
RE21-11-7907	21-614211	1–2	SOIL	11-1972	11-1973	11-1974	—	11-1972	11-1972	—	11-1972	11-1972	11-1972	11-1973	—	11-1973	11-1972	11-1972	11-1972	—	—	11-1972	11-1973

Table 7.1-9 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Asbestos	Dioxins/Furans	Gamma-Emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	TPH-DRO	TPH-GRO	VOCs	Cyanide (Total)
RE21-11-7908	21-614211	3–4	QBT3	11-1972	11-1973	11-1974	—	11-1972	11-1972	—	11-1972	11-1972	11-1972	11-1973	—	11-1973	11-1972	11-1972	11-1972	—	—	11-1972	11-1973
RE21-11-7909	21-614212	1–2	SOIL	11-2000	11-1997	11-1998	—	11-2000	11-2000	—	11-2000	11-2000	11-2000	11-1997	—	11-1997	11-2000	11-1996	11-2000	—	—	11-1996	11-1997
RE21-11-7910	21-614212	3–4	QBT3	11-2000	11-1997	11-1998	—	11-2000	11-2000	—	11-2000	11-2000	11-2000	11-1997	—	11-1997	11-2000	11-1996	11-2000	—	—	11-1996	11-1997
RE21-11-7911	21-614213	1–2	SOIL	11-2000	11-1997	11-1998	—	11-2000	11-2000	—	11-2000	11-2000	11-2000	11-1997	—	11-1997	11-2000	11-1996	11-2000	—	—	11-1996	11-1997
RE21-11-7912	21-614213	3–4	QBT3	11-2000	11-1997	11-1998	—	11-2000	11-2000	—	11-2000	11-2000	11-2000	11-1997	—	11-1997	11-2000	11-1996	11-2000	—	—	11-1996	11-1997
RE21-11-7913	21-614214	1–2	SOIL	11-2012	11-2009	11-2010	—	11-2012	11-2012	—	11-2012	11-2012	11-2012	11-2009	—	11-2009	11-2012	11-2008	11-2012	—	—	11-2008	11-2009
RE21-11-7914	21-614214	3–4	SOIL	11-2012	11-2009	11-2010	—	11-2012	11-2012	—	11-2012	11-2012	11-2012	11-2009	—	11-2009	11-2012	11-2008	11-2012	—	—	11-2008	11-2009
RE21-11-7915	21-614215	1–2	SOIL	11-2069	11-2067	11-2068	—	11-2069	11-2069	—	11-2069	11-2069	11-2069	11-2067	—	11-2067	11-2069	11-2066	11-2069	—	—	11-2066	11-2067
RE21-11-7916	21-614215	3–4	QBT3	11-2069	11-2067	11-2068	—	11-2069	11-2069	—	11-2069	11-2069	11-2069	11-2067	—	11-2067	11-2069	11-2066	11-2069	—	—	11-2066	11-2067
RE21-11-7917	21-614216	1–2	SOIL	11-2152	11-2150	11-2151	—	11-2152	11-2152	—	11-2152	11-2152	11-2152	11-2150	—	11-2150	11-2152	11-2149	11-2152	—	—	11-2149	11-2150
RE21-11-7918	21-614216	3–4	QBT3	11-2152	11-2150	11-2151	—	11-2152	11-2152	—	11-2152	11-2152	11-2152	11-2150	—	11-2150	11-2152	11-2149	11-2152	—	—	11-2149	11-2150
RE21-11-7919	21-614217	1–2	SOIL	11-2179	11-2176	11-2177	—	11-2179	11-2179	—	11-2179	11-2179	11-2179	11-2176	—	11-2176	11-2179	11-2175	11-2179	—	—	11-2175	11-2176
RE21-11-7920	21-614217	3–4	SOIL	11-2179	11-2176	11-2177	—	11-2179	11-2179	—	11-2179	11-2179	11-2179	11-2176	—	11-2176	11-2179	11-2175	11-2179	—	—	11-2175	11-2176
RE21-11-7921	21-614218	1–2	SOIL	11-2179	11-2176	11-2177	—	11-2179	11-2179	—	11-2179	11-2179	11-2179	11-2176	—	11-2176	11-2179	11-2175	11-2179	—	—	11-2175	11-2176
RE21-11-7922	21-614218	3–4	SOIL	11-2179	11-2176	11-2177	—	11-2179	11-2179	—	11-2179	11-2179	11-2179	11-2176	—	11-2176	11-2179	11-2175	11-2179	—	—	11-2175	11-2176
RE21-11-7923	21-614219	1–2	SOIL	11-2243	11-2241	11-2242	—	11-2243	11-2243	—	11-2243	11-2243	11-2243	11-2241	—	11-2241	11-2243	11-2240	11-2243	—	—	11-2240	11-2241
RE21-11-7924	21-614219	3–4	QBT3	11-2243	11-2241	11-2242	—	11-2243	11-2243	—	11-2243	11-2243	11-2243	11-2241	—	11-2241	11-2243	11-2240	11-2243	—	—	11-2240	11-2241
RE21-11-7925	21-614220	1–2	SOIL	11-2000	11-1997	11-1998	11-1999	11-2000	11-2000	11-1996	11-2000	11-2000	11-2000	11-1997	11-1996	11-1997	11-2000	11-1996	11-2000	—	—	11-1996	11-1997
RE21-11-7926	21-614220	3–4	QBT3	11-2000	11-1997	11-1998	11-1999	11-2000	11-2000	11-1996	11-2000	11-2000	11-2000	11-1997	11-1996	11-1997	11-2000	11-1996	11-2000	—	—	11-1996	11-1997
RE21-11-7927	21-614221	1–2	SOIL	11-2179	11-2176	11-2177	11-2178	11-2179	11-2179	11-2175	11-2179	11-2179	11-2179	11-2176	11-2175	11-2176	11-2179	11-2175	11-2179	—	—	11-2175	11-2176
RE21-11-7928	21-614221	3–4	SOIL	11-2179	11-2176	11-2177	11-2178	11-2179	11-2179	11-2175	11-2179	11-2179	11-2179	11-2176	11-2175	11-2176	11-2179	11-2175	11-2179	—	—	11-2175	11-2176
RE21-11-7933	21-614222	1–2	SOIL	11-2203	11-2201	—	11-2202	11-2203	11-2203	11-2200	11-2203	11-2203	11-2203	11-2201	11-2200	11-2201	11-2203	11-2200	11-2203	—	—	11-2200	11-2201
RE21-11-7934	21-614222	3–4	QBT3	11-2203	11-2201	—	11-2202	11-2203	11-2203	11-2200	11-2203	11-2203	11-2203	11-2201	11-2200	11-2201	11-2203	11-2200	11-2203	—	—	11-2200	11-2201
RE21-11-7997	21-614222	5–6	QBT3	11-2203	11-2201	—	11-2202	11-2203	11-2203	11-2200	11-2203	11-2203	11-2203	11-2201	11-2200	11-2201	11-2203	11-2200	11-2203	11-2200	11-2200	11-2200	11-2201
RE21-11-7936	21-614223	1–2	SOIL	11-2203	11-2201	—	11-2202	11-2203	11-2203	11-2200	11-2203	11-2203	11-2203	11-2201	11-2200	11-2201	11-2203	11-2200	11-2203	—	—	11-2200	11-2201
RE21-11-7937	21-614223	3–4	QBT3	11-2203	11-2201	—	11-2202	11-2203	11-2203	11-2200	11-2203	11-2203	11-2203	11-2201	11-2200	11-2201	11-2203	11-2200	11-2203	—	—	11-2200	11-2201
RE21-11-7938	21-614223	5–6	QBT3	11-2203	11-2201	—	11-2202	11-2203	11-2203	11-2200	11-2203	11-2203	11-2203	11-2201	11-2200	11-2201	11-2203	11-2200	11-2203	—	—	11-2200	11-2201
RE21-11-7939	21-614224	1–2	QBT3	11-2179	11-2176	—	11-2178	11-2179	11-2179	11-2175	11-2179	11-2179	11-2179	11-2176	11-2175	11-2176	11-2179	11-2175	11-2179	—	—	11-2175	11-2176
RE21-11-7940	21-614224	3–4	QBT3	11-2203	11-2201	—	11-2202	11-2203	11-2203	11-2200	11-2203	11-2203	11-2203	11-2201	11-2200	11-2201	11-2203	11-2200	11-2203	—	—	11-2200	11-2201
RE21-11-7941	21-614225	4–5	SOIL	11-2272	11-2272	—	11-2271	11-2272	11-2272	11-2272	11-2272	11-2272	11-2272	11-2272	11-2272	11-2272	11-2272	11-2272	11-2272	—	—	11-2272	11-2272
RE21-11-7942	21-614225	6–7	SOIL	11-2341	11-2338	—	11-2340	11-2341	11-2341	11-2337	11-2341	11-2341	11-2341	11-2338	11-2337	11-2338	11-2341	11-2337	11-2341	—	—	11-2337	11-2338
RE21-11-7963	21-614226	1–2	SOIL	11-2225	11-2223	—	—	11-2225	11-2225	—	11-2225	11-2225	11-2225	11-2223	—	11-2223	11-2225	11-2222	11-2225	—	—	11-2222	11-2223
RE21-11-7964	21-614226	3–4	SOIL	11-2225	11-2223	—	—	11-2225	11-2225	—	11-2225	11-2225	11-2225	11-2223	—	11-2223	11-2225	11-2222	11-2225	—	—	11-2222	11-2223

Table 7.1-9 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Asbestos	Dioxins/Furans	Gamma-Emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	TPH-DRO	TPH-GRO	VOCs	Cyanide (Total)
RE21-11-7965	21-614226	5–6	QBT3	11-2225	11-2223	—	—	11-2225	11-2225	—	11-2225	11-2225	11-2225	11-2223	—	11-2223	11-2225	11-2222	11-2225	—	—	11-2222	11-2223
RE21-11-7966	21-614227	2–3	SOIL	11-2448	11-2447	—	—	11-2448	11-2448	—	11-2448	11-2448	11-2448	11-2447	—	11-2447	11-2448	11-2446	11-2448	—	—	11-2446	11-2447
RE21-11-7967	21-614227	4–5	QBT3	11-2448	11-2447	—	—	11-2448	11-2448	—	11-2448	11-2448	11-2448	11-2447	—	11-2447	11-2448	11-2446	11-2448	—	—	11-2446	11-2447
RE21-11-7968	21-614228	7–8	SOIL	11-2484	11-2484	—	—	11-2484	11-2484	—	11-2484	11-2484	11-2484	11-2484	—	11-2484	11-2484	11-2484	11-2484	—	—	11-2484	11-2484
RE21-11-7969	21-614228	9–10	QBT3	11-2484	11-2484	—	—	11-2484	11-2484	—	11-2484	11-2484	11-2484	11-2484	—	11-2484	11-2484	11-2484	11-2484	—	—	11-2484	11-2484
RE21-11-7970	21-614229	7–8	SOIL	11-2500	11-2500	—	—	11-2500	11-2500	—	11-2500	11-2500	11-2500	11-2500	—	11-2500	11-2500	11-2500	11-2500	—	—	11-2500	11-2500
RE21-11-7971	21-614229	9–10	SOIL	11-2500	11-2500	—	—	11-2500	11-2500	—	11-2500	11-2500	11-2500	11-2500	—	11-2500	11-2500	11-2500	11-2500	—	—	11-2500	11-2500
RE21-11-7972	21-614230	7–8	QBT3	11-2536	11-2536	—	—	11-2536	11-2536	—	11-2536	11-2536	11-2536	11-2536	—	11-2536	11-2536	11-2536	11-2536	—	—	11-2536	11-2536
RE21-11-7973	21-614230	9–10	QBT3	11-2536	11-2536	—	—	11-2536	11-2536	—	11-2536	11-2536	11-2536	11-2536	—	11-2536	11-2536	11-2536	11-2536	—	—	11-2536	11-2536
RE21-11-7974	21-614231	1–2	QBT3	11-2203	11-2201	—	—	11-2203	11-2203	—	11-2203	11-2203	11-2203	11-2201	—	11-2201	11-2203	11-2200	11-2203	—	—	11-2200	11-2201
RE21-11-7975	21-614231	3–4	QBT3	11-2203	11-2201	—	—	11-2203	11-2203	—	11-2203	11-2203	11-2203	11-2201	—	11-2201	11-2203	11-2200	11-2203	—	—	11-2200	11-2201
RE21-11-7976	21-614232	1–2	QBT3	11-2203	11-2201	—	—	11-2203	11-2203	—	11-2203	11-2203	11-2203	11-2201	—	11-2201	11-2203	11-2200	11-2203	—	—	11-2200	11-2201
RE21-11-7977	21-614232	3–4	QBT3	11-2203	11-2201	—	—	11-2203	11-2203	—	11-2203	11-2203	11-2203	11-2201	—	11-2201	11-2203	11-2200	11-2203	—	—	11-2200	11-2201
RE21-11-7978	21-614233	4–5	SOIL	11-2243	11-2241	—	—	11-2243	11-2243	—	11-2243	11-2243	11-2243	11-2241	—	11-2241	11-2243	11-2240	11-2243	—	—	11-2240	11-2241
RE21-11-7979	21-614233	6–7	QBT3	11-2243	11-2241	—	—	11-2243	11-2243	—	11-2243	11-2243	11-2243	11-2241	—	11-2241	11-2243	11-2240	11-2243	—	—	11-2240	11-2241
RE21-11-7980	21-614234	4–5	SOIL	11-2272	11-2272	—	—	11-2272	11-2272	—	11-2272	11-2272	11-2272	11-2272	—	11-2272	11-2272	11-2272	11-2272	—	—	11-2272	11-2272
RE21-11-7981	21-614234	6–7	QBT3	11-2357	11-2357	—	—	11-2357	11-2357	—	11-2357	11-2357	11-2357	11-2357	—	11-2357	11-2357	11-2357	11-2357	—	—	11-2357	11-2357
RE21-11-7982	21-614235	0.5–1.5	SOIL	11-2225	11-2223	11-2224	—	11-2225	11-2225	—	11-2225	11-2225	11-2225	11-2223	—	11-2223	11-2225	—	11-2225	—	—	—	11-2223
RE21-11-7983	21-614235	2.5–3.5	SOIL	11-2225	11-2223	11-2224	—	11-2225	11-2225	—	11-2225	11-2225	11-2225	11-2223	—	11-2223	11-2225	—	11-2225	—	—	—	11-2223
RE21-11-7984	21-614236	0.5–1.5	SOIL	11-2225	11-2223	11-2224	—	11-2225	11-2225	—	11-2225	11-2225	11-2225	11-2223	—	11-2223	11-2225	—	11-2225	—	—	—	11-2223
RE21-11-7985	21-614236	2.5–3.5	QBT3	11-2225	11-2223	11-2224	—	11-2225	11-2225	—	11-2225	11-2225	11-2225	11-2223	—	11-2223	11-2225	—	11-2225	—	—	—	11-2223
RE21-11-7986	21-614237	0–1	QBT3	11-2225	11-2223	11-2224	—	11-2225	11-2225	—	11-2225	11-2225	11-2225	11-2223	—	11-2223	11-2225	—	11-2225	—	—	—	11-2223
RE21-11-7987	21-614237	2–3	QBT3	11-2225	11-2223	11-2224	—	11-2225	11-2225	—	11-2225	11-2225	11-2225	11-2223	—	11-2223	11-2225	—	11-2225	—	—	—	11-2223
RE21-11-7988	21-614238	5–6	QBT3	11-2341	11-2338	—	—	11-2341	11-2341	—	11-2341	11-2341	11-2341	11-2338	—	11-2338	11-2341	—	11-2341	—	—	—	11-2338
RE21-11-7989	21-614238	9–10	QBT3	11-2341	11-2338	—	—	11-2341	11-2341	—	11-2341	11-2341	11-2341	11-2338	—	11-2338	11-2341	—	11-2341	—	—	—	11-2338
RE21-11-7990	21-614238	14–15	QBT3	11-2341	11-2338	—	—	11-2341	11-2341	—	11-2341	11-2341	11-2341	11-2338	—	11-2338	11-2341	—	11-2341	—	—	—	11-2338
RE21-11-7991	21-614239	5–6	SOIL	11-2341	11-2338	—	—	11-2341	11-2341	—	11-2341	11-2341	11-2341	11-2338	—	11-2338	11-2341	—	11-2341	—	—	—	11-2338
RE21-11-7992	21-614239	9–10	QBT3	11-2341	11-2338	—	—	11-2341	11-2341	—	11-2341	11-2341	11-2341	11-2338	—	11-2338	11-2341	—	11-2341	—	—	—	11-2338
RE21-11-7993	21-614239	14–15	QBT3	11-2341	11-2338	—	—	11-2341	11-2341	—	11-2341	11-2341	11-2341	11-2338	—	11-2338	11-2341	—	11-2341	—	—	—	11-2338
RE21-11-7994	21-614240	5–6	QBT3	11-2357	11-2357	—	—	11-2357	11-2357	—	11-2357	11-2357	11-2357	11-2357	—	11-2357	11-2357	—	11-2357	—	—	—	11-2357
RE21-11-7995	21-614240	9–10	QBT3	11-2385	11-2385	—	—	11-2385	11-2385	—	11-2385	11-2385	11-2385	11-2385	—	11-2385	11-2385	—	11-2385	—	—	—	11-2385
RE21-11-7996	21-614240	14–15	QBT3	11-2385	11-2385	—	—	11-2385	11-2385	—	11-2385	11-2385	11-2385	11-2385	—	11-2385	11-2385	—	11-2385	—	—	—	11-2385

*— = Analysis not requested.

Table 7.1-10
Inorganic Chemicals above BVs at Former Building 21-152 and Associated Former Structures Footprints

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14500**	**11.2**
Soil BV[a]				**29200**	**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**
Construction Worker SSL[b]				**40700**	**124**	**4350**	**144**	**309**	**na[c]**	**449[d]**	**34.6[e]**	**12400**	**6190**	**217000**	**800**
Industrial SSL[b]				**1130000**	**454**	**224000**	**2260**	**1120**	**na**	**292[d]**	**300[f]**	**45400**	**22700**	**795000**	**800**
Residential SSL[b]				**78100**	**31.3**	**15600**	**156**	**77.9**	**na**	**219[d]**	**23[f]**	**3130**	**1560**	**54800**	**400**
RE21-11-7849	21-614182	6–7	QBT3	—[g]	0.672 (U)	—	—	—	—	12.1	—	12.6 (J)	—	—	—
RE21-11-7850	21-614182	8–9	QBT3	—	—	—	—	—	—	7.94	—	—	—	—	—
RE21-11-7851	21-614183	6–7	QBT3	—	1.44 (U)	—	—	—	2280	—	—	—	—	—	—
RE21-11-7852	21-614183	8–9	QBT3	—	1.77 (U)	—	—	—	3170	7.26	—	4.9	—	—	—
RE21-11-7853	21-614184	6–7	QBT3	—	1.37	—	—	—	—	—	—	—	—	—	—
RE21-11-7854	21-614184	8–9	QBT3	—	0.944 (J)	—	—	—	—	—	—	5.76	—	—	—
RE21-11-7855	21-614185	6–7	QBT3	—	0.797 (J)	—	—	—	—	—	—	—	—	—	—
RE21-11-7856	21-614185	8–9	QBT3	—	0.898 (J)	—	—	—	—	—	—	—	—	—	—
RE21-11-7857	21-614186	6–7	QBT3	—	0.624 (J)	—	—	—	—	—	—	—	—	—	—
RE21-11-7858	21-614186	8–9	QBT3	—	0.961 (J)	—	—	—	—	—	—	—	—	—	—
RE21-11-7859	21-614187	6–7	SOIL	—	—	—	—	0.606 (U)	—	—	—	—	—	—	—
RE21-11-7860	21-614187	8–9	QBT3	7520	1.14 (J)	79.4	—	—	—	7.77	—	—	—	—	—
RE21-11-7861	21-614188	6–7	QBT3	—	2.22 (U)	52.2	—	—	4130	—	—	—	—	—	—
RE21-11-7862	21-614188	8–9	QBT3	—	0.876 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7863	21-614189	6–7	SOIL	—	1.9 (U)	—	—	0.574 (U)	—	—	—	—	—	—	—
RE21-11-7864	21-614189	8–9	QBT3	—	0.919 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7865	21-614190	6–7	QBT3	—	1.39 (U)	112	—	—	4070	15.4	—	10.4	—	—	14.3
RE21-11-7866	21-614190	8–9	QBT3	—	0.641 (U)	—	—	—	3640	37.2	—	7.1	—	—	—
RE21-11-7867	21-614191	6–7	QBT3	—	—	74.5	—	—	3580	32.2	—	6.93	—	—	—
RE21-11-7868	21-614191	8–9	QBT3	—	1.13 (U)	—	—	—	2220	19.3	—	—	—	—	—
RE21-11-7869	21-614192	6–7	SOIL	—	—	—	—	0.557 (U)	—	—	—	—	—	—	—
RE21-11-7870	21-614192	8–9	QBT3	17800	0.802 (U)	157	1.52	—	3910	16.8	5.1	11.6	—	16300	19.8
RE21-11-7871	21-614193	6–7	QBT3	NA[h]	1.09 (U)	66.4 (J-)	—	—	—	—	3.84	12.1	—	—	245
RE21-11-7872	21-614193	8–9	QBT3	NA	1.12 (U)	—	—	—	—	—	—	—	—	—	18.5
RE21-11-7873	21-614194	6–7	QBT3	—	0.647 (U)	—	—	—	—	—	—	6.66	—	—	—
RE21-11-7874	21-614194	8–9	QBT3	—	1.14 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7875	21-614195	6–7	QBT3	—	0.501 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7876	21-614195	8–9	QBT3	—	0.719 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7877	21-614196	6–7	QBT3	—	0.992 (U)	—	—	—	—	8.45	—	—	—	—	—
RE21-11-7878	21-614196	8–9	QBT3	—	0.571 (U)	—	—	—	—	15.5	—	—	—	—	—

Table 7.1-10 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14500**	**11.2**
Soil BV[a]				**29200**	**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**
Construction Worker SSL[b]				**40700**	**124**	**4350**	**144**	**309**	**na[c]**	**449[d]**	**34.6[e]**	**12400**	**6190**	**217000**	**800**
Industrial SSL[b]				**1130000**	**454**	**224000**	**2260**	**1120**	**na**	**292[d]**	**300[f]**	**45400**	**22700**	**795000**	**800**
Residential SSL[b]				**78100**	**31.3**	**15600**	**156**	**77.9**	**na**	**219[d]**	**23[f]**	**3130**	**1560**	**54800**	**400**
RE21-11-7879	21-614197	6–7	QBT3	—	1.16 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7880	21-614197	8–9	QBT3	—	1.07 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7881	21-614198	6–7	QBT3	—	1.1 (U)	49.4	—	—	2920	13.5 (J)	—	—	—	—	—
RE21-11-7882	21-614198	8–9	QBT3	—	1.09 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7883	21-614199	6–7	QBT3	—	1.12 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7884	21-614199	8–9	QBT3	—	1.1 (U)	—	—	—	—	—	—	—	—	—	15.5
RE21-11-7885	21-614200	6–7	QBT3	—	0.997 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7886	21-614200	8–9	QBT3	—	1.06 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7887	21-614201	6–7	QBT3	—	1.35 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7888	21-614201	8–9	QBT3	—	1.05 (U)	—	—	—	—	—	—	4.95 (J)	—	—	—
RE21-11-7889	21-614202	6–7	QBT3	—	1.55 (U)	65.1 (J)	—	—	3920	15.6	—	8.13 (J)	—	—	—
RE21-11-7890	21-614202	8–9	QBT3	—	0.78 (U)	—	—	—	—	10.2	—	—	—	—	—
RE21-11-7891	21-614203	6–7	QBT3	—	1.72 (U)	127 (J)	—	—	13500	—	—	5.93 (J)	—	—	—
RE21-11-7892	21-614203	8–9	QBT3	—	0.76 (U)	69 (J)	—	—	—	29	—	—	—	—	—
RE21-11-7893	21-614204	6–7	QBT3	—	1.05 (U)	—	—	—	—	9.74	—	7.09 (J)	—	—	—
RE21-11-7894	21-614204	8–9	QBT3	—	1.08 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7895	21-614205	6–7	QBT3	—	1.02 (U)	—	—	—	—	10	—	6.94 (J)	—	—	—
RE21-11-7896	21-614205	8–9	QBT3	—	—	—	—	—	—	—	—	6.05 (J)	—	—	—
RE21-11-7897	21-614206	6–7	QBT3	—	1.06 (U)	49	—	—	—	—	—	—	—	—	—
RE21-11-7898	21-614206	8–9	QBT3	13900 (J+)	1.81 (U)	243	—	—	—	13.3	—	9.43	—	—	—
RE21-11-7899	21-614207	6–7	QBT3	—	—	—	—	—	4740	41.1	—	6.23	—	—	—
RE21-11-7900	21-614207	8–9	QBT3	—	1.12 (U)	—	—	—	—	23.7	—	5.38	—	—	—
RE21-11-7901	21-614208	6–7	QBT3	NA	1.19 (U)	119 (J-)	—	—	2770 (J)	—	—	5.24	—	—	—
RE21-11-7902	21-614208	8–9	QBT3	NA	1.14 (U)	57.5 (J-)	—	—	—	—	—	—	—	—	—
RE21-11-7903	21-614209	6–7	QBT3	—	0.586 (U)	—	—	—	—	8.13	—	—	—	—	—
RE21-11-7904	21-614209	8–9	QBT3	—	0.559 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7905	21-614210	1–2	SOIL	—	1.02 (U)	—	—	0.51 (U)	9220	—	—	—	—	—	—
RE21-11-7906	21-614210	3–4	QBT3	—	1.05 (U)	—	—	—	—	21	—	7.42	—	—	—
RE21-11-7907	21-614211	1–2	SOIL	—	1.06 (U)	—	—	0.53 (U)	13900	—	—	—	—	—	—
RE21-11-7908	21-614211	3–4	QBT3	9460	—	117	—	—	2680	16.8	—	7.95	—	—	—
RE21-11-7909	21-614212	1–2	SOIL	—	1.06 (U)	—	—	0.531 (U)	17300 (J)	—	—	—	0.849	—	—
RE21-11-7910	21-614212	3–4	QBT3	—	1.03 (U)	59.1	—	—	—	19	—	—	—	—	—

Table 7.1-10 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14500**	**11.2**
Soil BV[a]				**29200**	**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**
Construction Worker SSL[b]				**40700**	**124**	**4350**	**144**	**309**	**na[c]**	**449[d]**	**34.6[e]**	**12400**	**6190**	**217000**	**800**
Industrial SSL[b]				**1130000**	**454**	**224000**	**2260**	**1120**	**na**	**292[d]**	**300[f]**	**45400**	**22700**	**795000**	**800**
Residential SSL[b]				**78100**	**31.3**	**15600**	**156**	**77.9**	**na**	**219[d]**	**23[f]**	**3130**	**1560**	**54800**	**400**
RE21-11-7911	21-614213	1–2	SOIL	—	—	—	—	0.53 (U)	—	—	—	—	—	—	—
RE21-11-7912	21-614213	3–4	QBT3	9910	—	49.8	—	—	—	7.31	—	—	—	—	—
RE21-11-7913	21-614214	1–2	SOIL	—	—	—	—	0.492 (U)	11900	—	—	—	—	—	—
RE21-11-7914	21-614214	3–4	SOIL	—	—	—	—	0.545 (U)	—	—	—	—	—	—	—
RE21-11-7915	21-614215	1–2	SOIL	—	2.41 (U)	—	—	0.487 (U)	6670	—	—	—	—	—	—
RE21-11-7916	21-614215	3–4	QBT3	—	0.636 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7917	21-614216	1–2	SOIL	—	1.51 (U)	—	—	0.53 (U)	—	—	—	—	—	—	—
RE21-11-7918	21-614216	3–4	QBT3	12300 (J+)	1.08 (U)	131 (J)	—	—	3640	7.89	4.33	5.66	0.622	—	12.6
RE21-11-7919	21-614217	1–2	SOIL	—	1.25 (U)	—	—	0.523 (U)	—	—	—	—	—	—	—
RE21-11-7920	21-614217	3–4	SOIL	—	1.4 (U)	314 (J+)	—	0.545 (U)	—	—	—	—	—	—	—
RE21-11-7921	21-614218	1–2	SOIL	—	1.47 (U)	—	—	0.508 (U)	—	—	—	—	—	—	—
RE21-11-7922	21-614218	3–4	SOIL	—	1.57 (U)	—	—	0.576 (U)	—	—	—	—	—	—	—
RE21-11-7923	21-614219	1–2	SOIL	—	1 (U)	—	—	0.502 (U)	17100 (J-)	—	—	—	—	—	—
RE21-11-7924	21-614219	3–4	QBT3	—	1.12 (U)	136	—	—	2480 (J-)	—	—	—	—	—	—
RE21-11-7925	21-614220	1–2	SOIL	—	—	—	—	0.515 (U)	21000 (J)	—	—	—	—	—	—
RE21-11-7926	21-614220	3–4	QBT3	—	1 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7927	21-614221	1–2	SOIL	—	1.61 (U)	—	—	0.533 (U)	—	—	—	—	—	—	—
RE21-11-7928	21-614221	3–4	SOIL	—	1.48 (U)	486 (J+)	—	0.557 (U)	8550	—	9.7	—	—	—	—
RE21-11-7933	21-614222	1–2	SOIL	—	1.02 (U)	—	—	0.508 (U)	6520	—	—	—	—	—	—
RE21-11-7934	21-614222	3–4	QBT3	—	1.12 (U)	—	—	—	2650	—	—	—	—	—	—
RE21-11-7997	21-614222	5–6	QBT3	—	4.2	—	—	—	19700	7.77	—	8.74	—	—	19.9
RE21-11-7936	21-614223	1–2	SOIL	—	1.07 (U)	—	—	0.534 (U)	—	—	—	—	—	—	—
RE21-11-7937	21-614223	3–4	QBT3	—	1.07 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7938	21-614223	5–6	QBT3	—	1.06 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7939	21-614224	1–2	QBT3	—	0.904 (U)	72.4 (J+)	—	—	—	—	—	—	—	—	—
RE21-11-7940	21-614224	3–4	QBT3	—	1.1 (U)	—	—	—	—	8.09	—	—	—	—	—
RE21-11-7941	21-614225	4–5	SOIL	—	1.02 (U)	—	—	0.508 (U)	16100	26.9	—	—	—	—	—
RE21-11-7942	21-614225	6–7	SOIL	—	1.81 (U)	—	—	—	—	—	—	29.7	0.837	—	31.8
RE21-11-7963	21-614226	1–2	SOIL	—	1.01 (U)	—	—	0.507 (U)	15900	—	—	—	—	—	—
RE21-11-7964	21-614226	3–4	SOIL	—	—	—	—	0.515 (U)	—	—	—	—	—	—	—
RE21-11-7965	21-614226	5–6	QBT3	—	1.08 (U)	64.8	—	—	3060	17.9	—	7.11	—	—	20.5
RE21-11-7966	21-614227	2–3	SOIL	—	1.07 (UJ)	—	—	0.534 (U)	—	—	—	—	—	—	23.3

Table 7.1-10 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14500**	**11.2**
Soil BV[a]				**29200**	**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**
Construction Worker SSL[b]				**40700**	**124**	**4350**	**144**	**309**	**na[c]**	**449[d]**	**34.6[e]**	**12400**	**6190**	**217000**	**800**
Industrial SSL[b]				**1130000**	**454**	**224000**	**2260**	**1120**	**na**	**292[d]**	**300[f]**	**45400**	**22700**	**795000**	**800**
Residential SSL[b]				**78100**	**31.3**	**15600**	**156**	**77.9**	**na**	**219[d]**	**23[f]**	**3130**	**1560**	**54800**	**400**
RE21-11-7967	21-614227	4–5	QBT3	—	1.03 (UJ)	—	—	—	—	—	—	—	—	—	—
RE21-11-7968	21-614228	7–8	SOIL	—	1.4	—	—	0.506 (U)	—	28 (J)	—	—	—	—	—
RE21-11-7969	21-614228	9–10	QBT3	—	1.05 (U)	—	—	—	—	16.5 (J)	—	8.97 (J)	—	—	—
RE21-11-7970	21-614229	7–8	SOIL	—	1.54	—	—	0.499 (U)	—	38.6	—	—	—	—	—
RE21-11-7971	21-614229	9–10	SOIL	—	1.5	—	—	0.523 (U)	7000	22.3	—	—	—	—	—
RE21-11-7972	21-614230	7–8	QBT3	—	1.1 (U)	—	—	—	—	17.2	—	—	—	—	—
RE21-11-7973	21-614230	9–10	QBT3	—	1.1 (U)	—	—	—	—	7.97	—	—	—	—	—
RE21-11-7974	21-614231	1–2	QBT3	—	1.06 (U)	53.6 (J+)	—	—	6490	—	—	5.68	—	—	—
RE21-11-7975	21-614231	3–4	QBT3	—	1.1 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7976	21-614232	1–2	QBT3	—	—	54.9 (J+)	—	—	3360	—	—	—	—	—	—
RE21-11-7977	21-614232	3–4	QBT3	—	1.09 (U)	84.5 (J+)	—	—	6130	—	—	5.67	—	—	2270
RE21-11-7978	21-614233	4–5	SOIL	—	1.14 (U)	—	—	0.569 (U)	7360 (J-)	20.4	—	—	—	—	—
RE21-11-7979	21-614233	6–7	QBT3	—	1.08 (U)	76.5	—	—	2420 (J-)	7.87	—	5.82	—	—	—
RE21-11-7980	21-614234	4–5	SOIL	—	1.1 (U)	—	—	0.548 (U)	12200	—	—	—	—	—	—
RE21-11-7981	21-614234	6–7	QBT3	—	0.781 (U)	73.1	—	—	4690 (J+)	—	—	6.27	—	—	17.3
RE21-11-7982	21-614235	0.5–1.5	SOIL	—	1.11 (U)	—	—	0.555 (U)	—	—	—	—	—	—	—
RE21-11-7983	21-614235	2.5–3.5	SOIL	—	1.09 (U)	—	—	0.546 (U)	—	—	—	—	—	—	—
RE21-11-7984	21-614236	0.5–1.5	SOIL	—	—	—	—	0.54 (U)	—	—	—	—	—	—	—
RE21-11-7985	21-614236	2.5–3.5	QBT3	10300	1.16 (U)	155	2.61	—	5990	14.1	8.28	7.39	—	—	13.5
RE21-11-7986	21-614237	0–1	QBT3	—	0.989 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7987	21-614237	2–3	QBT3	—	1.09 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7988	21-614238	5–6	QBT3	—	0.979 (U)	—	—	—	—	—	—	5.03 (J)	—	—	—
RE21-11-7989	21-614238	9–10	QBT3	—	0.545 (U)	—	—	—	—	7.33	—	—	—	—	—
RE21-11-7990	21-614238	14–15	QBT3	—	0.76 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7991	21-614239	5–6	SOIL	—	2 (U)	—	—	—	7020	—	—	—	—	—	—
RE21-11-7992	21-614239	9–10	QBT3	—	—	—	—	—	—	—	—	—	0.767	—	—
RE21-11-7993	21-614239	14–15	QBT3	—	1.03 (U)	—	—	—	—	—	—	—	—	—	—
RE21-11-7994	21-614240	5–6	QBT3	—	1.14 (U)	—	—	—	-	8.16	—	—	—	—	—
RE21-11-7995	21-614240	9–10	QBT3	—	—	—	—	—	—	—	—	6.58 (J)	—	—	—
RE21-11-7996	21-614240	14–15	QBT3	—	—	—	—	—	—	—	3.41	—	—	—	—

Table 7.1-10 (continued)

Sample ID	Location ID	Depth (ft)	Media	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt 2, 3, 4 BV[a]				**1690**	**482**	**0.1**	**6.58**	**na[c]**	**na**	**0.3**	**1**	**1.1**	**17**	**63.5**
Soil BV[a]				**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**0.73**	**39.6**	**48.8**
Construction Worker SSL[b]				**na**	**463**	**92.9[e]**	**6190**	**496000**	**217**	**1550**	**1550**	**20.4**	**1550**	**92900**
Industrial SSL[b]				**na**	**145000**	**310[f]**	**22700**	**1820000**	**795**	**5680**	**5680**	**74.9**	**5680**	**341000**
Residential SSL[b]				**na**	**10700**	**23[f]**	**1560**	**125000**	**54.8**	**391**	**391**	**5.16**	**391**	**23500**
RE21-11-7849	21-614182	6–7	QBT3	—	—	—	—	1.43	—	1.09 (UJ)	—	—	—	—
RE21-11-7850	21-614182	8–9	QBT3	—	—	—	—	1.54	—	1.05 (UJ)	—	—	—	—
RE21-11-7851	21-614183	6–7	QBT3	—	—	0.183 (J+)	—	2.8	—	0.992 (U)	—	—	—	—
RE21-11-7852	21-614183	8–9	QBT3	—	—	—	—	2.08	—	0.959 (U)	—	—	—	—
RE21-11-7853	21-614184	6–7	QBT3	—	—	0.355	—	1.46	—	1.12 (UJ)	—	—	—	—
RE21-11-7854	21-614184	8–9	QBT3	—	—	—	—	1.74	—	1.15 (UJ)	—	—	—	—
RE21-11-7855	21-614185	6–7	QBT3	—	—	—	—	1.38	—	1.08 (UJ)	—	—	—	—
RE21-11-7856	21-614185	8–9	QBT3	—	—	—	—	1.35	—	1.09 (UJ)	—	—	—	—
RE21-11-7857	21-614186	6–7	QBT3	—	—	—	—	2.08	—	1.09 (UJ)	—	—	—	—
RE21-11-7858	21-614186	8–9	QBT3	—	—	—	—	1.62	—	0.954 (UJ)	—	—	—	—
RE21-11-7859	21-614187	6–7	SOIL	—	—	0.103	—	2.54	—	—	—	—	—	—
RE21-11-7860	21-614187	8–9	QBT3	—	—	—	—	1.9	—	1.2 (UJ)	—	—	—	—
RE21-11-7861	21-614188	6–7	QBT3	—	—	0.249	—	5.75	0.00322	1.07 (U)	—	—	—	—
RE21-11-7862	21-614188	8–9	QBT3	—	—	—	—	3.98	0.000929 (J)	1.06 (U)	—	—	—	—
RE21-11-7863	21-614189	6–7	SOIL	—	—	1.61	—	4.47	0.00157 (J)	—	—	—	—	55.2
RE21-11-7864	21-614189	8–9	QBT3	—	—	0.362	—	2.53	—	1.14 (U)	—	—	—	—
RE21-11-7865	21-614190	6–7	QBT3	—	—	0.102	—	11.1	—	1.08 (UJ)	—	—	—	—
RE21-11-7866	21-614190	8–9	QBT3	—	—	—	—	5.78	—	1.08 (UJ)	—	—	—	—
RE21-11-7867	21-614191	6–7	QBT3	—	—	—	—	5.73	—	1.16 (UJ)	—	—	—	—
RE21-11-7868	21-614191	8–9	QBT3	—	—	—	8.2	4.09	—	1.17 (UJ)	—	—	—	—
RE21-11-7869	21-614192	6–7	SOIL	—	—	0.111	—	7.31	—	—	—	—	—	—
RE21-11-7870	21-614192	8–9	QBT3	3030 (J+)	540	—	11.5	2.07	—	1.08 (UJ)	—	—	19.9	—
RE21-11-7871	21-614193	6–7	QBT3	—	NA	—	—	4.68	—	1.08 (U)	—	3.25 (J)	—	172
RE21-11-7872	21-614193	8–9	QBT3	—	NA	—	—	4.14	—	1.11 (U)	—	—	—	—
RE21-11-7873	21-614194	6–7	QBT3	—	—	—	—	1.25	—	1.15 (U)	—	—	—	—
RE21-11-7874	21-614194	8–9	QBT3	—	584 (J+)	—	—	1.09 (J)	—	1.08 (U)	—	—	—	—
RE21-11-7875	21-614195	6–7	QBT3	—	—	—	—	1.15	—	1.12 (U)	—	—	—	—
RE21-11-7876	21-614195	8–9	QBT3	—	—	—	—	1.11 (J)	—	1.13 (U)	—	—	—	—
RE21-11-7877	21-614196	6–7	QBT3	—	—	—	—	1.47	0.000764 (J)	1.07 (U)	—	—	—	—
RE21-11-7878	21-614196	8–9	QBT3	—	—	—	—	1.25	—	1.11 (U)	—	—	—	—
RE21-11-7879	21-614197	6–7	QBT3	—	—	—	—	1.38	—	1.16 (U)	—	—	—	—

Table 7.1-10 (continued)

Sample ID	Location ID	Depth (ft)	Media	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt 2, 3, 4 BV[a]				**1690**	**482**	**0.1**	**6.58**	**na[c]**	**na**	**0.3**	**1**	**1.1**	**17**	**63.5**
Soil BV[a]				**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**0.73**	**39.6**	**48.8**
Construction Worker SSL[b]				**na**	**463**	**92.9[e]**	**6190**	**496000**	**217**	**1550**	**1550**	**20.4**	**1550**	**92900**
Industrial SSL[b]				**na**	**145000**	**310[f]**	**22700**	**1820000**	**795**	**5680**	**5680**	**74.9**	**5680**	**341000**
Residential SSL[b]				**na**	**10700**	**23[f]**	**1560**	**125000**	**54.8**	**391**	**391**	**5.16**	**391**	**23500**
RE21-11-7880	21-614197	8–9	QBT3	—	—	—	—	1.42	—	1.07 (U)	—	—	—	—
RE21-11-7881	21-614198	6–7	QBT3	—	—	—	—	1.68	—	1.04 (U)	—	—	—	—
RE21-11-7882	21-614198	8–9	QBT3	—	—	—	—	1.59	—	1.14 (U)	—	—	—	—
RE21-11-7883	21-614199	6–7	QBT3	—	—	—	—	1.63	—	1.1 (U)	—	—	—	—
RE21-11-7884	21-614199	8–9	QBT3	—	728	—	—	1.33	—	1.02 (U)	—	—	—	87.4
RE21-11-7885	21-614200	6–7	QBT3	—	—	—	—	1.28	—	1.03 (U)	—	—	—	—
RE21-11-7886	21-614200	8–9	QBT3	—	—	—	—	1.33	—	1.01 (U)	—	—	—	—
RE21-11-7887	21-614201	6–7	QBT3	—	—	—	—	1.62	—	1.06 (U)	2.65 (U)	—	—	—
RE21-11-7888	21-614201	8–9	QBT3	—	—	—	—	1.52	—	0.964 (U)	—	—	—	—
RE21-11-7889	21-614202	6–7	QBT3	—	—	—	—	4.9	—	1.07 (U)	—	—	—	—
RE21-11-7890	21-614202	8–9	QBT3	—	—	—	—	3.12	—	1.04 (U)	2.54 (U)	—	—	—
RE21-11-7891	21-614203	6–7	QBT3	1760 (J+)	—	—	—	2.45	—	1.04 (U)	—	—	17.6	—
RE21-11-7892	21-614203	8–9	QBT3	—	—	—	—	1.76	—	0.996 (U)	—	—	—	—
RE21-11-7893	21-614204	6–7	QBT3	—	—	—	—	1.16	—	1.05 (U)	—	—	—	—
RE21-11-7894	21-614204	8–9	QBT3	—	—	—	—	1.25	—	1.07 (U)	—	—	—	—
RE21-11-7895	21-614205	6–7	QBT3	—	—	—	—	1.35	—	1.1 (UJ)	—	—	—	—
RE21-11-7896	21-614205	8–9	QBT3	—	—	—	—	1.24	—	1.08 (UJ)	—	—	—	—
RE21-11-7897	21-614206	6–7	QBT3	—	—	0.106	—	5.64	0.00131 (J)	1.14 (U)	—	—	—	—
RE21-11-7898	21-614206	8–9	QBT3	—	—	0.104	—	5.5	—	1.17 (U)	—	—	—	—
RE21-11-7899	21-614207	6–7	QBT3	—	—	—	—	5.29	—	1.13 (UJ)	—	—	—	—
RE21-11-7900	21-614207	8–9	QBT3	—	—	—	—	3.3	—	1.14 (UJ)	—	—	—	—
RE21-11-7901	21-614208	6–7	QBT3	—	NA	—	—	1.36	—	1.2 (U)	—	—	—	—
RE21-11-7902	21-614208	8–9	QBT3	—	NA	—	—	1.32	—	1.12 (U)	—	—	—	—
RE21-11-7903	21-614209	6–7	QBT3	—	—	—	—	3.48	0.000733 (J)	1.09 (U)	2.56 (U)	—	—	—
RE21-11-7904	21-614209	8–9	QBT3	—	—	—	—	1.61	—	1.01 (U)	—	—	—	—
RE21-11-7905	21-614210	1–2	SOIL	—	—	—	—	2.91	0.00197 (J)	—	—	—	—	—
RE21-11-7906	21-614210	3–4	QBT3	—	—	—	—	4.08	0.00124 (J)	1.02 (UJ)	—	—	—	—
RE21-11-7907	21-614211	1–2	SOIL	—	—	—	—	2.24	0.00216	—	—	—	—	—
RE21-11-7908	21-614211	3–4	QBT3	—	—	—	7.29	3.94	0.00368	1.1 (UJ)	—	—	—	—
RE21-11-7909	21-614212	1–2	SOIL	—	—	0.144 (J+)	—	3.75	0.00191 (J)	—	—	—	—	—
RE21-11-7910	21-614212	3–4	QBT3	—	—	—	—	3.28	0.000862 (J)	1 (U)	—	—	—	—

Table 7.1-10 (continued)

Sample ID	Location ID	Depth (ft)	Media	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt 2, 3, 4 BV[a]				**1690**	**482**	**0.1**	**6.58**	**na[c]**	**na**	**0.3**	**1**	**1.1**	**17**	**63.5**
Soil BV[a]				**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**0.73**	**39.6**	**48.8**
Construction Worker SSL[b]				**na**	**463**	**92.9[e]**	**6190**	**496000**	**217**	**1550**	**1550**	**20.4**	**1550**	**92900**
Industrial SSL[b]				**na**	**145000**	**310[f]**	**22700**	**1820000**	**795**	**5680**	**5680**	**74.9**	**5680**	**341000**
Residential SSL[b]				**na**	**10700**	**23[f]**	**1560**	**125000**	**54.8**	**391**	**391**	**5.16**	**391**	**23500**
RE21-11-7911	21-614213	1–2	SOIL	—	—	—	—	7.31	0.00105 (J)	—	—	—	—	—
RE21-11-7912	21-614213	3–4	QBT3	—	—	—	—	4.63	0.000596 (J)	1.07 (U)	—	—	—	—
RE21-11-7913	21-614214	1–2	SOIL	—	—	2.85	—	4.86	0.00366	—	—	—	—	—
RE21-11-7914	21-614214	3–4	SOIL	—	—	—	—	10.5	—	—	—	—	—	—
RE21-11-7915	21-614215	1–2	SOIL	—	—	—	—	17.9	0.00144 (J)	—	—	—	—	—
RE21-11-7916	21-614215	3–4	QBT3	—	—	—	—	6.65	—	1.02 (U)	—	—	—	—
RE21-11-7917	21-614216	1–2	SOIL	—	—	—	—	19	0.00149 (J)	—	2.65 (U)	—	—	—
RE21-11-7918	21-614216	3–4	QBT3	2540 (J)	—	—	7.52	10.9	0.000775 (J)	1.01 (U)	2.8 (U)	—	18.2	—
RE21-11-7919	21-614217	1–2	SOIL	—	—	—	—	50.3	0.00118 (J)	—	—	—	—	—
RE21-11-7920	21-614217	3–4	SOIL	—	—	—	—	32.6	0.00158 (J)	—	—	—	—	—
RE21-11-7921	21-614218	1–2	SOIL	—	—	—	—	64	0.00172 (J)	—	—	—	—	—
RE21-11-7922	21-614218	3–4	SOIL	—	—	—	—	50.6	0.00123 (J)	—	—	—	—	—
RE21-11-7923	21-614219	1–2	SOIL	—	—	0.734	—	2.95	0.00115 (J)	—	—	—	—	70
RE21-11-7924	21-614219	3–4	QBT3	1880	—	—	—	7.64	—	1.13 (U)	—	—	—	—
RE21-11-7925	21-614220	1–2	SOIL	—	—	—	—	3.56	0.00167 (J)	—	—	—	—	—
RE21-11-7926	21-614220	3–4	QBT3	—	—	—	—	2.78	0.00123 (J)	1 (U)	—	—	—	—
RE21-11-7927	21-614221	1–2	SOIL	—	—	—	—	39	0.00149 (J)	—	—	—	—	—
RE21-11-7928	21-614221	3–4	SOIL	—	—	—	—	24.5	0.0012 (J)	—	—	—	—	—
RE21-11-7933	21-614222	1–2	SOIL	—	—	0.199	—	3.03	0.00261	—	—	—	—	76.5
RE21-11-7934	21-614222	3–4	QBT3	—	—	0.227	—	1.95	—	1.1 (UJ)	—	—	—	—
RE21-11-7997	21-614222	5–6	QBT3	—	—	—	—	—	—	1.12 (UJ)	—	—	—	98.5
RE21-11-7936	21-614223	1–2	SOIL	—	—	—	—	1.52	—	—	—	—	—	—
RE21-11-7937	21-614223	3–4	QBT3	—	—	—	—	1.7	—	1.03 (UJ)	—	—	—	—
RE21-11-7938	21-614223	5–6	QBT3	—	—	—	—	1.34	—	1.06 (UJ)	—	—	—	—
RE21-11-7939	21-614224	1–2	QBT3	—	—	—	—	1.21	—	1.11 (U)	—	—	—	—
RE21-11-7940	21-614224	3–4	QBT3	—	—	—	—	1.33	—	1.13 (UJ)	—	—	—	—
RE21-11-7941	21-614225	4–5	SOIL	—	—	—	—	1.48	0.00103 (J)	—	—	—	—	—
RE21-11-7942	21-614225	6–7	SOIL	—	—	0.645 (J+)	—	3.67	—	—	—	—	—	146
RE21-11-7963	21-614226	1–2	SOIL	—	—	—	—	2.46	0.0018 (J)	—	—	—	—	—
RE21-11-7964	21-614226	3–4	SOIL	—	—	—	—	2.02	—	—	—	—	—	—
RE21-11-7965	21-614226	5–6	QBT3	—	—	—	6.66	2.21	—	1.13 (UJ)	—	—	—	—

Table 7.1-10 (continued)

Sample ID	Location ID	Depth (ft)	Media	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt 2, 3, 4 BV[a]				**1690**	**482**	**0.1**	**6.58**	**na[c]**	**na**	**0.3**	**1**	**1.1**	**17**	**63.5**
Soil BV[a]				**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**0.73**	**39.6**	**48.8**
Construction Worker SSL[b]				**na**	**463**	**92.9[e]**	**6190**	**496000**	**217**	**1550**	**1550**	**20.4**	**1550**	**92900**
Industrial SSL[b]				**na**	**145000**	**310[f]**	**22700**	**1820000**	**795**	**5680**	**5680**	**74.9**	**5680**	**341000**
Residential SSL[b]				**na**	**10700**	**23[f]**	**1560**	**125000**	**54.8**	**391**	**391**	**5.16**	**391**	**23500**
RE21-11-7966	21-614227	2–3	SOIL	—	—	0.341	—	2.92	—	—	—	—	—	51.1
RE21-11-7967	21-614227	4–5	QBT3	—	—	—	—	3.1	—	0.991 (U)	—	—	—	—
RE21-11-7968	21-614228	7–8	SOIL	—	—	—	—	1.42	—	—	—	—	—	—
RE21-11-7969	21-614228	9–10	QBT3	—	—	—	—	2.04	—	1.12 (UJ)	—	—	—	—
RE21-11-7970	21-614229	7–8	SOIL	—	—	—	—	3.08	0.0006 (J)	—	—	—	—	58.3
RE21-11-7971	21-614229	9–10	SOIL	—	—	0.192	—	2.16	0.000702 (J)	—	—	—	—	61.8
RE21-11-7972	21-614230	7–8	QBT3	—	—	—	—	1.34	—	0.995 (UJ)	—	—	—	—
RE21-11-7973	21-614230	9–10	QBT3	—	—	—	—	1.26	—	1.09 (UJ)	—	—	—	—
RE21-11-7974	21-614231	1–2	QBT3	—	—	—	—	1.69	—	1.02 (UJ)	—	—	—	—
RE21-11-7975	21-614231	3–4	QBT3	—	—	—	—	1.9	—	1.07 (UJ)	—	—	—	—
RE21-11-7976	21-614232	1–2	QBT3	—	—	—	—	2.23	—	1.06 (UJ)	—	—	—	—
RE21-11-7977	21-614232	3–4	QBT3	—	—	—	—	2.26	—	1.07 (UJ)	—	—	—	—
RE21-11-7978	21-614233	4–5	SOIL	—	—	—	—	1.54	—	—	—	—	—	—
RE21-11-7979	21-614233	6–7	QBT3	—	—	—	—	1.71	—	1.06 (U)	—	—	—	—
RE21-11-7980	21-614234	4–5	SOIL	—	—	—	—	—	0.000583 (J)	—	—	—	—	56.8
RE21-11-7981	21-614234	6–7	QBT3	—	—	—	—	3.11	—	1.05 (U)	—	—	—	—
RE21-11-7982	21-614235	0.5–1.5	SOIL	—	—	—	—	3	—	—	—	—	—	—
RE21-11-7983	21-614235	2.5–3.5	SOIL	—	—	—	—	9.87	—	—	—	—	—	—
RE21-11-7984	21-614236	0.5–1.5	SOIL	—	—	—	—	6.28	—	—	—	—	—	—
RE21-11-7985	21-614236	2.5–3.5	QBT3	2750 (J+)	496	—	14.2	3.34	—	1.15 (UJ)	—	—	18.2	—
RE21-11-7986	21-614237	0–1	QBT3	—	—	—	—	1.87	—	1.08 (UJ)	—	—	—	—
RE21-11-7987	21-614237	2–3	QBT3	—	—	—	—	1.55	—	1.05 (UJ)	—	—	—	—
RE21-11-7988	21-614238	5–6	QBT3	—	—	—	—	1.31	—	1.11 (U)	—	—	—	—
RE21-11-7989	21-614238	9–10	QBT3	—	—	—	—	1.24	—	0.998 (U)	2.31 (U)	—	—	—
RE21-11-7990	21-614238	14–15	QBT3	—	—	—	—	1.16	—	0.979 (U)	2.5 (U)	—	—	—
RE21-11-7991	21-614239	5–6	SOIL	—	—	0.12 (J+)	—	—	—	—	—	—	—	—
RE21-11-7992	21-614239	9–10	QBT3	—	—	—	—	—	—	1.09 (U)	—	—	—	—
RE21-11-7993	21-614239	14–15	QBT3	—	—	—	—	—	—	1.07 (U)	—	—	—	—
RE21-11-7994	21-614240	5–6	QBT3	—	—	—	—	1.53	—	1.1 (U)	—	—	—	—

Table 7.1-10 (continued)

Sample ID	Location ID	Depth (ft)	Media	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt 2, 3, 4 BV[a]				**1690**	**482**	**0.1**	**6.58**	**na[c]**	**na**	**0.3**	**1**	**1.1**	**17**	**63.5**
Soil BV[a]				**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**0.73**	**39.6**	**48.8**
Construction Worker SSL[b]				**na**	**463**	**92.9[e]**	**6190**	**496000**	**217**	**1550**	**1550**	**20.4**	**1550**	**92900**
Industrial SSL[b]				**na**	**145000**	**310[f]**	**22700**	**1820000**	**795**	**5680**	**5680**	**74.9**	**5680**	**341000**
Residential SSL[b]				**na**	**10700**	**23[f]**	**1560**	**125000**	**54.8**	**391**	**391**	**5.16**	**391**	**23500**
RE21-11-7995	21-614240	9–10	QBT3	—	—	—	—	1.55	—	1.08 (U)	—	—	—	—
RE21-11-7996	21-614240	14–15	QBT3	—	—	—	—	1.37	—	0.407 (J)	—	—	—	—

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

[a] BVs are from LANL (1998, 059730).

[b] SSLs are from NMED (2009, 108070) unless otherwise noted.

[c] na = Not available.

[d] SSLs are for hexavalent chromium.

[e] Construction Worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2009, 108070).

[f] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[g] — = Not detected or not detected above BV.

[h] NA = Not analyzed.

Table 7.1-11
Organic Chemicals Detected at Former Building 21-152 and Associated Former Structures Footprints

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
Construction Worker SSL[a]				**18600**	**263000**	**66800**	**7.58**	**4.36**	**75.8**	**213**	**21.3**	**213**	**6680[b]**	**2060**
Industrial SSL[a]				**36700**	**851000**	**183000**	**8.26**	**8.26**	**8.26**	**23.4**	**2.34**	**23.4**	**18300[b]**	**234**
Residential SSL[a]				**3440**	**67500**	**17200**	**2.22**	**1.12**	**2.22**	**6.21**	**0.621**	**6.21**	**1720[b]**	**62.1**
RE21-11-7843	21-614180	1–2	SOIL	0.0258 (J)	—[c]	0.0672	NA[d]	NA	NA	0.479	0.45	0.696	0.263	0.29
RE21-11-7844	21-614180	3–4	QBT3	—	—	—	NA	NA	NA	0.0185 (J)	0.022 (J)	0.0228 (J)	0.0263 (J)	—
RE21-11-7846	21-614181	1–2	SOIL	—	—	0.0224 (J)	NA	NA	NA	0.0991	0.133	0.157	0.0714	0.0334 (J)
RE21-11-7847	21-614181	3–4	QBT3	—	—	—	NA	NA	NA	—	—	—	—	—
RE21-11-7851	21-614183	6–7	QBT3	—	—	0.0328 (J)	NA	NA	NA	0.0836	0.0952	0.0945	0.0573 (J)	0.0361 (J)
RE21-11-7852	21-614183	8–9	QBT3	0.0162 (J)	—	0.0338 (J)	NA	NA	NA	0.0518	0.0594	0.0494	0.0355 (J)	-
RE21-11-7853	21-614184	6–7	QBT3	—	—	0.0137 (J)	NA	NA	NA	0.0697	0.061	0.0724	0.0411	0.0301 (J)
RE21-11-7854	21-614184	8–9	QBT3	—	—	—	NA	NA	NA	—	—	—	—	—
RE21-11-7855	21-614185	6–7	QBT3	—	—	—	NA	NA	NA	0.0145 (J)	0.012 (J)	0.012 (J)	—	—
RE21-11-7856	21-614185	8–9	QBT3	—	—	—	NA	NA	NA	0.012 (J)	—	—	—	—
RE21-11-7857	21-614186	6–7	QBT3	0.1	—	0.165	NA	NA	NA	0.161	0.129	0.149	0.0839	0.0685
RE21-11-7858	21-614186	8–9	QBT3	—	—	0.0182 (J)	NA	NA	NA	0.0284 (J)	0.0244 (J)	0.0273 (J)	0.0197 (J)	0.0124 (J)
RE21-11-7859	21-614187	6–7	SOIL	—	—	—	NA	NA	NA	0.0139 (J)	—	—	—	—
RE21-11-7860	21-614187	8–9	QBT3	—	—	0.0284 (J)	NA	NA	NA	0.0337 (J)	0.0263 (J)	0.0308 (J)	0.0218 (J)	0.0127 (J)
RE21-11-7861	21-614188	6–7	QBT3	—	—	—	NA	NA	NA	0.0172 (J)	—	0.0124 (J)	—	—
RE21-11-7863	21-614189	6–7	SOIL	0.0407	0.00825 (J)	0.0773	NA	NA	NA	0.111	0.0825	0.105	0.0585	0.0423
RE21-11-7864	21-614189	8–9	QBT3	—	0.00347 (J)	—	NA	NA	NA	—	—	—	—	—
RE21-11-7865	21-614190	6–7	QBT3	—	—	—	NA	NA	NA	—	—	—	—	—
RE21-11-7866	21-614190	8–9	QBT3	—	—	—	NA	NA	NA	—	—	—	—	—
RE21-11-7871	21-614193	6–7	QBT3	—	—	—	NA	NA	NA	—	—	—	—	—
RE21-11-7872	21-614193	8–9	QBT3	—	—	—	NA	NA	NA	—	—	—	—	—
RE21-11-7873	21-614194	6–7	QBT3	—	—	—	NA	NA	NA	—	—	—	—	—
RE21-11-7875	21-614195	6–7	QBT3	—	0.00393 (J)	—	NA	NA	NA	—	—	—	—	—
RE21-11-7876	21-614195	8–9	QBT3	—	0.00479 (J)	—	NA	NA	NA	—	—	—	—	—
RE21-11-7877	21-614196	6–7	QBT3	0.0166 (J)	0.00206 (J)	0.0303 (J)	NA	NA	NA	0.0638	0.0568	0.0613	0.0251 (J)	0.028 (J)
RE21-11-7878	21-614196	8–9	QBT3	—	0.00201 (J)	—	NA	NA	NA	0.0456	0.0267 (J)	0.0386	—	—
RE21-11-7880	21-614197	8–9	QBT3	—	0.0041 (J)	—	NA	NA	NA	—	—	—	—	—
RE21-11-7881	21-614198	6–7	QBT3	—	—	0.0222 (J)	NA	NA	NA	0.0997	0.12	0.158	0.0481 (J)	0.0474
RE21-11-7882	21-614198	8–9	QBT3	—	—	—	NA	NA	NA	0.0163 (J)	—	0.0159 (J)	—	—

Table 7.1-11 (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
Construction Worker SSL[a]				**18600**	**263000**	**66800**	**7.58**	**4.36**	**75.8**	**213**	**21.3**	**213**	**6680[b]**	**2060**
Industrial SSL[a]				**36700**	**851000**	**183000**	**8.26**	**8.26**	**8.26**	**23.4**	**2.34**	**23.4**	**18300[b]**	**234**
Residential SSL[a]				**3440**	**67500**	**17200**	**2.22**	**1.12**	**2.22**	**6.21**	**0.621**	**6.21**	**1720[b]**	**62.1**
RE21-11-7887	21-614201	6–7	QBT3	0.0179 (J)	—	0.0435	NA	NA	NA	0.186	0.195	0.239	0.0855	0.095
RE21-11-7888	21-614201	8–9	QBT3	—	—	0.0166 (J)	NA	NA	NA	0.0855	0.0821	0.117	0.0448	0.0478
RE21-11-7889	21-614202	6–7	QBT3	—	—	—	NA	NA	NA	0.0301 (J)	0.0239 (J)	0.0348 (J)	0.0152 (J)	0.0145 (J)
RE21-11-7890	21-614202	8–9	QBT3	—	—	—	NA	NA	NA	0.0115 (J)	—	—	—	—
RE21-11-7891	21-614203	6–7	QBT3	—	—	—	NA	NA	NA	0.0319 (J)	0.0252 (J)	0.0397	0.0138 (J)	0.0185 (J)
RE21-11-7893	21-614204	6–7	QBT3	—	—	0.00901 (J)	0.0196	0.0103	—	0.0422	0.0443	0.0591	0.0285 (J)	0.0198 (J)
RE21-11-7894	21-614204	8–9	QBT3	—	—	—	0.0085	0.0029 (J)	—	—	—	—	—	—
RE21-11-7895	21-614205	6–7	QBT3	—	—	—	—	0.0099	0.003 (J)	—	—	—	—	—
RE21-11-7896	21-614205	8–9	QBT3	—	—	—	—	0.0088	0.0026 (J)	—	—	—	—	—
RE21-11-7897	21-614206	6–7	QBT3	—	—	—	—	0.0329	0.0091	0.0142 (J)	—	—	—	—
RE21-11-7898	21-614206	8–9	QBT3	—	—	—	—	0.0049	—	—	—	—	—	—
RE21-11-7899	21-614207	6–7	QBT3	—	—	—	—	0.0213	0.0058	—	—	—	—	—
RE21-11-7900	21-614207	8–9	QBT3	—	—	—	—	0.0057	—	—	—	—	—	—
RE21-11-7901	21-614208	6–7	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-7902	21-614208	8–9	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-7903	21-614209	6–7	QBT3	—	0.00417 (J)	—	—	—	—	—	—	—	—	—
RE21-11-7905	21-614210	1–2	SOIL	0.0593	—	0.0914	NA	NA	NA	0.108	0.0773	0.0879	0.0586	0.0159 (J)
RE21-11-7906	21-614210	3–4	QBT3	0.0568	—	0.101	NA	NA	NA	0.111	0.0801	0.0898	—	0.0428
RE21-11-7907	21-614211	1–2	SOIL	0.0276 (J)	—	0.0354	NA	NA	NA	0.0524	0.0411	0.0428	0.0315 (J)	0.0258 (J)
RE21-11-7909	21-614212	1–2	SOIL	—	—	0.024 (J)	NA	NA	NA	0.0609	0.067	0.072	0.0351 (J)	0.0347 (J)
RE21-11-7910	21-614212	3–4	QBT3	—	—	0.0109 (J)	NA	NA	NA	0.0679	0.0461	0.0566	0.0373	0.0257 (J)
RE21-11-7913	21-614214	1–2	SOIL	—	—	0.0176 (J)	NA	NA	NA	0.0701	0.0845	0.0903	0.0453	0.0331 (J)
RE21-11-7915	21-614215	1–2	SOIL	—	0.00431 (J)	—	NA	NA	NA	—	—	—	—	—
RE21-11-7916	21-614215	3–4	QBT3	—	0.00204 (J)	0.00869 (J)	NA	NA	NA	0.0174 (J)	—	0.012 (J)	—	—
RE21-11-7917	21-614216	1–2	SOIL	—	—	0.00768 (J)	NA	NA	NA	0.0172 (J)	—	—	—	—
RE21-11-7918	21-614216	3–4	QBT3	—	0.00403 (J)	—	NA	NA	NA	—	—	—	—	—
RE21-11-7920	21-614217	3–4	SOIL	—	0.0038 (J)	—	NA	NA	NA	—	—	—	—	—
RE21-11-7923	21-614219	1–2	SOIL	0.322 (J)	—	0.472 (J)	NA	NA	NA	0.478 (J)	0.483 (J)	0.474 (J)	0.0854 (J)	0.261 (J)
RE21-11-7925	21-614220	1–2	SOIL	—	—	—	—	0.0554	0.0141	—	—	—	—	—
RE21-11-7926	21-614220	3–4	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-7927	21-614221	1–2	SOIL	—	—	—	—	0.0075	—	—	—	—	—	—

Table 7.1-11 (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
Construction Worker SSL[a]				**18600**	**263000**	**66800**	**7.58**	**4.36**	**75.8**	**213**	**21.3**	**213**	**6680**[b]	**2060**
Industrial SSL[a]				**36700**	**851000**	**183000**	**8.26**	**8.26**	**8.26**	**23.4**	**2.34**	**23.4**	**18300**[b]	**234**
Residential SSL[a]				**3440**	**67500**	**17200**	**2.22**	**1.12**	**2.22**	**6.21**	**0.621**	**6.21**	**1720**[b]	**62.1**
RE21-11-7928	21-614221	3–4	SOIL	—	—	—	—	—	—	—	—	—	—	—
RE21-11-7933	21-614222	1–2	SOIL	—	—	0.0199 (J)	0.362	0.434	0.12	0.093	0.0911	0.128	0.0671	0.048
RE21-11-7934	21-614222	3–4	QBT3	—	—	0.0132 (J)	0.0269	0.049	0.0131	0.0385	0.0325 (J)	0.0412	0.0219 (J)	0.0189 (J)
RE21-11-7997	21-614222	5–6	QBT3	0.0295 (J)	—	0.0757	—	0.451	0.113	0.424	0.432	0.551	0.186	0.206
RE21-11-7936	21-614223	1–2	SOIL	—	—	0.0155 (J)	—	0.0045	0.0035 (J)	0.0384	0.038	0.0365 (J)	0.0362 (J)	0.0236 (J)
RE21-11-7937	21-614223	3–4	QBT3	—	—	0.0146 (J)	—	0.003 (J)	0.0027 (J)	0.027 (J)	0.0233 (J)	0.0308 (J)	0.0169 (J)	0.0116 (J)
RE21-11-7938	21-614223	5–6	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-7939	21-614224	1–2	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-7940	21-614224	3–4	QBT3	—	—	0.0122 (J)	—	0.0034 (J)	0.0018 (J)	0.019 (J)	0.0148 (J)	0.0194 (J)	0.0122 (J)	—
RE21-11-7941	21-614225	4–5	SOIL	—	—	0.0125 (J)	—	0.0524	—	0.0285 (J)	0.0231 (J)	0.0253 (J)	—	—
RE21-11-7942	21-614225	6–7	SOIL	0.186	—	0.292	—	0.106	0.0416	0.503	0.479	0.609	0.286	0.242
RE21-11-7963	21-614226	1–2	SOIL	0.133 (J)	—	0.231 (J)	NA	NA	NA	0.216 (J)	0.217 (J)	0.21 (J)	0.0463 (J)	0.101 (J)
RE21-11-7964	21-614226	3–4	SOIL	—	0.00377 (J)	0.02 (J)	NA	NA	NA	0.0466 (J)	0.0422 (J)	0.067 (J)	—	—
RE21-11-7965	21-614226	5–6	QBT3	—	—	—	NA	NA	NA	0.0424 (J)	0.0417 (J)	0.0735 (J)	—	0.0186 (J)
RE21-11-7966	21-614227	2–3	SOIL	0.0214 (J)	—	0.0431	NA	NA	NA	0.0634	0.0524	0.0699	0.0353 (J)	0.0331 (J)
RE21-11-7967	21-614227	4–5	QBT3	—	—	—	NA	NA	NA	0.0138 (J)	—	0.012 (J)	—	—
RE21-11-7968	21-614228	7–8	SOIL	0.136	—	0.259	NA	NA	NA	0.332	0.284	0.344	0.162	0.143
RE21-11-7969	21-614228	9–10	QBT3	0.0424	—	0.0821	NA	NA	NA	0.119	0.11	0.132	0.0643	0.0609
RE21-11-7970	21-614229	7–8	SOIL	0.019 (J)	—	0.0424	NA	NA	NA	0.097	0.0834	0.102	0.0456	0.0474
RE21-11-7971	21-614229	9–10	SOIL	0.0382	—	0.0822	NA	NA	NA	0.162	0.156	0.191	0.0822	0.0797
RE21-11-7974	21-614231	1–2	QBT3	0.0202 (J)	0.00206 (J-)	0.0404	NA	NA	NA	0.0617	0.0565	0.0698	0.0349 (J)	0.0345 (J)
RE21-11-7975	21-614231	3–4	QBT3	—	0.003 (J-)	—	NA	NA	NA	—	—	—	—	—
RE21-11-7976	21-614232	1–2	QBT3	—	—	0.0134 (J)	NA	NA	NA	0.0421	0.032 (J)	0.0402	0.0194 (J)	0.0209 (J)
RE21-11-7977	21-614232	3–4	QBT3	0.0331 (J)	0.00218 (J-)	0.0398	NA	NA	NA	0.0609	0.0621	0.0702	0.0576	0.0297 (J)
RE21-11-7978	21-614233	4–5	SOIL	2.31 (J)	—	3.41 (J)	NA	NA	NA	3.43 (J)	3.15 (J)	3.15 (J)	0.616 (J)	1.18 (J)
RE21-11-7979	21-614233	6–7	QBT3	0.152 (J)	—	0.255 (J)	NA	NA	NA	0.287 (J)	0.265 (J)	0.279 (J)	0.0523 (J)	0.105 (J)
RE21-11-7980	21-614234	4–5	SOIL	—	—	0.0132 (J)	NA	NA	NA	0.0377 (J)	0.0421 (J)	0.0502 (J)	0.0267 (J)	0.0234 (J)
RE21-11-7981	21-614234	6–7	QBT3	0.0226 (J)	—	0.0473	NA	NA	NA	0.0688	0.0634	0.0721	0.0448	0.0302 (J)

Table 7.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Media	Bis(2-ethylhexyl)phthalate	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Dichlorobenzidine[3,3'-]	Di-n-butylphthalate	Ethylbenzene	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)
Construction Worker SSL[a]				**4760**	**20600**	**21.3**	**552[e]**	**371**	**23800**	**6630**	**8910**	**8910**	**na[f]**	**na**
Industrial SSL[a]				**1370**	**2340**	**2.34**	**1000[g]**	**42.6**	**68400**	**385**	**24400**	**24400**	**na**	**na**
Residential SSL[a]				**347**	**621**	**0.621**	**78[g]**	**10.8**	**6110**	**69.7**	**2290**	**2290**	**na**	**na**
RE21-11-7843	21-614180	1–2	SOIL	—	0.573	—	—	—	—	—	0.944	0.0239 (J)	NA	NA
RE21-11-7844	21-614180	3–4	QBT3	—	0.0205 (J)	—	—	—	—	—	0.0336 (J)	—	NA	NA
RE21-11-7846	21-614181	1–2	SOIL	—	0.109	0.0266 (J)	—	—	—	—	0.174	—	NA	NA
RE21-11-7847	21-614181	3–4	QBT3	—	—	—	—	—	—	—	—	—	NA	NA
RE21-11-7851	21-614183	6–7	QBT3	—	0.0934	—	—	—	—	—	0.255	—	NA	NA
RE21-11-7852	21-614183	8–9	QBT3	—	0.0487	—	—	—	—	—	0.164	—	NA	NA
RE21-11-7853	21-614184	6–7	QBT3	—	0.0758	0.0183 (J)	—	—	—	—	0.115	—	NA	NA
RE21-11-7854	21-614184	8–9	QBT3	—	—	—	—	—	—	—	—	—	NA	NA
RE21-11-7855	21-614185	6–7	QBT3	—	—	—	—	—	—	—	0.0225 (J)	—	NA	NA
RE21-11-7856	21-614185	8–9	QBT3	—	—	—	—	—	—	—	0.0204 (J)	—	NA	NA
RE21-11-7857	21-614186	6–7	QBT3	—	0.153	—	—	—	—	—	0.511	0.106	NA	NA
RE21-11-7858	21-614186	8–9	QBT3	—	0.0244 (J)	—	—	—	—	—	0.0619	—	NA	NA
RE21-11-7859	21-614187	6–7	SOIL	—	—	—	—	—	—	—	0.0201 (J)	—	NA	NA
RE21-11-7860	21-614187	8–9	QBT3	—	0.0284 (J)	—	—	—	—	—	0.0966	0.0144 (J)	NA	NA
RE21-11-7861	21-614188	6–7	QBT3	—	—	—	—	—	—	—	0.0292 (J)	—	NA	NA
RE21-11-7863	21-614189	6–7	SOIL	—	0.0972	—	—	—	—	—	0.303	0.0488	NA	NA
RE21-11-7864	21-614189	8–9	QBT3	—	—	—	—	—	—	—	0.0131 (J)	—	NA	NA
RE21-11-7865	21-614190	6–7	QBT3	—	—	—	—	—	—	—	—	—	NA	NA
RE21-11-7866	21-614190	8–9	QBT3	—	—	—	—	—	—	—	—	—	NA	NA
RE21-11-7871	21-614193	6–7	QBT3	—	—	—	—	—	—	—	—	—	NA	NA
RE21-11-7872	21-614193	8–9	QBT3	—	—	—	—	—	—	—	—	—	NA	NA
RE21-11-7873	21-614194	6–7	QBT3	—	—	—	—	—	—	—	0.0157 (J)	—	NA	NA
RE21-11-7875	21-614195	6–7	QBT3	—	—	—	—	—	—	—	—	—	NA	NA
RE21-11-7876	21-614195	8–9	QBT3	—	—	—	—	—	—	—	0.0128 (J)	—	NA	NA
RE21-11-7877	21-614196	6–7	QBT3	—	0.0447	—	—	—	—	—	0.151	0.0177 (J)	NA	NA
RE21-11-7878	21-614196	8–9	QBT3	—	0.0319 (J)	—	—	—	—	—	0.0942	—	NA	NA

Table 7.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Media	Bis(2-ethylhexyl)phthalate	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Dichlorobenzidine[3,3'-]	Di-n-butylphthalate	Ethylbenzene	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)
Construction Worker SSL[a]				**4760**	**20600**	**21.3**	**552**[e]	**371**	**23800**	**6630**	**8910**	**8910**	**na**[f]	**na**
Industrial SSL[a]				**1370**	**2340**	**2.34**	**1000**[g]	**42.6**	**68400**	**385**	**24400**	**24400**	**na**	**na**
Residential SSL[a]				**347**	**621**	**0.621**	**78**[g]	**10.8**	**6110**	**69.7**	**2290**	**2290**	**na**	**na**
RE21-11-7880	21-614197	8–9	QBT3	—	—	—	—	—	—	—	—	—	NA	NA
RE21-11-7881	21-614198	6–7	QBT3	—	0.104	0.0371 (J)	—	—	—	—	0.199	—	NA	NA
RE21-11-7882	21-614198	8–9	QBT3	—	0.0118 (J)	—	—	—	—	—	0.019 (J)	—	NA	NA
RE21-11-7887	21-614201	6–7	QBT3	—	0.212	—	—	0.226 (J)	—	—	0.395	—	NA	NA
RE21-11-7888	21-614201	8–9	QBT3	—	0.0911	—	—	—	—	—	0.162	—	NA	NA
RE21-11-7889	21-614202	6–7	QBT3	—	0.0207 (J)	—	—	—	—	—	0.0471	—	NA	NA
RE21-11-7890	21-614202	8–9	QBT3	—	—	—	—	—	—	—	0.0141 (J)	—	NA	NA
RE21-11-7891	21-614203	6–7	QBT3	—	0.0245 (J)	—	—	—	—	—	0.0518	—	NA	NA
RE21-11-7893	21-614204	6–7	QBT3	—	0.0562	—	—	—	—	—	0.117	—	0.00000107 (J)	0.00000211 (J)
RE21-11-7894	21-614204	8–9	QBT3	—	—	—	—	—	—	—	—	—	0.00000747	0.0000116
RE21-11-7895	21-614205	6–7	QBT3	—	—	—	—	—	—	—	—	—	0.00000353 (J)	0.00000725
RE21-11-7896	21-614205	8–9	QBT3	—	—	—	—	—	—	—	—	—	0.00000105 (J)	0.0000019 (J)
RE21-11-7897	21-614206	6–7	QBT3	—	—	—	—	—	—	—	0.0237 (J)	—	0.00000153 (J)	0.00000328 (J)
RE21-11-7898	21-614206	8–9	QBT3	—	—	—	—	—	—	—	—	—	0.00000159 (J)	0.00000288 (J)
RE21-11-7899	21-614207	6–7	QBT3	—	—	—	—	—	—	—	—	—	0.00000115 (J)	0.00000193 (J)
RE21-11-7900	21-614207	8–9	QBT3	—	—	—	—	—	—	—	—	—	0.00000711	0.000011
RE21-11-7901	21-614208	6–7	QBT3	—	—	—	—	—	—	—	—	—	0.000000613 (J)	0.00000113 (J)
RE21-11-7902	21-614208	8–9	QBT3	—	—	—	—	—	—	—	—	—	0.000000518 (J)	0.000000518 (J)
RE21-11-7903	21-614209	6–7	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-7905	21-614210	1–2	SOIL	—	0.0907	—	—	—	—	—	0.321	0.0804	NA	NA
RE21-11-7906	21-614210	3–4	QBT3	—	0.0916	—	—	—	—	—	0.335	0.073	NA	NA
RE21-11-7907	21-614211	1–2	SOIL	—	0.0446	—	—	—	—	—	0.131	0.0265 (J)	NA	NA
RE21-11-7909	21-614212	1–2	SOIL	—	0.0749	—	—	—	—	0.000376 (J)	0.158	0.0125 (J)	NA	NA
RE21-11-7910	21-614212	3–4	QBT3	—	0.0563	—	—	—	—	—	0.126	—	NA	NA
RE21-11-7913	21-614214	1–2	SOIL	—	0.0831	—	—	—	—	—	0.167	—	NA	NA
RE21-11-7915	21-614215	1–2	SOIL	—	—	—	—	—	—	—	—	—	NA	NA

Table 7.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Media	Bis(2-ethylhexyl)phthalate	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Dichlorobenzidine[3,3'-]	Di-n-butylphthalate	Ethylbenzene	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)
Construction Worker SSL[a]				**4760**	**20600**	**21.3**	**552**[e]	**371**	**23800**	**6630**	**8910**	**8910**	**na**[f]	**na**
Industrial SSL[a]				**1370**	**2340**	**2.34**	**1000**[g]	**42.6**	**68400**	**385**	**24400**	**24400**	**na**	**na**
Residential SSL[a]				**347**	**621**	**0.621**	**78**[g]	**10.8**	**6110**	**69.7**	**2290**	**2290**	**na**	**na**
RE21-11-7916	21-614215	3–4	QBT3	—	0.0109 (J)	—	—	—	—	—	0.038	—	NA	NA
RE21-11-7917	21-614216	1–2	SOIL	—	0.0139 (J)	—	—	—	—	—	0.0355 (J)	—	NA	NA
RE21-11-7918	21-614216	3–4	QBT3	—	—	—	—	—	—	—	—	—	NA	NA
RE21-11-7920	21-614217	3–4	SOIL	—	—	—	—	—	—	—	—	—	NA	NA
RE21-11-7923	21-614219	1–2	SOIL	—	0.466 (J)	0.209 (J)	0.181 (J)	—	—	—	1.65 (J)	0.28 (J)	NA	NA
RE21-11-7925	21-614220	1–2	SOIL	—	—	—	—	—	—	—	—	—	0.0000012 (J)	0.00000263 (J)
RE21-11-7926	21-614220	3–4	QBT3	—	—	—	—	—	—	—	—	—	0.00000508	0.00001
RE21-11-7927	21-614221	1–2	SOIL	—	—	—	—	—	—	—	—	—	0.00000145 (J)	0.00000263 (J)
RE21-11-7928	21-614221	3–4	SOIL	—	—	—	—	—	—	—	—	—	—	—
RE21-11-7933	21-614222	1–2	SOIL	—	0.0989	—	—	—	—	—	0.197	—	0.0000332	0.0000885
RE21-11-7934	21-614222	3–4	QBT3	—	0.0347 (J)	—	—	—	—	—	0.0846	—	0.0000124	0.0000302
RE21-11-7997	21-614222	5–6	QBT3	—	0.477	—	—	—	—	—	0.922	0.0214 (J)	0.0000444	0.000126
RE21-11-7936	21-614223	1–2	SOIL	—	0.0314 (J)	0.017 (J)	—	—	—	—	0.105	—	0.0000112	0.0000317
RE21-11-7937	21-614223	3–4	QBT3	—	0.024 (J)	—	—	—	—	—	0.0604	—	0.00000565	0.0000163
RE21-11-7938	21-614223	5–6	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-7939	21-614224	1–2	QBT3	—	—	—	—	—	—	—	—	—	0.000000683 (J)	0.00000146 (J)
RE21-11-7940	21-614224	3–4	QBT3	—	0.0167 (J)	—	—	—	—	—	0.0486	—	—	—
RE21-11-7941	21-614225	4–5	SOIL	—	0.0189 (J)	0.0253 (J)	—	—	—	—	0.0627 (J)	—	0.0000163	0.0000452
RE21-11-7942	21-614225	6–7	SOIL	—	0.523	—	0.0959 (J)	0.221 (J)	—	—	1.4	0.171	0.000255 (J)	0.000586
RE21-11-7963	21-614226	1–2	SOIL	—	0.242 (J)	0.101 (J)	0.0763 (J)	—	—	—	0.687 (J)	0.128 (J)	NA	NA
RE21-11-7964	21-614226	3–4	SOIL	—	0.047 (J)	0.0318 (J)	—	—	—	—	0.12 (J)	—	NA	NA
RE21-11-7965	21-614226	5–6	QBT3	—	0.0443 (J)	—	—	—	—	—	0.0784 (J)	—	NA	NA
RE21-11-7966	21-614227	2–3	SOIL	—	0.0617	—	—	—	—	—	0.135	0.0246 (J)	NA	NA
RE21-11-7967	21-614227	4–5	QBT3	—	—	—	—	—	—	—	0.0222 (J)	—	NA	NA
RE21-11-7968	21-614228	7–8	SOIL	—	0.317	—	0.0936 (J)	—	—	—	0.854	0.155	NA	NA
RE21-11-7969	21-614228	9–10	QBT3	—	0.12	—	—	—	—	—	0.269	0.0488	NA	NA

Table 7.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Media	Bis(2-ethylhexyl)phthalate	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Dichlorobenzidine[3,3'-]	Di-n-butylphthalate	Ethylbenzene	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)
Construction Worker SSL[a]				**4760**	**20600**	**21.3**	**552[e]**	**371**	**23800**	**6630**	**8910**	**8910**	**na[f]**	**na**
Industrial SSL[a]				**1370**	**2340**	**2.34**	**1000[g]**	**42.6**	**68400**	**385**	**24400**	**24400**	**na**	**na**
Residential SSL[a]				**347**	**621**	**0.621**	**78[g]**	**10.8**	**6110**	**69.7**	**2290**	**2290**	**na**	**na**
RE21-11-7970	21-614229	7–8	SOIL	—	0.0902	—	—	—	—	—	0.191	0.0226 (J)	NA	NA
RE21-11-7971	21-614229	9–10	SOIL	0.0924 (J)	0.159	—	—	—	0.158 (J)	—	0.377	0.0433	NA	NA
RE21-11-7974	21-614231	1–2	QBT3	—	0.0639	—	—	—	—	—	0.203	0.0257 (J)	NA	NA
RE21-11-7975	21-614231	3–4	QBT3	—	—	—	—	—	—	—	0.0226 (J)	—	NA	NA
RE21-11-7976	21-614232	1–2	QBT3	—	0.0298 (J)	0.0142 (J)	—	—	—	—	0.104	—	NA	NA
RE21-11-7977	21-614232	3–4	QBT3	—	0.0572	—	—	—	—	—	0.161	0.0271 (J)	NA	NA
RE21-11-7978	21-614233	4–5	SOIL	—	3.45 (J)	1.47 (J)	1.32 (J)	—	—	—	11.2 (J)	2.07 (J)	NA	NA
RE21-11-7979	21-614233	6–7	QBT3	—	0.276 (J)	0.141 (J)	0.0957 (J)	—	—	—	0.893 (J)	0.147 (J)	NA	NA
RE21-11-7980	21-614234	4–5	SOIL	—	0.0406 (J)	—	—	—	—	—	0.089 (J)	—	NA	NA
RE21-11-7981	21-614234	6–7	QBT3	—	0.0612	—	—	—	—	—	0.192	0.0178 (J)	NA	NA

Table 7.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Media	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-]	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]
Construction Worker SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE21-11-7843	21-614180	1–2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7844	21-614180	3–4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7846	21-614181	1–2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7847	21-614181	3–4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7851	21-614183	6–7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7852	21-614183	8–9	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7853	21-614184	6–7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7854	21-614184	8–9	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7855	21-614185	6–7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7856	21-614185	8–9	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7857	21-614186	6–7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7858	21-614186	8–9	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7859	21-614187	6–7	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7860	21-614187	8–9	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7861	21-614188	6–7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7863	21-614189	6–7	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7864	21-614189	8–9	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7865	21-614190	6–7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7866	21-614190	8–9	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7871	21-614193	6–7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7872	21-614193	8–9	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7873	21-614194	6–7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7875	21-614195	6–7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7876	21-614195	8–9	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7877	21-614196	6–7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7878	21-614196	8–9	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 7.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Media	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-]	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]
Construction Worker SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE21-11-7880	21-614197	8–9	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7881	21-614198	6–7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7882	21-614198	8–9	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7887	21-614201	6–7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7888	21-614201	8–9	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7889	21-614202	6–7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7890	21-614202	8–9	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7891	21-614203	6–7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7893	21-614204	6–7	QBT3	—	—	0.000000643 (J)	—	—	—	—	—	—	—	—
RE21-11-7894	21-614204	8–9	QBT3	0.000000643 (J)	—	0.00000151 (J)	—	0.00000136 (J)	0.00000136 (J)	0.0000116	0.000000569 (J)	—	—	—
RE21-11-7895	21-614205	6–7	QBT3	0.00000124 (J)	—	0.00000427 (J)	—	—	—	0.00000117 (J)	—	—	—	—
RE21-11-7896	21-614205	8–9	QBT3	—	—	—	—	—	—	0.00000225 (J)	—	—	—	—
RE21-11-7897	21-614206	6–7	QBT3	0.000000847 (J)	—	0.00000177 (J)	—	—	—	—	—	—	—	—
RE21-11-7898	21-614206	8–9	QBT3	0.000000655 (J)	—	0.000000655 (J)	—	—	—	0.00000053 (J)	—	—	—	—
RE21-11-7899	21-614207	6–7	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-7900	21-614207	8–9	QBT3	—	—	—	—	0.00000119 (J)	0.00000153 (J)	0.0000268	—	—	—	—
RE21-11-7901	21-614208	6–7	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-7902	21-614208	8–9	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-7903	21-614209	6–7	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-7905	21-614210	1–2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7906	21-614210	3–4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7907	21-614211	1–2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7909	21-614212	1–2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7910	21-614212	3–4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7913	21-614214	1–2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7915	21-614215	1–2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 7.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Media	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-]	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]
Construction Worker SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE21-11-7916	21-614215	3–4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7917	21-614216	1–2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7918	21-614216	3–4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7920	21-614217	3–4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7923	21-614219	1–2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7925	21-614220	1–2	SOIL	0.000000911 (J)	—	0.00000268 (J)	—	—	—	—	0.000000709 (J)	—	—	—
RE21-11-7926	21-614220	3–4	QBT3	—	—	0.000000637 (J)	—	0.00000107 (J)	0.00000124 (J)	0.00000935	0.000000703 (J)	—	—	—
RE21-11-7927	21-614221	1–2	SOIL	0.00000111 (J)	—	0.00000314 (J)	—	—	—	—	—	—	—	—
RE21-11-7928	21-614221	3–4	SOIL	—	—	—	—	—	—	—	—	—	—	—
RE21-11-7933	21-614222	1–2	SOIL	0.0000222	0.000000708 (J)	0.0000858	—	0.00000152 (J)	0.000000522 (J)	0.00000905	0.00000219 (J)	0.00000104 (J)	—	—
RE21-11-7934	21-614222	3–4	QBT3	0.00000645	—	0.0000249	—	—	—	0.00000175 (J)	—	—	—	—
RE21-11-7997	21-614222	5–6	QBT3	0.0000274	0.000000865 (J)	0.000122	—	0.00000151 (J)	0.000000525 (J)	0.00000768	0.00000135 (J)	0.000000626 (J)	—	0.000000502 (J)
RE21-11-7936	21-614223	1–2	SOIL	0.00000547	—	0.0000239	—	—	—	0.00000176 (J)	—	—	—	—
RE21-11-7937	21-614223	3–4	QBT3	0.00000343 (J)	—	0.0000135	—	—	—	—	—	—	—	—
RE21-11-7938	21-614223	5–6	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-7939	21-614224	1–2	QBT3	—	—	0.000000633 (J)	—	—	—	—	—	—	—	—
RE21-11-7940	21-614224	3–4	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-7941	21-614225	4–5	SOIL	0.0000156	—	0.0000474	—	0.000000798 (J)	—	0.00000499	0.00000108 (J)	—	—	—
RE21-11-7942	21-614225	6–7	SOIL	0.0000682	0.00000353 (J)	0.000206	0.00000336 (J)	0.0000115	0.00000464 (J)	0.0000849	0.00000704 (J+)	0.00000224 (J)	0.000000882 (J)	0.00000293 (J)
RE21-11-7963	21-614226	1–2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7964	21-614226	3–4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7965	21-614226	5–6	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7966	21-614227	2–3	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7967	21-614227	4–5	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7968	21-614228	7–8	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7969	21-614228	9–10	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 7.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Media	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-]	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]
Construction Worker SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE21-11-7970	21-614229	7–8	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7971	21-614229	9–10	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7974	21-614231	1–2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7975	21-614231	3–4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7976	21-614232	1–2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7977	21-614232	3–4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7978	21-614233	4–5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7979	21-614233	6–7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7980	21-614234	4–5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-7981	21-614234	6–7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 7.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]
Construction Worker SSL[a]				**na**	**213**	**10600**	**1240[e]**	**702**	**na**	**na**	**na**	**na**	**na**	**na**
Industrial SSL[a]				**na**	**23.4**	**1090**	**4100[g]**	**252**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**na**	**6.21**	**199**	**310[g]**	**45**	**na**	**na**	**na**	**na**	**na**	**na**
RE21-11-7843	21-614180	1–2	SOIL	NA	0.202	—	0.0137 (J)	0.0334 (J)	NA	NA	NA	NA	NA	NA
RE21-11-7844	21-614180	3–4	QBT3	NA	0.0162 (J)	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7846	21-614181	1–2	SOIL	NA	0.0433	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7847	21-614181	3–4	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7851	21-614183	6–7	QBT3	NA	0.0504 (J)	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7852	21-614183	8–9	QBT3	NA	0.0318 (J)	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7853	21-614184	6–7	QBT3	NA	0.037 (J)	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7854	21-614184	8–9	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7855	21-614185	6–7	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7856	21-614185	8–9	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7857	21-614186	6–7	QBT3	NA	0.0744	—	0.0541	0.253	NA	NA	NA	NA	NA	NA
RE21-11-7858	21-614186	8–9	QBT3	NA	0.0189 (J)	—	—	0.0211 (J)	NA	NA	NA	NA	NA	NA
RE21-11-7859	21-614187	6–7	SOIL	NA	—	0.00307 (J)	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7860	21-614187	8–9	QBT3	NA	0.0201 (J)	0.00292 (J)	—	0.0206 (J)	NA	NA	NA	NA	NA	NA
RE21-11-7861	21-614188	6–7	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7863	21-614189	6–7	SOIL	NA	0.0488	—	0.0142 (J)	0.0728	NA	NA	NA	NA	NA	NA
RE21-11-7864	21-614189	8–9	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7865	21-614190	6–7	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7866	21-614190	8–9	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7871	21-614193	6–7	QBT3	NA	—	0.00328 (J)	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7872	21-614193	8–9	QBT3	NA	—	0.00351 (J)	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7873	21-614194	6–7	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7875	21-614195	6–7	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7876	21-614195	8–9	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7877	21-614196	6–7	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7878	21-614196	8–9	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA

Table 7.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]
Construction Worker SSL[a]				**na**	**213**	**10600**	**1240[e]**	**702**	**na**	**na**	**na**	**na**	**na**	**na**
Industrial SSL[a]				**na**	**23.4**	**1090**	**4100[g]**	**252**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**na**	**6.21**	**199**	**310[g]**	**45**	**na**	**na**	**na**	**na**	**na**	**na**
RE21-11-7880	21-614197	8–9	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7881	21-614198	6–7	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7882	21-614198	8–9	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7887	21-614201	6–7	QBT3	NA	0.0763	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7888	21-614201	8–9	QBT3	NA	0.0384	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7889	21-614202	6–7	QBT3	NA	0.0138 (J)	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7890	21-614202	8–9	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7891	21-614203	6–7	QBT3	NA	0.0124 (J)	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7893	21-614204	6–7	QBT3	—	0.0241 (J)	—	—	—	0.00000753 (J)	—	—	—	—	—
RE21-11-7894	21-614204	8–9	QBT3	0.00000225 (J)	—	—	—	—	0.00000396 (J)	—	—	0.0000007 (J)	—	—
RE21-11-7895	21-614205	6–7	QBT3	0.000000661 (J)	—	—	—	—	0.0000268	0.00000396 (J)	—	—	—	—
RE21-11-7896	21-614205	8–9	QBT3	—	—	—	—	—	0.00000282 (J)	—	—	0.000000637 (J)	—	—
RE21-11-7897	21-614206	6–7	QBT3	0.00000124 (J)	—	—	—	—	0.0000111	0.00000111 (J)	—	—	—	—
RE21-11-7898	21-614206	8–9	QBT3	0.000000517 (J)	—	—	—	—	0.00000863 (J)	—	—	—	—	—
RE21-11-7899	21-614207	6–7	QBT3	—	—	—	—	—	0.00000444 (J)	—	—	—	—	—
RE21-11-7900	21-614207	8–9	QBT3	—	—	—	—	—	0.00000582 (J)	—	0.000000556 (J)	0.00000896	—	—
RE21-11-7901	21-614208	6–7	QBT3	—	—	0.00431 (J)	—	—	0.00000515 (J)	—	—	—	—	—
RE21-11-7902	21-614208	8–9	QBT3	—	—	0.00372 (J)	—	—	0.00000291 (J)	—	—	—	—	—
RE21-11-7903	21-614209	6–7	QBT3	—	—	—	—	—	0.00000126 (J)	—	—	—	—	—
RE21-11-7905	21-614210	1–2	SOIL	NA	0.0501	—	0.0307 (J)	0.155	NA	NA	NA	NA	NA	NA
RE21-11-7906	21-614210	3–4	QBT3	NA	0.0392	—	0.023 (J)	0.105	NA	NA	NA	NA	NA	NA
RE21-11-7907	21-614211	1–2	SOIL	NA	0.0258 (J)	—	—	0.0152 (J)	NA	NA	NA	NA	NA	NA
RE21-11-7909	21-614212	1–2	SOIL	NA	0.0308 (J)	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7910	21-614212	3–4	QBT3	NA	0.0359	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7913	21-614214	1–2	SOIL	NA	0.0428 (J)	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7915	21-614215	1–2	SOIL	NA	—	—	—	—	NA	NA	NA	NA	NA	NA

Table 7.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]
Construction Worker SSL[a]				**na**	**213**	**10600**	**1240[e]**	**702**	**na**	**na**	**na**	**na**	**na**	**na**
Industrial SSL[a]				**na**	**23.4**	**1090**	**4100[g]**	**252**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**na**	**6.21**	**199**	**310[g]**	**45**	**na**	**na**	**na**	**na**	**na**	**na**
RE21-11-7916	21-614215	3–4	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7917	21-614216	1–2	SOIL	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7918	21-614216	3–4	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7920	21-614217	3–4	SOIL	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7923	21-614219	1–2	SOIL	NA	0.257 (J)	—	0.113 (J)	0.5 (J)	NA	NA	NA	NA	NA	NA
RE21-11-7925	21-614220	1–2	SOIL	0.00000198 (J)	—	—	—	—	0.00000863 (J)	0.00000261 (J)	—	—	—	—
RE21-11-7926	21-614220	3–4	QBT3	0.000000703 (J)	—	—	—	—	0.00000355 (J)	—	—	0.00000109 (J)	—	—
RE21-11-7927	21-614221	1–2	SOIL	—	—	—	—	—	0.00000675 (J)	0.00000208 (J)	—	—	—	—
RE21-11-7928	21-614221	3–4	SOIL	—	—	—	—	—	0.000001 (J)	—	—	—	—	—
RE21-11-7933	21-614222	1–2	SOIL	0.0000221	0.0572	—	—	—	0.000433	0.0000926	—	—	—	0.000000989 (J)
RE21-11-7934	21-614222	3–4	QBT3	0.00000517	0.0211 (J)	—	—	—	0.000185	0.0000295	—	—	—	—
RE21-11-7997	21-614222	5–6	QBT3	0.0000249	0.173	—	0.00841 (J)	—	0.000671	0.000133	—	—	—	—
RE21-11-7936	21-614223	1–2	SOIL	0.00000472 (J)	0.0273 (J)	—	—	—	0.00017	0.0000277	—	—	0.000000575 (J)	—
RE21-11-7937	21-614223	3–4	QBT3	0.00000278 (J)	0.0124 (J)	—	—	—	0.0000776	0.000015	—	—	—	—
RE21-11-7938	21-614223	5–6	QBT3	—	—	—	—	—	0.00000352 (J)	—	—	—	—	—
RE21-11-7939	21-614224	1–2	QBT3	—	—	—	—	—	0.00000727 (J)	0.00000103 (J)	—	—	—	—
RE21-11-7940	21-614224	3–4	QBT3	—	—	—	—	—	0.00000417 (J)	—	—	—	—	—
RE21-11-7941	21-614225	4–5	SOIL	0.0000127	0.0132 (J)	—	—	—	0.000217 (J+)	0.0000376	—	—	0.000000823 (J)	—
RE21-11-7942	21-614225	6–7	SOIL	0.000116	0.26	—	0.0444	0.186	0.00323	0.000124	—	0.00000545	0.00000567	0.00000245 (J)
RE21-11-7963	21-614226	1–2	SOIL	NA	0.114 (J)	—	0.0527 (J)	0.217 (J)	NA	NA	NA	NA	NA	NA
RE21-11-7964	21-614226	3–4	SOIL	NA	0.0311 (J)	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7965	21-614226	5–6	QBT3	NA	0.0292 (J)	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7966	21-614227	2–3	SOIL	NA	0.0285 (J)	—	0.00748 (J)	0.0274 (J)	NA	NA	NA	NA	NA	NA
RE21-11-7967	21-614227	4–5	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7968	21-614228	7–8	SOIL	NA	0.143	—	0.0552	0.235	NA	NA	NA	NA	NA	NA
RE21-11-7969	21-614228	9–10	QBT3	NA	0.0537	—	0.0166 (J)	0.0681	NA	NA	NA	NA	NA	NA

Table 7.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]
Construction Worker SSL[a]				**na**	**213**	**10600**	**1240[e]**	**702**	**na**	**na**	**na**	**na**	**na**	**na**
Industrial SSL[a]				**na**	**23.4**	**1090**	**4100[g]**	**252**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**na**	**6.21**	**199**	**310[g]**	**45**	**na**	**na**	**na**	**na**	**na**	**na**
RE21-11-7970	21-614229	7–8	SOIL	NA	0.0402	—	—	0.0262 (J)	NA	NA	NA	NA	NA	NA
RE21-11-7971	21-614229	9–10	SOIL	NA	0.072	—	0.0102 (J)	0.0389	NA	NA	NA	NA	NA	NA
RE21-11-7974	21-614231	1–2	QBT3	NA	0.0334 (J)	—	—	0.022 (J)	NA	NA	NA	NA	NA	NA
RE21-11-7975	21-614231	3–4	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7976	21-614232	1–2	QBT3	NA	0.0194 (J)	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7977	21-614232	3–4	QBT3	NA	0.0457	—	0.01 (J)	0.0386	NA	NA	NA	NA	NA	NA
RE21-11-7978	21-614233	4–5	SOIL	NA	1.77 (J)	—	0.69 (J)	3.12 (J)	NA	NA	NA	NA	NA	NA
RE21-11-7979	21-614233	6–7	QBT3	NA	0.151 (J)	—	0.0445 (J)	0.193 (J)	NA	NA	NA	NA	NA	NA
RE21-11-7980	21-614234	4–5	SOIL	NA	0.0245 (J)	—	—	—	NA	NA	NA	NA	NA	NA
RE21-11-7981	21-614234	6–7	QBT3	NA	0.0361 (J)	—	—	0.0251 (J)	NA	NA	NA	NA	NA	NA

Table 7.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofurans (Totals)	Pentachlorophenol	Phenanthrene	Pyrene	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Total Petroleum Hydrocarbons Diesel Range Organics	Trimethylbenzene[1,2,4-]	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
Construction Worker SSL[a]				**na**	**1030**	**7150**	**6680**	**0.0127**	**na**	**na**	**688[e]**	**27500**	**3130[h]**
Industrial SSL[a]				**na**	**100**	**20500**	**18300**	**0.00147**	**na**	**200[i]**	**260[g]**	**31500**	**3610[h]**
Residential SSL[a]				**na**	**29.8**	**1830**	**1720**	**0.000374**	**na**	**200[i]**	**62[g]**	**9550**	**1090[h]**
RE21-11-7843	21-614180	1–2	SOIL	NA	—	0.469	1.15	NA	NA	276	—	—	—
RE21-11-7844	21-614180	3–4	QBT3	NA	—	0.0205 (J)	0.0371 (J)	NA	NA	10.9	—	—	—
RE21-11-7846	21-614181	1–2	SOIL	NA	—	0.11	0.245	NA	NA	88.1 (J)	—	—	—
RE21-11-7847	21-614181	3–4	QBT3	NA	—	—	—	NA	NA	3.57 (J)	—	—	—
RE21-11-7851	21-614183	6–7	QBT3	NA	—	0.149	0.174	NA	NA	NA	—	—	—
RE21-11-7852	21-614183	8–9	QBT3	NA	—	0.118	0.1	NA	NA	NA	—	—	—
RE21-11-7853	21-614184	6–7	QBT3	NA	—	0.0811	0.152	NA	NA	NA	—	—	—
RE21-11-7854	21-614184	8–9	QBT3	NA	—	—	0.0144 (J)	NA	NA	NA	—	—	—
RE21-11-7855	21-614185	6–7	QBT3	NA	—	0.0185 (J)	0.0302 (J)	NA	NA	NA	—	—	—
RE21-11-7856	21-614185	8–9	QBT3	NA	—	0.0197 (J)	0.0157 (J)	NA	NA	NA	—	—	—
RE21-11-7857	21-614186	6–7	QBT3	NA	—	0.565	0.417	NA	NA	NA	—	—	—
RE21-11-7858	21-614186	8–9	QBT3	NA	—	0.0634	0.075	NA	NA	NA	—	—	—
RE21-11-7859	21-614187	6–7	SOIL	NA	—	0.0237 (J)	0.0241 (J)	NA	NA	NA	—	—	—
RE21-11-7860	21-614187	8–9	QBT3	NA	—	0.0888	0.0637	NA	NA	NA	—	—	—
RE21-11-7861	21-614188	6–7	QBT3	NA	—	0.0255 (J)	0.0252 (J)	NA	NA	NA	—	—	—
RE21-11-7863	21-614189	6–7	SOIL	NA	—	0.318	0.22	NA	NA	NA	—	0.000673 (J)	0.00093 (J)
RE21-11-7864	21-614189	8–9	QBT3	NA	—	0.0131 (J)	0.0131 (J)	NA	NA	NA	—	—	—
RE21-11-7865	21-614190	6–7	QBT3	NA	9.98 (J)	—	—	NA	NA	NA	—	—	—
RE21-11-7866	21-614190	8–9	QBT3	NA	1.06 (J)	—	—	NA	NA	NA	—	—	—
RE21-11-7871	21-614193	6–7	QBT3	NA	—	—	—	NA	NA	NA	—	—	—
RE21-11-7872	21-614193	8–9	QBT3	NA	—	—	—	NA	NA	NA	—	—	—
RE21-11-7873	21-614194	6–7	QBT3	NA	—	0.0168 (J)	0.0137 (J)	NA	NA	NA	—	—	—
RE21-11-7875	21-614195	6–7	QBT3	NA	—	—	—	NA	NA	NA	—	—	—
RE21-11-7876	21-614195	8–9	QBT3	NA	—	0.0147 (J)	0.012 (J)	NA	NA	NA	—	—	—
RE21-11-7877	21-614196	6–7	QBT3	NA	—	0.143	0.152	NA	NA	NA	—	—	—
RE21-11-7878	21-614196	8–9	QBT3	NA	—	0.0897	0.0909	NA	NA	NA	—	—	—

Table 7.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofurans (Totals)	Pentachlorophenol	Phenanthrene	Pyrene	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Total Petroleum Hydrocarbons Diesel Range Organics	Trimethylbenzene[1,2,4-]	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
Construction Worker SSL[a]				**na**	**1030**	**7150**	**6680**	**0.0127**	**na**	**na**	**688[e]**	**27500**	**3130[h]**
Industrial SSL[a]				**na**	**100**	**20500**	**18300**	**0.00147**	**na**	**200[i]**	**260[g]**	**31500**	**3610[h]**
Residential SSL[a]				**na**	**29.8**	**1830**	**1720**	**0.000374**	**na**	**200[i]**	**62[g]**	**9550**	**1090[h]**
RE21-11-7880	21-614197	8–9	QBT3	NA	—	—	—	NA	NA	NA	—	—	—
RE21-11-7881	21-614198	6–7	QBT3	NA	—	0.0856	0.173	NA	NA	NA	—	—	—
RE21-11-7882	21-614198	8–9	QBT3	NA	—	—	0.019 (J)	NA	NA	NA	—	—	—
RE21-11-7887	21-614201	6–7	QBT3	NA	—	0.203	0.435	NA	NA	NA	—	—	—
RE21-11-7888	21-614201	8–9	QBT3	NA	—	0.0847	0.178	NA	NA	NA	—	—	—
RE21-11-7889	21-614202	6–7	QBT3	NA	—	0.0225 (J)	0.0432	NA	NA	NA	—	—	—
RE21-11-7890	21-614202	8–9	QBT3	NA	—	—	0.013 (J)	NA	NA	NA	—	—	—
RE21-11-7891	21-614203	6–7	QBT3	NA	—	0.0248 (J)	0.0532	NA	NA	NA	—	—	—
RE21-11-7893	21-614204	6–7	QBT3	—	—	0.0703	0.0969	—	—	NA	—	—	—
RE21-11-7894	21-614204	8–9	QBT3	—	—	—	—	—	—	NA	—	—	—
RE21-11-7895	21-614205	6–7	QBT3	0.00000131 (J)	—	—	—	—	—	NA	—	—	—
RE21-11-7896	21-614205	8–9	QBT3	—	—	—	—	—	—	NA	—	—	—
RE21-11-7897	21-614206	6–7	QBT3	0.000000692 (J)	—	0.0198 (J)	0.0214 (J)	—	—	NA	—	—	—
RE21-11-7898	21-614206	8–9	QBT3	—	—	—	—	—	—	NA	—	—	—
RE21-11-7899	21-614207	6–7	QBT3	—	—	—	—	—	—	NA	—	—	—
RE21-11-7900	21-614207	8–9	QBT3	—	—	—	—	—	—	NA	—	—	—
RE21-11-7901	21-614208	6–7	QBT3	—	—	—	—	—	—	NA	0.000406 (J)	—	—
RE21-11-7902	21-614208	8–9	QBT3	—	—	—	—	—	—	NA	—	—	—
RE21-11-7903	21-614209	6–7	QBT3	—	—	—	—	—	—	NA	—	—	—
RE21-11-7905	21-614210	1–2	SOIL	NA	—	0.355	0.26	NA	NA	NA	—	—	—
RE21-11-7906	21-614210	3–4	QBT3	NA	—	0.385	0.265	NA	NA	NA	—	—	—
RE21-11-7907	21-614211	1–2	SOIL	NA	—	0.133	0.129	NA	NA	NA	—	—	—
RE21-11-7909	21-614212	1–2	SOIL	NA	—	0.108	0.136	NA	NA	NA	—	0.000892 (J)	0.00153 (J)
RE21-11-7910	21-614212	3–4	QBT3	NA	—	0.026 (J)	0.0844	NA	NA	NA	—	—	—
RE21-11-7913	21-614214	1–2	SOIL	NA	—	0.068	0.123	NA	NA	NA	—	—	—
RE21-11-7915	21-614215	1–2	SOIL	NA	—	—	—	NA	NA	NA	—	—	—

Table 7.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofurans (Totals)	Pentachlorophenol	Phenanthrene	Pyrene	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Total Petroleum Hydrocarbons Diesel Range Organics	Trimethylbenzene[1,2,4-]	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
Construction Worker SSL[a]				**na**	**1030**	**7150**	**6680**	**0.0127**	**na**	**na**	**688[e]**	**27500**	**3130[h]**
Industrial SSL[a]				**na**	**100**	**20500**	**18300**	**0.00147**	**na**	**200[i]**	**260[g]**	**31500**	**3610[h]**
Residential SSL[a]				**na**	**29.8**	**1830**	**1720**	**0.000374**	**na**	**200[i]**	**62[g]**	**9550**	**1090[h]**
RE21-11-7916	21-614215	3–4	QBT3	NA	—	0.0355 (J)	0.029 (J)	NA	NA	NA	—	—	—
RE21-11-7917	21-614216	1–2	SOIL	NA	—	0.0344 (J)	0.0344 (J)	NA	NA	NA	—	—	—
RE21-11-7918	21-614216	3–4	QBT3	NA	—	—	—	NA	NA	NA	—	—	—
RE21-11-7920	21-614217	3–4	SOIL	NA	—	—	—	NA	NA	NA	—	—	—
RE21-11-7923	21-614219	1–2	SOIL	NA	—	1.77 (J)	1.17 (J)	NA	NA	NA	—	—	—
RE21-11-7925	21-614220	1–2	SOIL	0.00000131 (J)	—	—	—	—	—	NA	—	—	—
RE21-11-7926	21-614220	3–4	QBT3	—	—	—	—	—	—	NA	—	—	—
RE21-11-7927	21-614221	1–2	SOIL	0.0000072	—	—	—	—	0.0000106 (J)	NA	—	—	—
RE21-11-7928	21-614221	3–4	SOIL	—	—	—	—	—	—	NA	—	—	—
RE21-11-7933	21-614222	1–2	SOIL	0.00000687	—	0.083	0.208	—	—	NA	—	—	—
RE21-11-7934	21-614222	3–4	QBT3	0.000000561 (J)	—	0.0615	0.0649	—	—	NA	—	—	—
RE21-11-7997	21-614222	5–6	QBT3	0.00000201 (J)	—	0.373	0.895	—	—	326	—	—	—
RE21-11-7936	21-614223	1–2	SOIL	0.000000575 (J)	—	0.0723	0.0723	—	—	NA	—	—	—
RE21-11-7937	21-614223	3–4	QBT3	0.00000054 (J)	—	0.0424	0.0447	—	—	NA	—	—	—
RE21-11-7938	21-614223	5–6	QBT3	—	—	—	—	—	—	NA	—	—	—
RE21-11-7939	21-614224	1–2	QBT3	—	—	—	—	—	—	NA	—	—	—
RE21-11-7940	21-614224	3–4	QBT3	—	—	0.0395	0.0422	—	—	NA	—	—	—
RE21-11-7941	21-614225	4–5	SOIL	0.0000026 (J)	—	0.0523 (J)	0.0545 (J)	—	—	NA	—	—	—
RE21-11-7942	21-614225	6–7	SOIL	0.0000453	—	1.31	1.48	0.00000313	0.0000349	NA	—	—	—
RE21-11-7963	21-614226	1–2	SOIL	NA	—	0.722 (J)	0.493 (J)	NA	NA	NA	—	—	—
RE21-11-7964	21-614226	3–4	SOIL	NA	—	0.0833 (J)	0.081 (J)	NA	NA	NA	—	—	—
RE21-11-7965	21-614226	5–6	QBT3	NA	—	0.0292 (J)	0.0587 (J)	NA	NA	NA	—	—	—
RE21-11-7966	21-614227	2–3	SOIL	NA	—	0.149	0.197	NA	NA	NA	—	—	—
RE21-11-7967	21-614227	4–5	QBT3	NA	—	0.0254 (J)	0.0269 (J)	NA	NA	NA	—	—	—
RE21-11-7968	21-614228	7–8	SOIL	NA	—	0.933	0.942	NA	NA	NA	—	—	—
RE21-11-7969	21-614228	9–10	QBT3	NA	—	0.296	0.369	NA	NA	NA	—	—	—

Table 7.1-11 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofurans (Totals)	Pentachlorophenol	Phenanthrene	Pyrene	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Total Petroleum Hydrocarbons Diesel Range Organics	Trimethylbenzene[1,2,4-]	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
Construction Worker SSL[a]				**na**	**1030**	**7150**	**6680**	**0.0127**	**na**	**na**	**688[e]**	**27500**	**3130[h]**
Industrial SSL[a]				**na**	**100**	**20500**	**18300**	**0.00147**	**na**	**200[i]**	**260[g]**	**31500**	**3610[h]**
Residential SSL[a]				**na**	**29.8**	**1830**	**1720**	**0.000374**	**na**	**200[i]**	**62[g]**	**9550**	**1090[h]**
RE21-11-7970	21-614229	7–8	SOIL	NA	—	0.169	0.244	NA	NA	NA	—	—	—
RE21-11-7971	21-614229	9–10	SOIL	NA	—	0.344	0.455	NA	NA	NA	—	—	—
RE21-11-7974	21-614231	1–2	QBT3	NA	—	0.135	0.146	NA	NA	NA	—	—	—
RE21-11-7975	21-614231	3–4	QBT3	NA	—	0.0129 (J)	0.0185 (J)	NA	NA	NA	—	—	—
RE21-11-7976	21-614232	1–2	QBT3	NA	—	0.0615	0.0794	NA	NA	NA	—	—	—
RE21-11-7977	21-614232	3–4	QBT3	NA	—	0.15	0.14	NA	NA	NA	—	—	—
RE21-11-7978	21-614233	4–5	SOIL	NA	—	12.8 (J)	8.84 (J)	NA	NA	NA	—	—	—
RE21-11-7979	21-614233	6–7	QBT3	NA	—	0.969 (J)	0.756 (J)	NA	NA	NA	—	—	—
RE21-11-7980	21-614234	4–5	SOIL	NA	—	0.0681 (J)	0.102 (J)	NA	NA	NA	—	—	—
RE21-11-7981	21-614234	6–7	QBT3	NA	—	0.162	0.178 (J)	NA	NA	NA	—	—	—

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

[a] SSLs are from NMED (2009, 108070) unless otherwise noted.

[b] Pyrene SSL used as surrogate based on structural similarity.

[c] — = Not detected.

[d] NA = Not analyzed.

[e] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2009, 108070).

[f] na = Not available.

[g] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[h] Xylenes SSL used as surrogate based on structural similarity.

[i] Screening guidelines for unknown oil are from NMED (2006, 094614).

Table 7.1-12
Radionuclides Detected or Detected above BVs/FVs
at Former Building 21-152 and Associated Former Structures Footprints

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-235/236
Qbt 2, 3, 4 BV/FV[a]				**na[b]**	**na**	**na**	**na**	**na**	**0.09**
Soil BV/FV[a]				**0.013**	**1.65**	**0.023**	**0.054**	**na**	**0.2**
Construction Worker SAL[c]				**34**	**18**	**40**	**36**	**320000**	**43**
Industrial SAL[c]				**180**	**23**	**240**	**210**	**440000**	**87**
Residential SAL[c]				**30**	**5.6**	**37**	**33**	**750**	**17**
RE21-11-7849	21-614182	6–7	QBT3	—[d]	—	—	—	0.595166	—
RE21-11-7850	21-614182	8–9	QBT3	—	—	—	—	0.428422	—
RE21-11-7851	21-614183	6–7	QBT3	—	—	—	—	1.27367	—
RE21-11-7852	21-614183	8–9	QBT3	—	—	—	—	0.466206	0.129
RE21-11-7853	21-614184	6–7	QBT3	—	—	—	—	1.46495	—
RE21-11-7854	21-614184	8–9	QBT3	—	—	—	—	0.589813	—
RE21-11-7855	21-614185	6–7	QBT3	—	—	—	—	1.09978	—
RE21-11-7856	21-614185	8–9	QBT3	—	—	—	—	0.511371	—
RE21-11-7857	21-614186	6–7	QBT3	—	—	—	—	2.36593	0.123
RE21-11-7858	21-614186	8–9	QBT3	—	—	—	—	1.399	—
RE21-11-7859	21-614187	6–7	SOIL	—	—	—	—	3.68172	—
RE21-11-7860	21-614187	8–9	QBT3	—	—	—	—	1.51572	—
RE21-11-7861	21-614188	6–7	QBT3	—	—	—	—	0.370506	—
RE21-11-7862	21-614188	8–9	QBT3	—	—	—	—	0.207561	—
RE21-11-7863	21-614189	6–7	SOIL	—	—	—	—	0.553256	—
RE21-11-7864	21-614189	8–9	QBT3	—	—	—	—	0.304067	—
RE21-11-7865	21-614190	6–7	QBT3	—	—	—	—	0.478447	—
RE21-11-7866	21-614190	8–9	QBT3	—	—	—	—	0.318071	—
RE21-11-7867	21-614191	6–7	QBT3	—	—	—	—	0.283333	—
RE21-11-7868	21-614191	8–9	QBT3	—	—	—	—	0.243974	—
RE21-11-7869	21-614192	6–7	SOIL	—	—	—	—	0.446224	—
RE21-11-7870	21-614192	8–9	QBT3	—	—	—	—	0.222492	—
RE21-11-7871	21-614193	6–7	QBT3	—	—	—	—	7.87	—
RE21-11-7872	21-614193	8–9	QBT3	—	—	—	—	6.03	—
RE21-11-7873	21-614194	6–7	QBT3	—	—	—	—	0.117029	—
RE21-11-7874	21-614194	8–9	QBT3	—	—	—	—	0.129337	—
RE21-11-7875	21-614195	6–7	QBT3	—	—	—	—	0.0740691	—

Table 7.1-12 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-235/236
Qbt 2, 3, 4 BV/FV[a]				**na[b]**	**na**	**na**	**na**	**na**	**0.09**
Soil BV/FV[a]				**0.013**	**1.65**	**0.023**	**0.054**	**na**	**0.2**
Construction Worker SAL[c]				**34**	**18**	**40**	**36**	**320000**	**43**
Industrial SAL[c]				**180**	**23**	**240**	**210**	**440000**	**87**
Residential SAL[c]				**30**	**5.6**	**37**	**33**	**750**	**17**
RE21-11-7876	21-614195	8–9	QBT3	—	—	—	—	0.0722334	—
RE21-11-7877	21-614196	6–7	QBT3	—	—	—	—	0.116516	—
RE21-11-7878	21-614196	8–9	QBT3	—	—	—	—	0.0988196	—
RE21-11-7879	21-614197	6–7	QBT3	—	—	—	—	0.177584	—
RE21-11-7880	21-614197	8–9	QBT3	—	—	—	—	0.131801	—
RE21-11-7881	21-614198	6–7	QBT3	—	—	—	—	0.598347	—
RE21-11-7882	21-614198	8–9	QBT3	—	—	—	—	0.497143	—
RE21-11-7883	21-614199	6–7	QBT3	—	—	—	—	0.473487	—
RE21-11-7884	21-614199	8–9	QBT3	—	—	—	—	0.271498	—
RE21-11-7885	21-614200	6–7	QBT3	—	—	—	—	0.0895801	—
RE21-11-7886	21-614200	8–9	QBT3	—	—	—	—	0.0524307	—
RE21-11-7887	21-614201	6–7	QBT3	—	—	—	—	0.277931	0.0982
RE21-11-7888	21-614201	8–9	QBT3	—	—	—	—	0.232262	—
RE21-11-7889	21-614202	6–7	QBT3	—	—	—	—	1.68358	—
RE21-11-7890	21-614202	8–9	QBT3	—	—	—	—	0.854514	—
RE21-11-7891	21-614203	6–7	QBT3	—	—	—	—	50.2084	—
RE21-11-7892	21-614203	8–9	QBT3	—	—	—	—	44.0567	—
RE21-11-7893	21-614204	6–7	QBT3	—	—	—	—	0.300247	—
RE21-11-7894	21-614204	8–9	QBT3	—	—	—	—	0.478431	—
RE21-11-7895	21-614205	6–7	QBT3	—	—	—	—	0.760918	—
RE21-11-7896	21-614205	8–9	QBT3	—	—	—	—	0.614172	—
RE21-11-7897	21-614206	6–7	QBT3	—	—	—	—	0.38379	—
RE21-11-7898	21-614206	8–9	QBT3	—	—	—	—	0.38202	—
RE21-11-7899	21-614207	6–7	QBT3	—	—	—	—	0.787859	—
RE21-11-7900	21-614207	8–9	QBT3	—	—	—	—	0.59847	—
RE21-11-7903	21-614209	6–7	QBT3	—	—	—	—	0.50538	—
RE21-11-7904	21-614209	8–9	QBT3	—	—	—	—	0.63193	—
RE21-11-7905	21-614210	1–2	SOIL	—	—	—	—	1.48419	—
RE21-11-7906	21-614210	3–4	QBT3	—	—	—	—	2.98877	—

Table 7.1-12 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-235/236
Qbt 2, 3, 4 BV/FV[a]				**na[b]**	**na**	**na**	**na**	**na**	**0.09**
Soil BV/FV[a]				**0.013**	**1.65**	**0.023**	**0.054**	**na**	**0.2**
Construction Worker SAL[c]				**34**	**18**	**40**	**36**	**320000**	**43**
Industrial SAL[c]				**180**	**23**	**240**	**210**	**440000**	**87**
Residential SAL[c]				**30**	**5.6**	**37**	**33**	**750**	**17**
RE21-11-7907	21-614211	1–2	SOIL	—	—	—	—	0.706499	—
RE21-11-7908	21-614211	3–4	QBT3	—	—	—	—	5.24483	—
RE21-11-7909	21-614212	1–2	SOIL	—	—	—	—	0.915859	—
RE21-11-7910	21-614212	3–4	QBT3	—	—	—	—	1.24521	—
RE21-11-7911	21-614213	1–2	SOIL	—	—	—	—	2.11946	—
RE21-11-7912	21-614213	3–4	QBT3	—	—	—	—	1.7847	—
RE21-11-7913	21-614214	1–2	SOIL	—	—	—	—	0.759177	—
RE21-11-7914	21-614214	3–4	SOIL	—	—	—	—	1.85047	—
RE21-11-7915	21-614215	1–2	SOIL	—	—	—	—	0.780334	—
RE21-11-7916	21-614215	3–4	QBT3	—	—	—	—	0.643987	—
RE21-11-7917	21-614216	1–2	SOIL	—	—	—	—	1.24533	—
RE21-11-7918	21-614216	3–4	QBT3	—	—	—	—	2.14311	—
RE21-11-7919	21-614217	1–2	SOIL	—	—	—	—	0.477734	—
RE21-11-7920	21-614217	3–4	SOIL	—	—	—	—	0.439507	—
RE21-11-7921	21-614218	1–2	SOIL	—	—	—	—	16.2956	—
RE21-11-7922	21-614218	3–4	SOIL	—	—	—	—	23.6744	—
RE21-11-7923	21-614219	1–2	SOIL	—	—	—	—	1.20961	—
RE21-11-7924	21-614219	3–4	QBT3	—	—	—	—	3.72273	—
RE21-11-7925	21-614220	1–2	SOIL	—	—	—	—	1.51571	—
RE21-11-7926	21-614220	3–4	QBT3	—	—	—	—	2.76317	—
RE21-11-7927	21-614221	1–2	SOIL	—	—	—	—	0.791839	—
RE21-11-7928	21-614221	3–4	SOIL	—	—	—	—	1.00119	—
RE21-11-7933	21-614222	1–2	SOIL	—	—	—	—	3.5162	—
RE21-11-7934	21-614222	3–4	QBT3	—	—	—	—	8.17438	—
RE21-11-7997	21-614222	5–6	QBT3	—	—	—	—	5.18573	—
RE21-11-7936	21-614223	1–2	SOIL	—	—	—	—	2.71004	—
RE21-11-7937	21-614223	3–4	QBT3	—	—	—	—	1.82883	—
RE21-11-7938	21-614223	5–6	QBT3	—	—	—	—	0.869615	—
RE21-11-7939	21-614224	1–2	QBT3	—	—	—	—	0.669187	0.106

Table 7.1-12 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-235/236
Qbt 2, 3, 4 BV/FV[a]				**na[b]**	**na**	**na**	**na**	**na**	**0.09**
Soil BV/FV[a]				**0.013**	**1.65**	**0.023**	**0.054**	**na**	**0.2**
Construction Worker SAL[c]				**34**	**18**	**40**	**36**	**320000**	**43**
Industrial SAL[c]				**180**	**23**	**240**	**210**	**440000**	**87**
Residential SAL[c]				**30**	**5.6**	**37**	**33**	**750**	**17**
RE21-11-7940	21-614224	3–4	QBT3	—	—	—	—	0.474048	0.126
RE21-11-7941	21-614225	4–5	SOIL	—	—	—	—	0.0747097	—
RE21-11-7942	21-614225	6–7	SOIL	0.0408	0.176	0.0166	0.195	0.200804	—
RE21-11-7963	21-614226	1–2	SOIL	—	—	—	—	1.42344	—
RE21-11-7964	21-614226	3–4	SOIL	—	—	—	—	3.14572	—
RE21-11-7965	21-614226	5–6	QBT3	—	—	—	—	2.37024	—
RE21-11-7966	21-614227	2–3	SOIL	—	—	—	0.0258	13.6776	—
RE21-11-7967	21-614227	4–5	QBT3	—	—	—	—	3.60517	—
RE21-11-7968	21-614228	7–8	SOIL	—	—	—	0.0351	0.826764	—
RE21-11-7969	21-614228	9–10	QBT3	—	—	—	—	0.688876	—
RE21-11-7970	21-614229	7–8	SOIL	—	—	—	—	0.172763	—
RE21-11-7971	21-614229	9–10	SOIL	—	—	—	0.0922	0.168908	—
RE21-11-7972	21-614230	7–8	QBT3	—	—	—	—	2.09202	—
RE21-11-7973	21-614230	9–10	QBT3	—	—	—	—	1.96927	—
RE21-11-7974	21-614231	1–2	QBT3	—	—	—	0.023	3.2632	0.0928
RE21-11-7975	21-614231	3–4	QBT3	—	—	—	—	2.96596	—
RE21-11-7976	21-614232	1–2	QBT3	—	—	—	—	6.34439	—
RE21-11-7977	21-614232	3–4	QBT3	—	—	—	—	4.75893	—
RE21-11-7978	21-614233	4–5	SOIL	—	—	—	0.0284	0.476075	—
RE21-11-7979	21-614233	6–7	QBT3	—	—	—	—	0.31676	—
RE21-11-7980	21-614234	4–5	SOIL	—	—	—	0.0748	0.162583	—
RE21-11-7981	21-614234	6–7	QBT3	—	—	—	—	0.25699	—
RE21-11-7982	21-614235	0.5–1.5	SOIL	—	—	—	—	26.3182	—
RE21-11-7983	21-614235	2.5–3.5	SOIL	—	—	—	—	7.01303	—
RE21-11-7984	21-614236	0.5–1.5	SOIL	—	—	—	—	1.04607	—
RE21-11-7985	21-614236	2.5–3.5	QBT3	—	—	—	—	0.825865	—
RE21-11-7986	21-614237	0–1	QBT3	—	—	—	—	4.66981	—
RE21-11-7987	21-614237	2–3	QBT3	—	—	—	—	4.7194	—
RE21-11-7988	21-614238	5–6	QBT3	—	—	—	—	0.79224	—

Table 7.1-12 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-235/236
Qbt 2, 3, 4 BV/FV[a]				**na[b]**	**na**	**na**	**na**	**na**	**0.09**
Soil BV/FV[a]				**0.013**	**1.65**	**0.023**	**0.054**	**na**	**0.2**
Construction Worker SAL[c]				**34**	**18**	**40**	**36**	**320000**	**43**
Industrial SAL[c]				**180**	**23**	**240**	**210**	**440000**	**87**
Residential SAL[c]				**30**	**5.6**	**37**	**33**	**750**	**17**
RE21-11-7989	21-614238	9–10	QBT3	—	—	—	—	0.415037	—
RE21-11-7990	21-614238	14–15	QBT3	—	—	—	—	0.394554	—
RE21-11-7991	21-614239	5–6	SOIL	—	—	—	0.233	0.432062	—
RE21-11-7992	21-614239	9–10	QBT3	—	—	—	0.0375	0.237136	—
RE21-11-7993	21-614239	14–15	QBT3	—	—	—	—	0.278025	—
RE21-11-7994	21-614240	5–6	QBT3	—	—	—	—	0.213986	—
RE21-11-7995	21-614240	9–10	QBT3	—	—	—	—	0.23099	—
RE21-11-7996	21-614240	14–15	QBT3	—	—	—	—	0.165666	—

Note: Results are in pCi/g.

[a] BVs/FVs are from LANL (1998, 059730).

[b] na = Not available.

[c] SALs are from LANL (2009, 107655).

[d] — = Not detected or not detected above BV/FV.

Table 7.1-13
Samples Collected and Analyses Requested at Former Building 21-155 and Associated Former Structures Footprints

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Asbestos	Dioxins/Furans	Gamma-Emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE21-11-5778	21-613977	2–3	SOIL	11-1686	11-1687	11-1688	—*	11-1686	11-1686	—	11-1686	11-1686	11-1686	11-1687	—	11-1687	11-1686	11-1685	11-1686	11-1685	11-1687
RE21-11-5777	21-613977	4–5	SOIL	11-1686	11-1687	11-1688	—	11-1686	11-1686	—	11-1686	11-1686	11-1686	11-1687	—	11-1687	11-1686	11-1685	11-1686	11-1685	11-1687
RE21-11-5779	21-613978	2–3	QBT3	11-1686	11-1687	11-1688	—	11-1686	11-1686	—	11-1686	11-1686	11-1686	11-1687	—	11-1687	11-1686	11-1685	11-1686	11-1685	11-1687
RE21-11-5780	21-613978	4–5	QBT3	11-1686	11-1687	11-1688	—	11-1686	11-1686	—	11-1686	11-1686	11-1686	11-1687	—	11-1687	11-1686	11-1685	11-1686	11-1685	11-1687
RE21-11-5781	21-613979	5–6	SOIL	11-1686	11-1687	11-1688	—	11-1686	11-1686	—	11-1686	11-1686	11-1686	11-1687	—	11-1687	11-1686	11-1685	11-1686	11-1685	11-1687
RE21-11-5782	21-613979	7–8	QBT3	11-1686	11-1687	11-1688	—	11-1686	11-1686	—	11-1686	11-1686	11-1686	11-1687	—	11-1687	11-1686	11-1685	11-1686	11-1685	11-1687
RE21-11-5783	21-613980	6–7	SOIL	11-1737	11-1737	11-1735	—	11-1737	11-1737	—	11-1737	11-1737	11-1737	11-1737	—	11-1737	11-1737	11-1734	11-1737	11-1734	11-1737
RE21-11-5784	21-613980	8–9	SOIL	11-1737	11-1737	11-1735	—	11-1737	11-1737	—	11-1737	11-1737	11-1737	11-1737	—	11-1737	11-1737	11-1734	11-1737	11-1734	11-1737
RE21-11-5785	21-613981	6–7	SOIL	11-1737	11-1737	11-1735	—	11-1737	11-1737	—	11-1737	11-1737	11-1737	11-1737	—	11-1737	11-1737	11-1734	11-1737	11-1734	11-1737
RE21-11-5786	21-613981	8–9	QBT3	11-1737	11-1737	11-1735	—	11-1737	11-1737	—	11-1737	11-1737	11-1737	11-1737	—	11-1737	11-1737	11-1734	11-1737	11-1734	11-1737
RE21-11-5787	21-613982	6–7	SOIL	11-1761	11-1761	11-1760	—	11-1761	11-1761	—	11-1761	11-1761	11-1761	11-1761	—	11-1761	11-1761	11-1758	11-1761	11-1758	11-1761
RE21-11-5788	21-613982	8–9	SOIL	11-1761	11-1761	11-1760	—	11-1761	11-1761	—	11-1761	11-1761	11-1761	11-1761	—	11-1761	11-1761	11-1758	11-1761	11-1758	11-1761
RE21-11-5789	21-613983	6–7	QBT3	11-1761	11-1761	11-1760	—	11-1761	11-1761	—	11-1761	11-1761	11-1761	11-1761	—	11-1761	11-1761	11-1758	11-1761	11-1758	11-1761
RE21-11-5790	21-613983	8–9	QBT3	11-1761	11-1761	11-1760	—	11-1761	11-1761	—	11-1761	11-1761	11-1761	11-1761	—	11-1761	11-1761	11-1758	11-1761	11-1758	11-1761
RE21-11-5791	21-613984	6–7	QBT3	11-1774	11-1774	11-1776	—	11-1774	11-1774	—	11-1774	11-1774	11-1774	11-1774	—	11-1774	11-1774	11-1775	11-1774	11-1775	11-1774
RE21-11-5792	21-613984	8–9	QBT3	11-1774	11-1774	11-1776	—	11-1774	11-1774	—	11-1774	11-1774	11-1774	11-1774	—	11-1774	11-1774	11-1775	11-1774	11-1775	11-1774
RE21-11-5793	21-613985	6–7	QBT3	11-1774	11-1774	11-1776	—	11-1774	11-1774	—	11-1774	11-1774	11-1774	11-1774	—	11-1774	11-1774	11-1775	11-1774	11-1775	11-1774
RE21-11-5794	21-613985	8–9	QBT3	11-1774	11-1774	11-1776	—	11-1774	11-1774	—	11-1774	11-1774	11-1774	11-1774	—	11-1774	11-1774	11-1775	11-1774	11-1775	11-1774
RE21-11-5795	21-613986	6–7	SOIL	11-1774	11-1774	11-1776	—	11-1774	11-1774	—	11-1774	11-1774	11-1774	11-1774	—	11-1774	11-1774	11-1775	11-1774	11-1775	11-1774
RE21-11-5796	21-613986	8–9	QBT3	11-1774	11-1774	11-1776	—	11-1774	11-1774	—	11-1774	11-1774	11-1774	11-1774	—	11-1774	11-1774	11-1775	11-1774	11-1775	11-1774
RE21-11-5797	21-613987	6–7	SOIL	11-1798	11-1796	11-1797	—	11-1798	11-1798	—	11-1798	11-1798	11-1798	11-1796	—	11-1796	11-1798	11-1795	11-1798	11-1795	11-1796
RE21-11-5798	21-613987	8–9	QBT3	11-1798	11-1796	11-1797	—	11-1798	11-1798	—	11-1798	11-1798	11-1798	11-1796	—	11-1796	11-1798	11-1795	11-1798	11-1795	11-1796
RE21-11-5799	21-613988	6–7	SOIL	11-1798	11-1796	11-1797	—	11-1798	11-1798	—	11-1798	11-1798	11-1798	11-1796	—	11-1796	11-1798	11-1795	11-1798	11-1795	11-1796
RE21-11-5800	21-613988	8–9	QBT3	11-1798	11-1796	11-1797	—	11-1798	11-1798	—	11-1798	11-1798	11-1798	11-1796	—	11-1796	11-1798	11-1795	11-1798	11-1795	11-1796
RE21-11-5801	21-613989	1–2	SOIL	11-1679	11-1679	—	—	11-1679	11-1679	—	11-1679	11-1679	11-1679	11-1679	—	11-1679	11-1679	11-1679	11-1679	11-1679	11-1679
RE21-11-5802	21-613989	3–4	SOIL	11-1679	11-1679	—	—	11-1679	11-1679	—	11-1679	11-1679	11-1679	11-1679	—	11-1679	11-1679	11-1679	11-1679	11-1679	11-1679
RE21-11-5803	21-613990	1–2	SOIL	11-1686	11-1687	—	—	11-1686	11-1686	—	11-1686	11-1686	11-1686	11-1687	—	11-1687	11-1686	11-1685	11-1686	11-1685	11-1687
RE21-11-5804	21-613990	3–4	QBT3	11-1686	11-1687	—	—	11-1686	11-1686	—	11-1686	11-1686	11-1686	11-1687	—	11-1687	11-1686	11-1685	11-1686	11-1685	11-1687
RE21-11-5805	21-613991	1–2	SOIL	11-1686	11-1687	—	—	11-1686	11-1686	—	11-1686	11-1686	11-1686	11-1687	—	11-1687	11-1686	11-1685	11-1686	11-1685	11-1687
RE21-11-5806	21-613991	3–4	SOIL	11-1686	11-1687	—	—	11-1686	11-1686	—	11-1686	11-1686	11-1686	11-1687	—	11-1687	11-1686	11-1685	11-1686	11-1685	11-1687
RE21-11-5807	21-613992	1–2	SOIL	11-1686	11-1687	—	—	11-1686	11-1686	—	11-1686	11-1686	11-1686	11-1687	—	11-1687	11-1686	11-1685	11-1686	11-1685	11-1687
RE21-11-5808	21-613992	3–4	SOIL	11-1686	11-1687	—	—	11-1686	11-1686	—	11-1686	11-1686	11-1686	11-1687	—	11-1687	11-1686	11-1685	11-1686	11-1685	11-1687
RE21-11-5809	21-613993	1–2	SOIL	11-1894	11-1892	—	—	11-1894	11-1894	—	11-1894	11-1894	11-1894	11-1892	—	11-1892	11-1894	11-1891	11-1894	11-1891	11-1892

Table 7.1-13 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Asbestos	Dioxins/Furans	Gamma-Emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE21-11-5810	21-613993	3–4	SOIL	11-1894	11-1892	—	—	11-1894	11-1894	—	11-1894	11-1894	11-1894	11-1892	—	11-1892	11-1894	11-1891	11-1894	11-1891	11-1892
RE21-11-5811	21-613994	1–2	SOIL	11-1919	11-1917	—	—	11-1919	11-1919	—	11-1919	11-1919	11-1919	11-1917	—	11-1917	11-1919	11-1916	11-1919	11-1916	11-1917
RE21-11-5812	21-613994	3–4	SOIL	11-1919	11-1917	—	—	11-1919	11-1919	—	11-1919	11-1919	11-1919	11-1917	—	11-1917	11-1919	11-1916	11-1919	11-1916	11-1917
RE21-11-5813	21-613995	1–2	SOIL	11-1919	11-1917	—	—	11-1919	11-1919	—	11-1919	11-1919	11-1919	11-1917	—	11-1917	11-1919	11-1916	11-1919	11-1916	11-1917
RE21-11-5814	21-613995	3–4	SOIL	11-1919	11-1917	—	—	11-1919	11-1919	—	11-1919	11-1919	11-1919	11-1917	—	11-1917	11-1919	11-1916	11-1919	11-1916	11-1917
RE21-11-5815	21-613996	5–6	SOIL	11-1704	11-1703	11-1705	11-1706	11-1704	11-1704	11-1702	11-1704	11-1704	11-1704	11-1703	11-1702	11-1703	11-1704	11-1702	11-1704	11-1702	11-1703
RE21-11-5816	21-613996	7–8	QBT3	11-1704	11-1703	11-1705	11-1706	11-1704	11-1704	11-1702	11-1704	11-1704	11-1704	11-1703	11-1702	11-1703	11-1704	11-1702	11-1704	11-1702	11-1703
RE21-11-5817	21-613997	6–7	QBT3	11-1704	11-1703	11-1705	11-1706	11-1704	11-1704	11-1702	11-1704	11-1704	11-1704	11-1703	11-1702	11-1703	11-1704	11-1702	11-1704	11-1702	11-1703
RE21-11-5818	21-613997	8–9	QBT3	11-1704	11-1703	11-1705	11-1706	11-1704	11-1704	11-1702	11-1704	11-1704	11-1704	11-1703	11-1702	11-1703	11-1704	11-1702	11-1704	11-1702	11-1703
RE21-11-5819	21-613998	6–7	SOIL	11-1737	11-1737	11-1735	11-1736	11-1737	11-1737	11-1734	11-1737	11-1737	11-1737	11-1737	11-1734	11-1737	11-1737	11-1734	11-1737	11-1734	11-1737
RE21-11-5820	21-613998	8–9	QBT3	11-1737	11-1737	11-1735	11-1736	11-1737	11-1737	11-1734	11-1737	11-1737	11-1737	11-1737	11-1734	11-1737	11-1737	11-1734	11-1737	11-1734	11-1737
RE21-11-5821	21-613999	6–7	SOIL	11-1761	11-1761	11-1760	11-1759	11-1761	11-1761	11-1758	11-1761	11-1761	11-1761	11-1761	11-1758	11-1761	11-1761	11-1758	11-1761	11-1758	11-1761
RE21-11-5822	21-613999	8–9	QBT3	11-1761	11-1761	11-1760	11-1759	11-1761	11-1761	11-1758	11-1761	11-1761	11-1761	11-1761	11-1758	11-1761	11-1761	11-1758	11-1761	11-1758	11-1761
RE21-11-5823	21-614000	6–7	SOIL	11-1761	11-1761	11-1760	11-1759	11-1761	11-1761	11-1758	11-1761	11-1761	11-1761	11-1761	11-1758	11-1761	11-1761	11-1758	11-1761	11-1758	11-1761
RE21-11-5824	21-614000	8–9	QBT3	11-1761	11-1761	11-1760	11-1759	11-1761	11-1761	11-1758	11-1761	11-1761	11-1761	11-1761	11-1758	11-1761	11-1761	11-1758	11-1761	11-1758	11-1761
RE21-11-5825	21-614001	20–21	QBT3	11-2039	11-2039	—	11-2040	11-2039	11-2039	11-2039	11-2039	11-2039	11-2039	11-2039	11-2039	11-2039	11-2039	11-2039	11-2039	11-2039	11-2039
RE21-11-5826	21-614001	30–31	QBT3	11-2039	11-2039	—	11-2040	11-2039	11-2039	11-2039	11-2039	11-2039	11-2039	11-2039	11-2039	11-2039	11-2039	11-2039	11-2039	11-2039	11-2039
RE21-11-5827	21-614002	5–6	SOIL	11-1798	11-1796	11-1797	—	11-1798	11-1798	—	11-1798	11-1798	11-1798	11-1796	—	11-1796	11-1798	11-1795	11-1798	11-1795	11-1796
RE21-11-5828	21-614002	7–8	SOIL	11-1798	11-1796	11-1797	—	11-1798	11-1798	—	11-1798	11-1798	11-1798	11-1796	—	11-1796	11-1798	11-1795	11-1798	11-1795	11-1796
RE21-11-5829	21-614003	5–6	SOIL	11-1826	11-1825	11-1827	—	11-1826	11-1826	—	11-1826	11-1826	11-1826	11-1825	—	11-1825	11-1826	11-1824	11-1826	11-1824	11-1825
RE21-11-5830	21-614003	7–8	QBT3	11-1826	11-1825	11-1827	—	11-1826	11-1826	—	11-1826	11-1826	11-1826	11-1825	—	11-1825	11-1826	11-1824	11-1826	11-1824	11-1825
RE21-11-5831	21-614004	5–6	QBT3	11-1826	11-1825	11-1827	—	11-1826	11-1826	—	11-1826	11-1826	11-1826	11-1825	—	11-1825	11-1826	11-1824	11-1826	11-1824	11-1825
RE21-11-5832	21-614004	7–8	QBT3	11-1826	11-1825	11-1827	—	11-1826	11-1826	—	11-1826	11-1826	11-1826	11-1825	—	11-1825	11-1826	11-1824	11-1826	11-1824	11-1825
RE21-11-5833	21-614005	5–6	QBT3	11-1826	11-1825	11-1827	—	11-1826	11-1826	—	11-1826	11-1826	11-1826	11-1825	—	11-1825	11-1826	11-1824	11-1826	11-1824	11-1825
RE21-11-5834	21-614005	7–8	QBT3	11-1826	11-1825	11-1827	—	11-1826	11-1826	—	11-1826	11-1826	11-1826	11-1825	—	11-1825	11-1826	11-1824	11-1826	11-1824	11-1825
RE21-11-5835	21-614006	5–6	QBT3	11-1837	11-1836	11-1838	—	11-1837	11-1837	—	11-1837	11-1837	11-1837	11-1836	—	11-1836	11-1837	11-1835	11-1837	11-1835	11-1836
RE21-11-5836	21-614006	7–8	QBT3	11-1837	11-1836	11-1838	—	11-1837	11-1837	—	11-1837	11-1837	11-1837	11-1836	—	11-1836	11-1837	11-1835	11-1837	11-1835	11-1836
RE21-11-5837	21-614007	5–6	SOIL	11-1837	11-1836	11-1838	—	11-1837	11-1837	—	11-1837	11-1837	11-1837	11-1836	—	11-1836	11-1837	11-1835	11-1837	11-1835	11-1836
RE21-11-5838	21-614007	7–8	QBT3	11-1837	11-1836	11-1838	—	11-1837	11-1837	—	11-1837	11-1837	11-1837	11-1836	—	11-1836	11-1837	11-1835	11-1837	11-1835	11-1836
RE21-11-5839	21-614008	5–6	QBT3	11-1860	11-1857	11-1859	—	11-1860	11-1860	—	11-1860	11-1860	11-1860	11-1857	—	11-1857	11-1860	11-1856	11-1860	11-1856	11-1857
RE21-11-5840	21-614008	7–8	QBT3	11-1860	11-1857	11-1859	—	11-1860	11-1860	—	11-1860	11-1860	11-1860	11-1857	—	11-1857	11-1860	11-1856	11-1860	11-1856	11-1857
RE21-11-5841	21-614009	5–6	QBT3	11-1860	11-1857	11-1859	—	11-1860	11-1860	—	11-1860	11-1860	11-1860	11-1857	—	11-1857	11-1860	11-1856	11-1860	11-1856	11-1857
RE21-11-5842	21-614009	7–8	QBT3	11-1860	11-1857	11-1859	—	11-1860	11-1860	—	11-1860	11-1860	11-1860	11-1857	—	11-1857	11-1860	11-1856	11-1860	11-1856	11-1857
RE21-11-5843	21-614010	5–6	QBT3	11-1919	11-1917	11-1918	—	11-1919	11-1919	—	11-1919	11-1919	11-1919	11-1917	—	11-1917	11-1919	11-1916	11-1919	11-1916	11-1917
RE21-11-5844	21-614010	7–8	QBT3	11-1919	11-1917	11-1918	—	11-1919	11-1919	—	11-1919	11-1919	11-1919	11-1917	—	11-1917	11-1919	11-1916	11-1919	11-1916	11-1917

Table 7.1-13 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Asbestos	Dioxins/Furans	Gamma-Emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE21-11-5845	21-614011	5–6	QBT3	11-1826	11-1825	11-1827	11-1828	11-1826	11-1826	11-1824	11-1826	11-1826	11-1826	11-1825	11-1824	11-1825	11-1826	11-1824	11-1826	11-1824	11-1825
RE21-11-5846	21-614011	7–8	QBT3	11-1826	11-1825	11-1827	11-1828	11-1826	11-1826	11-1824	11-1826	11-1826	11-1826	11-1825	11-1824	11-1825	11-1826	11-1824	11-1826	11-1824	11-1825
RE21-11-5847	21-614012	5–6	QBT3	11-1826	11-1825	11-1827	11-1828	11-1826	11-1826	11-1824	11-1826	11-1826	11-1826	11-1825	11-1824	11-1825	11-1826	11-1824	11-1826	11-1824	11-1825
RE21-11-5848	21-614012	7–8	QBT3	11-1826	11-1825	11-1827	11-1828	11-1826	11-1826	11-1824	11-1826	11-1826	11-1826	11-1825	11-1824	11-1825	11-1826	11-1824	11-1826	11-1824	11-1825
RE21-11-5849	21-614013	5–6	QBT3	11-1860	11-1857	11-1859	11-1858	11-1860	11-1860	11-1856	11-1860	11-1860	11-1860	11-1857	11-1856	11-1857	11-1860	11-1856	11-1860	11-1856	11-1857
RE21-11-5850	21-614013	7–8	QBT3	11-1860	11-1857	11-1859	11-1858	11-1860	11-1860	11-1856	11-1860	11-1860	11-1860	11-1857	11-1856	11-1857	11-1860	11-1856	11-1860	11-1856	11-1857
RE21-11-5851	21-614014	5–6	QBT3	11-1860	11-1857	11-1859	11-1858	11-1860	11-1860	11-1856	11-1860	11-1860	11-1860	11-1857	11-1856	11-1857	11-1860	11-1856	11-1860	11-1856	11-1857
RE21-11-5852	21-614014	7–8	QBT3	11-1860	11-1857	11-1859	11-1858	11-1860	11-1860	11-1856	11-1860	11-1860	11-1860	11-1857	11-1856	11-1857	11-1860	11-1856	11-1860	11-1856	11-1857
RE21-11-5853	21-614015	12–13	QBT3	11-1894	11-1892	—	11-1893	11-1894	11-1894	11-1891	11-1894	11-1894	11-1894	11-1892	11-1891	11-1892	11-1894	11-1891	11-1894	11-1891	11-1892
RE21-11-5854	21-614015	16–17	QBT3	11-1894	11-1892	—	11-1893	11-1894	11-1894	11-1891	11-1894	11-1894	11-1894	11-1892	11-1891	11-1892	11-1894	11-1891	11-1894	11-1891	11-1892
RE21-11-5855	21-614015	21–22	QBT3	11-1894	11-1892	—	11-1893	11-1894	11-1894	11-1891	11-1894	11-1894	11-1894	11-1892	11-1891	11-1892	11-1894	11-1891	11-1894	11-1891	11-1892
RE21-11-5856	21-614016	1–2	SOIL	11-1919	11-1917	—	—	11-1919	11-1919	—	11-1919	11-1919	11-1919	11-1917	—	11-1917	11-1919	11-1916	11-1919	11-1916	11-1917
RE21-11-5857	21-614016	3–4	SOIL	11-1919	11-1917	—	—	11-1919	11-1919	—	11-1919	11-1919	11-1919	11-1917	—	11-1917	11-1919	11-1916	11-1919	11-1916	11-1917
RE21-11-5858	21-614017	1–2	SOIL	11-1919	11-1917	—	—	11-1919	11-1919	—	11-1919	11-1919	11-1919	11-1917	—	11-1917	11-1919	11-1916	11-1919	11-1916	11-1917
RE21-11-5859	21-614017	3–4	SOIL	11-1919	11-1917	—	—	11-1919	11-1919	—	11-1919	11-1919	11-1919	11-1917	—	11-1917	11-1919	11-1916	11-1919	11-1916	11-1917
RE21-11-5860	21-614018	1–2	SOIL	11-1919	11-1917	—	—	11-1919	11-1919	—	11-1919	11-1919	11-1919	11-1917	—	11-1917	11-1919	11-1916	11-1919	11-1916	11-1917
RE21-11-5861	21-614018	3–4	SOIL	11-1919	11-1917	—	—	11-1919	11-1919	—	11-1919	11-1919	11-1919	11-1917	—	11-1917	11-1919	11-1916	11-1919	11-1916	11-1917
RE21-11-5862	21-614019	1–2	SOIL	11-1940	11-1939	—	—	11-1940	11-1940	—	11-1940	11-1940	11-1940	11-1939	—	11-1939	11-1940	11-1938	11-1940	11-1938	11-1939
RE21-11-5863	21-614019	3–4	SOIL	11-1940	11-1939	—	—	11-1940	11-1940	—	11-1940	11-1940	11-1940	11-1939	—	11-1939	11-1940	11-1938	11-1940	11-1938	11-1939
RE21-11-5864	21-614020	4–5	QBT3	11-1940	11-1939	—	—	11-1940	11-1940	—	11-1940	11-1940	11-1940	11-1939	—	11-1939	11-1940	11-1938	11-1940	11-1938	11-1939
RE21-11-5865	21-614020	6–7	QBT3	11-1940	11-1939	—	—	11-1940	11-1940	—	11-1940	11-1940	11-1940	11-1939	—	11-1939	11-1940	11-1938	11-1940	11-1938	11-1939
RE21-11-5866	21-614021	4–5	SOIL	11-2421	11-2421	—	—	11-2421	11-2421	—	11-2421	11-2421	11-2421	11-2421	—	11-2421	11-2421	11-2421	11-2421	11-2421	11-2421
RE21-11-5867	21-614021	6–7	SOIL	11-2421	11-2421	—	—	11-2421	11-2421	—	11-2421	11-2421	11-2421	11-2421	—	11-2421	11-2421	11-2421	11-2421	11-2421	11-2421
RE21-11-5868	21-614022	4–5	QBT3	11-2488	11-2487	—	—	11-2488	11-2488	—	11-2488	11-2488	11-2488	11-2487	—	11-2487	11-2488	11-2486	11-2488	11-2486	11-2487
RE21-11-5869	21-614022	7–8	QBT3	11-2488	11-2487	—	—	11-2488	11-2488	—	11-2488	11-2488	11-2488	11-2487	—	11-2487	11-2488	11-2486	11-2488	11-2486	11-2487
RE21-11-5870	21-614023	6–7	QBT3	11-2488	11-2487	—	—	11-2488	11-2488	—	11-2488	11-2488	11-2488	11-2487	—	11-2487	11-2488	11-2486	11-2488	11-2486	11-2487
RE21-11-5871	21-614023	8–9	QBT3	11-2488	11-2487	—	—	11-2488	11-2488	—	11-2488	11-2488	11-2488	11-2487	—	11-2487	11-2488	11-2486	11-2488	11-2486	11-2487
RE21-11-5872	21-614024	1–2	SOIL	11-2131	11-2129	11-2130	—	11-2131	11-2131	—	11-2131	11-2131	11-2131	11-2129	—	11-2129	11-2131	11-2128	11-2131	11-2128	11-2129
RE21-11-5873	21-614024	3–4	SOIL	11-2131	11-2129	11-2130	—	11-2131	11-2131	—	11-2131	11-2131	11-2131	11-2129	—	11-2129	11-2131	11-2128	11-2131	11-2128	11-2129
RE21-11-5874	21-614025	1–2	SOIL	11-2137	11-2137	11-2226	—	11-2137	11-2137	—	11-2137	11-2137	11-2137	11-2137	—	11-2137	11-2137	11-2137	11-2137	11-2137	11-2137
RE21-11-5875	21-614025	3–4	QBT3	11-2137	11-2137	11-2138	—	11-2137	11-2137	—	11-2137	11-2137	11-2137	11-2137	—	11-2137	11-2137	11-2137	11-2137	11-2137	11-2137
RE21-11-5876	21-614026	5–6	QBT3	11-2131	11-2129	—	—	11-2131	11-2131	—	11-2131	11-2131	11-2131	11-2129	—	11-2129	11-2131	—	11-2131	—	11-2129
RE21-11-5877	21-614026	9–10	QBT3	11-2131	11-2129	—	—	11-2131	11-2131	—	11-2131	11-2131	11-2131	11-2129	—	11-2129	11-2131	—	11-2131	—	11-2129
RE21-11-5878	21-614026	14–15	QBT3	11-2131	11-2129	—	—	11-2131	11-2131	—	11-2131	11-2131	11-2131	11-2129	—	11-2129	11-2131	—	11-2131	—	11-2129

*— = Analysis not requested.

Table 7.1-14
Inorganic Chemicals above BVs at Former Building 21-155 and Associated Former Structures Footprints

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Sodium	Thallium	Zinc
Qbt 2, 3, 4 BV[a]				**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**482**	**0.1**	**6.58**	**na[b]**	**na**	**0.3**	**1**	**2770**	**1.1**	**63.5**
Soil BV[a]				**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**915**	**0.73**	**48.8**
Construction Worker SSL[c]				**124**	**65.4**	**4350**	**309**	**na**	**449[d]**	**34.6[e]**	**12400**	**800**	**463**	**92.9[e]**	**6190**	**496000**	**217**	**1550**	**1550**	**na**	**20.4**	**92900**
Industrial SSL[c]				**454**	**17.7**	**224000**	**1120**	**na**	**2920[d]**	**300[f]**	**45400**	**800**	**145000**	**310[f]**	**22700**	**1820000**	**795**	**5680**	**5680**	**na**	**74.9**	**341000**
Residential SSL[c]				**31.3**	**3.9**	**15600**	**77.9**	**na**	**219[d]**	**23[f]**	**3130**	**400**	**10700**	**23[f]**	**1560**	**125000**	**54.8**	**391**	**391**	**na**	**5.16**	**23500**
RE21-11-5778	21-613977	2–3	SOIL	1.13 (U)	—[g]	—	0.565 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE21-11-5777	21-613977	4–5	SOIL	0.97 (U)	—	—	0.485 (U)	—	—	—	—	—	—	0.274	—	1.46	—	—	2.42 (U)	—	—	—
RE21-11-5779	21-613978	2–3	QBT3	1.07 (U)	—	—	—	—	—	—	5.16 (J)	—	—	—	—	1.21	—	1.08 (U)	—	—	—	—
RE21-11-5780	21-613978	4–5	QBT3	1.11 (U)	—	—	—	—	—	—	—	—	—	—	—	1.3	—	1.05 (U)	—	—	—	—
RE21-11-5781	21-613979	5–6	SOIL	1.06 (U)	—	—	0.532 (U)	—	—	—	—	—	—	—	—	3.48	—	—	—	—	—	—
RE21-11-5782	21-613979	7–8	QBT3	1.01 (U)	—	—	—	2330	—	—	—	—	—	—	12.1	1.72	—	1.05 (U)	—	—	—	—
RE21-11-5783	21-613980	6–7	SOIL	1.05 (U)	—	—	0.524 (U)	—	—	—	—	—	—	—	—	2	—	—	2.62 (U)	—	—	58.3
RE21-11-5784	21-613980	8–9	SOIL	1.12 (U)	—	—	0.559 (U)	—	—	—	—	—	—	—	—	4.43	0.000592 (J)	—	—	—	—	—
RE21-11-5785	21-613981	6–7	SOIL	1.1 (U)	—	—	0.549 (U)	—	—	—	—	—	—	—	—	4.51	0.00149 (J)	—	—	—	—	—
RE21-11-5786	21-613981	8–9	QBT3	1.02 (U)	—	—	—	—	—	—	7.4	—	—	—	—	2.34	0.000563 (J)	1.09 (U)	2.54 (U)	—	—	—
RE21-11-5787	21-613982	6–7	SOIL	1.03 (U)	—	—	0.514 (U)	—	20.5	—	—	—	—	—	—	5.03	0.000614 (J)	—	2.57 (U)	—	—	—
RE21-11-5788	21-613982	8–9	SOIL	1.05 (U)	—	—	0.526 (U)	—	—	—	—	—	—	—	—	4.42	—	—	2.63 (U)	—	—	—
RE21-11-5789	21-613983	6–7	QBT3	1.07 (U)	—	—	—	—	7.61	—	6.18	—	—	—	—	6.46	0.00152 (J)	1.09 (UJ)	2.68 (U)	—	2.17 (U)	—
RE21-11-5790	21-613983	8–9	QBT3	1.04 (U)	—	—	—	2880	16	—	33.7	—	—	—	—	1.52	—	1.05 (UJ)	2.59 (U)	—	—	—
RE21-11-5791	21-613984	6–7	QBT3	1.04 (U)	—	83.6	—	4810	8.51	—	11	—	—	—	—	3.05	—	1.05 (U)	—	—	—	—
RE21-11-5792	21-613984	8–9	QBT3	1.02 (U)	—	—	—	—	11.1	—	-	—	—	—	—	1.6	—	0.976 (U)	—	—	—	—
RE21-11-5793	21-613985	6–7	QBT3	1.03 (U)	—	52.2	—	—	16.6	—	20.4	—	—	—	—	2.86	—	1.03 (U)	—	—	—	—
RE21-11-5794	21-613985	8–9	QBT3	0.522 (J)	—	—	—	2230	20.7	—	5.17 (U)	—	—	—	—	2.19	—	1.05 (U)	—	—	—	—
RE21-11-5795	21-613986	6–7	SOIL	—	—	—	0.535 (U)	9640	—	—	17.2	—	—	—	—	4.25	0.000588 (J)	—	—	—	—	49.2
RE21-11-5796	21-613986	8–9	QBT3	1.05 (U)	—	—	—	3770	15.2	—	6.89 (U)	—	695	—	—	1.64	—	1.01 (U)	—	—	—	—
RE21-11-5797	21-613987	6–7	SOIL	1.07 (U)	—	—	0.536 (U)	—	—	9.02	—	—	780	—	—	6.34	—	—	—	—	—	54
RE21-11-5798	21-613987	8–9	QBT3	1.01 (U)	—	—	—	—	9.09	—	6.03	21.7	—	—	—	1.77	—	1.02 (U)	2.52 (U)	—	—	—
RE21-11-5799	21-613988	6–7	SOIL	—	—	—	0.515 (U)	—	—	—	—	—	—	—	—	7	—	—	2.58 (U)	—	—	52.4
RE21-11-5800	21-613988	8–9	QBT3	0.921 (U)	—	—	—	—	—	—	—	—	—	—	—	2.78	—	0.929 (U)	—	—	—	—
RE21-11-5801	21-613989	1–2	SOIL	—	—	—	—	7260 (J+)	—	—	—	—	—	—	—	17.2	0.000774 (J)	—	—	—	—	—
RE21-11-5802	21-613989	3–4	SOIL	—	—	—	0.522 (U)	—	—	—	—	—	—	—	—	3.97	—	—	2.61 (U)	—	—	—
RE21-11-5803	21-613990	1–2	SOIL	1.07 (U)	—	—	0.534 (U)	9300	—	—	—	—	—	—	—	2.23	0.00063 (J)	—	2.67 (U)	—	—	—

Table 7.1-14 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Sodium	Thallium	Zinc
Qbt 2, 3, 4 BV[a]				**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**2770**	**1.1**	**63.5**
Soil BV[a]				**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**915**	**0.73**	**48.8**
Construction Worker SSL[c]				**124**	**65.4**	**4350**	**309**	**na**	**449[d]**	**34.6[e]**	**12400**	**800**	**463**	**92.9[e]**	**6190**	**496000**	**217**	**1550**	**1550**	**na**	**20.4**	**92900**
Industrial SSL[c]				**454**	**17.7**	**224000**	**1120**	**na**	**2920[d]**	**300[f]**	**45400**	**800**	**145000**	**310[f]**	**22700**	**1820000**	**795**	**5680**	**5680**	**na**	**74.9**	**341000**
Residential SSL[c]				**31.3**	**3.9**	**15600**	**77.9**	**na**	**219[d]**	**23[f]**	**3130**	**400**	**10700**	**23[f]**	**1560**	**125000**	**54.8**	**391**	**391**	**na**	**5.16**	**23500**
RE21-11-5804	21-613990	3–4	QBT3	1.07 (U)	—	66.9	—	3170	—	—	—	—	—	—	—	6.5	0.00428	1.13 (U)	—	—	—	—
RE21-11-5805	21-613991	1–2	SOIL	0.956 (U)	—	—	0.478 (U)	17800	—	—	—	57.5	—	—	—	1.62	0.00133 (J)	—	2.39 (U)	—	—	—
RE21-11-5806	21-613991	3–4	SOIL	1.03 (U)	—	—	0.513 (U)	—	—	—	—	—	—	—	—	6.95	—	—	2.57 (U)	—	—	—
RE21-11-5807	21-613992	1–2	SOIL	1.14 (U)	—	—	0.57 (U)	9370	—	—	—	—	—	—	—	8.04	0.000917 (J)	—	2.85 (U)	—	—	136
RE21-11-5808	21-613992	3–4	SOIL	0.958 (U)	—	—	0.479 (U)	6520	—	—	—	—	—	—	—	18.6	—	—	—	—	—	—
RE21-11-5809	21-613993	1–2	SOIL	—	—	—	0.52 (U)	—	—	—	14.8	—	—	—	—	6.2	—	—	—	—	—	—
RE21-11-5810	21-613993	3–4	SOIL	—	—	—	0.559 (U)	—	—	—	—	—	—	—	—	9.21	—	—	—	—	—	—
RE21-11-5811	21-613994	1–2	SOIL	—	—	—	0.555 (U)	—	—	—	—	—	—	—	—	56.2	0.00116 (J)	—	—	—	—	—
RE21-11-5812	21-613994	3–4	SOIL	1.19 (U)	—	—	0.595 (U)	—	—	—	—	—	—	—	—	54.2	0.00107 (J)	—	—	1050	—	—
RE21-11-5813	21-613995	1–2	SOIL	—	—	—	0.496 (U)	—	—	—	—	—	—	—	—	3.44	0.000705 (J)	—	—	—	—	—
RE21-11-5814	21-613995	3–4	SOIL	1.17 (U)	—	—	0.585 (U)	—	—	—	—	—	—	—	26.5	1.77	—	—	—	—	8.69	—
RE21-11-5815	21-613996	5–6	SOIL	—	—	—	0.569 (U)	—	—	—	—	292 (J-)	—	—	—	3.64	—	—	—	—	—	—
RE21-11-5816	21-613996	7–8	QBT3	1.11 (U)	5.33	47.5	—	—	10	—	—	15.1 (J-)	—	—	—	2.21	—	1.09 (U)	—	—	—	—
RE21-11-5817	21-613997	6–7	QBT3	—	—	—	—	3500 (J+)	9.97	—	8.35	78.5 (J-)	—	—	—	7	0.00163 (J)	1.03 (U)	—	—	—	—
RE21-11-5818	21-613997	8–9	QBT3	—	—	—	—	—	—	—	5.76	—	—	—	—	7.36	0.00137 (J)	1.03 (U)	—	—	—	—
RE21-11-5819	21-613998	6–7	SOIL	1.06 (U)	—	—	0.529 (U)	8760	—	—	—	—	—	—	—	5.54	0.00118 (J)	—	2.64 (U)	—	—	—
RE21-11-5820	21-613998	8–9	QBT3	1.06 (U)	—	49.8	—	4590	9.57	—	5.29	—	—	—	—	2.95	—	1.04 (U)	2.64 (U)	—	—	—
RE21-11-5821	21-613999	6–7	SOIL	1.03 (U)	—	—	0.514 (U)	—	—	—	—	—	—	—	—	4.16	—	—	2.57 (U)	—	—	—
RE21-11-5822	21-613999	8–9	QBT3	1.07 (U)	—	—	—	2370	7.58	—	5.43	11.8	—	—	—	2.74	—	1.03 (UJ)	2.67 (U)	—	—	—
RE21-11-5823	21-614000	6–7	SOIL	0.978 (U)	—	—	0.489 (U)	9640	—	—	—	—	—	—	—	3.63	0.0006 (J)	—	—	—	—	—
RE21-11-5824	21-614000	8–9	QBT3	1.04 (U)	—	—	—	—	9.22	—	5.83	—	973	—	—	1.96	—	1.04 (UJ)	—	—	—	—
RE21-11-5825	21-614001	20–21	QBT3	1.02 (U)	—	—	—	—	9.71	—	—	—	—	—	—	1.44	—	1.01 (U)	—	—	—	—
RE21-11-5826	21-614001	30–31	QBT3	1.49 (U)	—	—	—	3210	13.7	—	—	—	—	—	—	2.58	—	0.911 (U)	—	—	—	—
RE21-11-5827	21-614002	5–6	SOIL	—	—	—	0.52 (U)	—	—	—	—	—	—	—	—	9.54	0.00111 (J)	—	—	—	—	—
RE21-11-5828	21-614002	7–8	SOIL	1.03 (U)	—	—	0.513 (U)	—	—	—	—	—	—	—	—	6.02	0.000667 (J)	—	—	—	—	—
RE21-11-5829	21-614003	5–6	SOIL	1.02 (U)	—	—	0.508 (U)	8320 (J-)	—	—	—	—	—	—	—	4.19	0.00236	—	—	—	—	—
RE21-11-5830	21-614003	7–8	QBT3	1.02 (U)	—	—	—	2490 (J-)	—	—	5.39	—	—	—	—	3.58	—	1.03 (U)	—	—	—	—
RE21-11-5831	21-614004	5–6	QBT3	1.06 (U)	—	—	—	—	—	—	—	—	—	—	—	5.61	—	1.12 (U)	—	—	—	—
RE21-11-5832	21-614004	7–8	QBT3	0.964 (U)	—	—	—	—	—	—	—	—	—	—	—	2.24	—	1.03 (U)	—	—	—	—
RE21-11-5833	21-614005	5–6	QBT3	—	—	—	—	—	—	—	7.65	—	—	—	—	4.04	0.000709 (J)	0.99 (U)	—	—	—	—

Table 7.1-14 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Sodium	Thallium	Zinc
Qbt 2, 3, 4 BV[a]				**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**2770**	**1.1**	**63.5**
Soil BV[a]				**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**915**	**0.73**	**48.8**
Construction Worker SSL[c]				**124**	**65.4**	**4350**	**309**	**na**	**449[d]**	**34.6[e]**	**12400**	**800**	**463**	**92.9[e]**	**6190**	**496000**	**217**	**1550**	**1550**	**na**	**20.4**	**92900**
Industrial SSL[c]				**454**	**17.7**	**224000**	**1120**	**na**	**2920[d]**	**300[f]**	**45400**	**800**	**145000**	**310[f]**	**22700**	**1820000**	**795**	**5680**	**5680**	**na**	**74.9**	**341000**
Residential SSL[c]				**31.3**	**3.9**	**15600**	**77.9**	**na**	**219[d]**	**23[f]**	**3130**	**400**	**10700**	**23[f]**	**1560**	**125000**	**54.8**	**391**	**391**	**na**	**5.16**	**23500**
RE21-11-5834	21-614005	7–8	QBT3	—	—	50.3 (J-)	—	—	—	—	7.45	59	699	—	—	2	—	1.1 (U)	—	—	—	—
RE21-11-5835	21-614006	5–6	QBT3	1.05 (U)	—	—	—	—	—	—	—	—	—	—	—	2.16	—	1.04 (UJ)	—	—	—	—
RE21-11-5836	21-614006	7–8	QBT3	1.07 (U)	—	—	—	—	—	—	8.7	24.1	—	—	—	1.95	—	1.09 (UJ)	—	—	—	—
RE21-11-5837	21-614007	5–6	SOIL	—	—	—	0.526 (U)	—	22.7	—	20.3	—	—	—	—	11.7	—	—	—	—	—	—
RE21-11-5838	21-614007	7–8	QBT3	1.11 (U)	—	—	—	—	—	—	5.02	22.3	517	—	—	2.81	—	1.14 (UJ)	—	—	—	—
RE21-11-5839	21-614008	5–6	QBT3	1.02 (U)	—	—	—	—	—	—	7.79	—	NA[h]	—	—	1.78	—	0.953 (U)	—	—	—	—
RE21-11-5840	21-614008	7–8	QBT3	0.928 (U)	—	—	—	—	—	—	—	—	NA	—	—	1.63	—	1.02 (U)	2.32 (U)	—	—	—
RE21-11-5841	21-614009	5–6	QBT3	1.08 (U)	—	—	—	—	—	—	—	—	NA	—	—	1.84	—	1.06 (U)	2.7 (U)	—	2.12 (U)	—
RE21-11-5842	21-614009	7–8	QBT3	1.13 (U)	—	54.1	—	—	8.72	—	6.29 (U)	12.6	NA	—	—	1.67	—	1.09 (U)	2.81 (U)	—	—	—
RE21-11-5843	21-614010	5–6	QBT3	1.11 (U)	—	—	—	—	—	—	—	—	—	—	—	9.09	—	1.05 (UJ)	—	—	—	—
RE21-11-5844	21-614010	7–8	QBT3	1.1 (U)	—	—	—	—	10 (J)	—	—	—	—	—	—	2.93	—	1.06 (UJ)	—	—	—	—
RE21-11-5845	21-614011	5–6	QBT3	1.03 (U)	—	—	—	—	—	—	4.96	—	—	—	—	4.97	—	1.09 (U)	—	—	—	—
RE21-11-5846	21-614011	7–8	QBT3	1.02 (U)	—	—	—	—	—	—	—	—	—	—	—	3.87	—	1 (U)	—	—	—	—
RE21-11-5847	21-614012	5–6	QBT3	1.12 (U)	—	—	—	—	—	—	—	—	—	—	—	6.39	—	1.11 (U)	2.8 (U)	—	—	—
RE21-11-5848	21-614012	7–8	QBT3	1.12 (U)	—	—	—	—	—	—	7.47	29.8	—	—	—	2.5	—	1.08 (U)	—	—	—	—
RE21-11-5849	21-614013	5–6	QBT3	—	—	—	—	—	—	—	5.11 (U)	—	NA	—	—	1.85	—	1.05 (U)	—	—	—	—
RE21-11-5850	21-614013	7–8	QBT3	—	—	—	—	—	—	—	—	—	NA	—	—	1.4	—	1.01 (U)	—	—	—	—
RE21-11-5851	21-614014	5–6	QBT3	1.05 (U)	—	—	—	—	—	—	6.88	—	NA	—	—	3.05	—	1.05 (U)	—	—	—	—
RE21-11-5852	21-614014	7–8	QBT3	1.03 (U)	—	—	—	—	—	—	7.08	—	NA	—	—	3.44	—	0.947 (U)	—	—	—	—
RE21-11-5853	21-614015	12–13	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	1.33	—	1.11 (UJ)	—	—	—	—
RE21-11-5854	21-614015	16–17	QBT3	1.06 (U)	—	—	—	—	44.7	—	10.8	—	—	—	—	1.32	—	1.09 (UJ)	—	—	—	—
RE21-11-5855	21-614015	21–22	QBT3	0.554 (U)	—	—	—	—	23.2	—	19.9	—	—	—	—	1.36	0.000589 (J)	1.05 (UJ)	—	—	—	—
RE21-11-5856	21-614016	1–2	SOIL	1.13 (U)	—	—	0.567 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE21-11-5857	21-614016	3–4	SOIL	1.05 (U)	—	—	0.525 (U)	—	—	—	—	—	—	—	—	1.27	—	—	—	—	—	—
RE21-11-5858	21-614017	1–2	SOIL	1.11 (U)	—	—	0.553 (U)	—	—	—	—	—	—	—	—	1.29	—	—	—	—	—	—
RE21-11-5859	21-614017	3–4	SOIL	0.929 (U)	—	—	0.464 (U)	—	—	—	—	—	—	—	—	1.28	—	—	—	—	—	—
RE21-11-5860	21-614018	1–2	SOIL	0.994 (U)	—	—	0.497 (U)	—	—	—	—	—	—	—	—	8.5	—	—	—	—	—	—
RE21-11-5861	21-614018	3–4	SOIL	1.07 (U)	—	—	0.534 (U)	—	—	—	—	—	—	—	—	29.7	—	—	—	—	—	—
RE21-11-5862	21-614019	1–2	SOIL	1.16 (U)	—	—	0.58 (U)	—	—	—	—	—	—	—	—	2.55	—	—	—	—	—	—
RE21-11-5863	21-614019	3–4	SOIL	1.18 (U)	—	—	0.591 (U)	—	—	—	—	—	—	—	—	10.7	—	—	—	—	—	—

Table 7.1-14 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Sodium	Thallium	Zinc
Qbt 2, 3, 4 BV[a]				**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**2770**	**1.1**	**63.5**
Soil BV[a]				**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**915**	**0.73**	**48.8**
Construction Worker SSL[c]				**124**	**65.4**	**4350**	**309**	**na**	**449[d]**	**34.6[e]**	**12400**	**800**	**463**	**92.9[e]**	**6190**	**496000**	**217**	**1550**	**1550**	**na**	**20.4**	**92900**
Industrial SSL[c]				**454**	**17.7**	**224000**	**1120**	**na**	**2920[d]**	**300[f]**	**45400**	**800**	**145000**	**310[f]**	**22700**	**1820000**	**795**	**5680**	**5680**	**na**	**74.9**	**341000**
Residential SSL[c]				**31.3**	**3.9**	**15600**	**77.9**	**na**	**219[d]**	**23[f]**	**3130**	**400**	**10700**	**23[f]**	**1560**	**125000**	**54.8**	**391**	**391**	**na**	**5.16**	**23500**
RE21-11-5864	21-614020	4–5	QBT3	0.965 (U)	—	—	—	—	—	—	5.08	—	—	—	—	4.03	—	1.01 (U)	—	—	—	—
RE21-11-5865	21-614020	6–7	QBT3	1.07 (U)	—	—	—	—	—	—	—	—	—	—	—	2.38	—	0.989 (U)	—	—	—	—
RE21-11-5866	21-614021	4–5	SOIL	1.47 (U)	—	—	0.516 (U)	13200	—	—	—	—	—	—	—	1.36	—	—	—	—	—	—
RE21-11-5867	21-614021	6–7	SOIL	1.63 (U)	—	—	0.491 (U)	9910	26.7 (J)	—	—	26	—	—	—	1.49	—	—	—	—	—	—
RE21-11-5868	21-614022	4–5	QBT3	0.932 (U)	—	112	—	27000 (J+)	—	—	—	—	—	—	—	2.63	—	0.879 (UJ)	—	—	—	—
RE21-11-5869	21-614022	7–8	QBT3	1.06 (U)	—	—	—	3380 (J+)	—	—	—	—	—	—	—	3.27	—	1.08 (UJ)	—	—	—	—
RE21-11-5870	21-614023	6–7	QBT3	0.583 (J)	—	—	—	4290 (J+)	—	—	10.4 (J)	—	—	—	—	1.94	—	0.931 (UJ)	—	—	—	—
RE21-11-5871	21-614023	8–9	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	1.55	—	1.07 (UJ)	—	—	—	—
RE21-11-5872	21-614024	1–2	SOIL	1.1 (U)	—	—	0.551 (U)	—	—	—	18.4	28.6	—	3.62 (J+)	—	3.81	—	—	—	—	—	—
RE21-11-5873	21-614024	3–4	SOIL	—	—	—	0.545 (U)	—	—	—	—	—	—	—	—	5.68	—	—	—	—	—	—
RE21-11-5874	21-614025	1–2	SOIL	1.1 (U)	—	—	0.548 (U)	—	—	—	—	39.6	—	—	—	4.7	—	—	—	—	—	—
RE21-11-5875	21-614025	3–4	QBT3	1.04 (U)	—	—	—	—	—	—	—	—	—	—	—	4.34	—	1.07 (U)	—	—	—	—
RE21-11-5876	21-614026	5–6	QBT3	1.1 (U)	—	—	—	4610 (J)	—	—	—	—	—	—	—	1.71	—	1.08 (U)	—	—	—	—
RE21-11-5877	21-614026	9–10	QBT3	1.06 (U)	—	—	—	—	—	—	—	—	—	—	—	1.45	—	1.12 (U)	—	—	—	—
RE21-11-5878	21-614026	14–15	QBT3	1.07 (U)	—	—	—	—	—	—	—	—	—	—	—	1.35	—	1.07 (U)	—	—	—	—

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

[a] BVs are from LANL (1998, 059730) unless noted otherwise.

[b] na = Not available.

[c] SSLs are from NMED (2009, 108070) unless otherwise noted.

[d] SSLs are for hexavalent chromium.

[e] Construction Worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2009, 108070).

[f] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[g] — = Not detected or not detected above BV.

[h] NA = Not analyzed.

Table 7.1-15
Organic Chemicals Detected at Former Building 21-155 and Associated Former Structures Footprints

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1248	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene
Construction Worker SSL[a]				**18600**	**263000**	**66800**	**7.58**	**4.36**	**75.8**	**213**	**21.3**	**213**	**6680[b]**	**2060**
Industrial SSL[a]				**36700**	**851000**	**183000**	**8.26**	**8.26**	**8.26**	**23.4**	**2.34**	**23.4**	**18300[b]**	**234**
Residential SSL[a]				**3440**	**67500**	**17200**	**2.22**	**1.12**	**2.22**	**6.21**	**0.621**	**6.21**	**1720[b]**	**62.1**
RE21-11-5778	21-613977	2–3	SOIL	—[c]	—	—	NA[d]	NA	NA	0.0387	0.048	0.046	0.0317 (J)	—
RE21-11-5777	21-613977	4–5	SOIL	—	—	—	NA	NA	NA	0.019 (J)	0.0236 (J)	0.0202 (J)	0.0152 (J)	—
RE21-11-5779	21-613978	2–3	QBT3	—	—	—	NA	NA	NA	0.0345 (J)	0.0375	0.0386	0.0278 (J)	—
RE21-11-5780	21-613978	4–5	QBT3	—	—	—	NA	NA	NA	0.0201 (J)	0.016 (J)	0.0205 (J)	0.0156 (J)	—
RE21-11-5781	21-613979	5–6	SOIL	—	—	—	NA	NA	NA	0.0611 (J)	—	—	—	—
RE21-11-5782	21-613979	7–8	QBT3	—	—	—	NA	NA	NA	0.0232 (J)	0.0228 (J)	0.0205 (J)	0.0126 (J)	—
RE21-11-5783	21-613980	6–7	SOIL	—	—	—	NA	NA	NA	0.0141 (J)	—	0.0168 (J)	—	—
RE21-11-5784	21-613980	8–9	SOIL	—	—	—	NA	NA	NA	—	—	0.0124 (J)	—	—
RE21-11-5785	21-613981	6–7	SOIL	—	—	—	NA	NA	NA	0.0116 (J)	—	0.0176 (J)	—	—
RE21-11-5787	21-613982	6–7	SOIL	—	—	—	NA	NA	NA	—	—	—	—	—
RE21-11-5788	21-613982	8–9	SOIL	—	—	—	NA	NA	NA	0.0114 (J)	—	—	—	—
RE21-11-5791	21-613984	6–7	QBT3	—	—	—	NA	NA	NA	0.013 (J)	—	—	—	—
RE21-11-5795	21-613986	6–7	SOIL	—	—	0.0392	NA	NA	NA	0.134	0.165	0.181	0.0825 (J)	0.0582
RE21-11-5799	21-613988	6–7	SOIL	—	—	—	NA	NA	NA	—	—	—	—	—
RE21-11-5800	21-613988	8–9	QBT3	—	—	—	NA	NA	NA	—	—	—	—	—
RE21-11-5807	21-613992	1–2	SOIL	—	—	—	NA	NA	NA	—	0.0144 (J)	—	0.0121 (J)	—
RE21-11-5813	21-613995	1–2	SOIL	—	0.00321 (J)	—	NA	NA	NA	—	—	—	0.0316 (J)	—
RE21-11-5814	21-613995	3–4	SOIL	—	0.00511 (J)	—	NA	NA	NA	—	—	—	—	—
RE21-11-5815	21-613996	5–6	SOIL	—	—	—	—	0.0034 (J)	—	—	—	—	—	—
RE21-11-5816	21-613996	7–8	QBT3	—	—	—	—	0.0029 (J)	—	—	—	—	—	—
RE21-11-5817	21-613997	6–7	QBT3	—	0.249	—	0.0248	0.0292	—	—	—	—	—	—
RE21-11-5818	21-613997	8–9	QBT3	—	0.00899	—	0.0151	0.0184	0.00386	—	—	—	—	—
RE21-11-5819	21-613998	6–7	SOIL	0.0249 (J)	—	0.111	—	0.0796	—	0.372	0.368	0.437	0.168	—
RE21-11-5820	21-613998	8–9	QBT3	—	—	—	—	0.0861	0.0243	0.0306 (J)	0.0313 (J)	0.0429	0.0162 (J)	—
RE21-11-5821	21-613999	6–7	SOIL	—	—	—	0.0131 (J)	0.0259	—	—	—	—	—	—
RE21-11-5822	21-613999	8–9	QBT3	—	—	—	—	0.0076 (J)	—	—	—	—	—	—
RE21-11-5823	21-614000	6–7	SOIL	—	—	—	0.0614	0.0933	—	0.0288 (J)	—	0.0402	—	—
RE21-11-5824	21-614000	8–9	QBT3	—	—	—	—	0.0125 (J)	—	0.0265 (J)	—	—	—	—
RE21-11-5825	21-614001	20–21	QBT3	—	—	—	0.01	0.0116	0.0032 (J)	—	—	—	—	—
RE21-11-5826	21-614001	30–31	QBT3	—	—	—	0.0046	0.0067	—	—	—	—	—	—

Table 7.1-15 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1248	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene
Construction Worker SSL[a]				**18600**	**263000**	**66800**	**7.58**	**4.36**	**75.8**	**213**	**21.3**	**213**	**6680[b]**	**2060**
Industrial SSL[a]				**36700**	**851000**	**183000**	**8.26**	**8.26**	**8.26**	**23.4**	**2.34**	**23.4**	**18300[b]**	**234**
Residential SSL[a]				**3440**	**67500**	**17200**	**2.22**	**1.12**	**2.22**	**6.21**	**0.621**	**6.21**	**1720[b]**	**62.1**
RE21-11-5827	21-614002	5–6	SOIL	—	—	0.0109 (J)	NA	NA	NA	0.0513	0.0611	0.0543	0.0349 (J)	0.0202 (J)
RE21-11-5828	21-614002	7–8	SOIL	—	—	—	NA	NA	NA	0.0164 (J)	—	—	—	—
RE21-11-5830	21-614003	7–8	QBT3	—	—	—	NA	NA	NA	0.0157 (J)	—	—	—	—
RE21-11-5835	21-614006	5–6	QBT3	—	—	—	NA	NA	NA	—	—	—	—	—
RE21-11-5837	21-614007	5–6	SOIL	—	—	—	NA	NA	NA	0.0136 (J)	—	—	—	—
RE21-11-5843	21-614010	5–6	QBT3	—	0.00529 (J)	—	NA	NA	NA	—	—	—	—	—
RE21-11-5844	21-614010	7–8	QBT3	—	0.00644	—	NA	NA	NA	—	—	—	—	—
RE21-11-5845	21-614011	5–6	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-5846	21-614011	7–8	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-5847	21-614012	5–6	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-5848	21-614012	7–8	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-5849	21-614013	5–6	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-5850	21-614013	7–8	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-5851	21-614014	5–6	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-5852	21-614014	7–8	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-5853	21-614015	12–13	QBT3	—	—	—	—	—	0.00133 (J)	—	—	—	—	—
RE21-11-5854	21-614015	16–17	QBT3	—	—	—	—	—	—	—	—	—	—	—
RE21-11-5855	21-614015	21–22	QBT3	—	—	—	—	—	0.00208 (J)	—	—	—	—	—
RE21-11-5857	21-614016	3–4	SOIL	—	0.04	—	NA	NA	NA	—	—	—	—	—
RE21-11-5858	21-614017	1–2	SOIL	—	0.00208 (J)	—	NA	NA	NA	—	—	—	—	—
RE21-11-5859	21-614017	3–4	SOIL	—	0.00212 (J)	—	NA	NA	NA	—	—	—	—	—
RE21-11-5860	21-614018	1–2	SOIL	—	0.00216 (J)	—	NA	NA	NA	—	—	—	—	—
RE21-11-5861	21-614018	3–4	SOIL	—	0.00198 (J)	—	NA	NA	NA	—	—	—	—	—
RE21-11-5864	21-614020	4–5	QBT3	—	—	—	NA	NA	NA	0.0302 (J)	0.0388	0.0274 (J)	—	—
RE21-11-5866	21-614021	4–5	SOIL	—	—	0.0137 (J)	NA	NA	NA	0.0654	0.0675	0.0894	0.032 (J)	0.0287 (J)
RE21-11-5867	21-614021	6–7	SOIL	—	—	—	NA	NA	NA	0.0135 (J)	—	0.012 (J)	—	—
RE21-11-5868	21-614022	4–5	QBT3	—	—	—	NA	NA	NA	0.0348	0.0446	0.0466	0.0306 (J)	0.0223 (J)
RE21-11-5869	21-614022	7–8	QBT3	—	—	—	NA	NA	NA	—	—	—	—	—
RE21-11-5872	21-614024	1–2	SOIL	0.05	—	0.175	NA	NA	NA	0.556	0.49	0.649	0.238	0.259
RE21-11-5873	21-614024	3–4	SOIL	—	—	—	NA	NA	NA	—	—	—	—	—
RE21-11-5875	21-614025	3–4	QBT3	—	—	—	NA	NA	NA	—	—	—	—	—

Table 7.1-15 (continued)

Sample ID	Location ID	Depth (ft)	Media	Bis(2-ethylhexyl)phthalate	Butanone[2-]	Chrysene	Dibenz(a,h)anthracene	Diethylphthalate	Fluoranthene	Fluorene	Heptachlorodibenzodioxin [1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran [1,2,3,4,6,7,8-]
Construction Worker SSL[a]				**4760**	**148000**	**20600**	**21.3**	**191000**	**8910**	**8910**	**na**[e]	**na**	**na**
Industrial SSL[a]				**1370**	**369000**	**2340**	**2.34**	**547000**	**24400**	**24400**	**na**	**na**	**na**
Residential SSL[a]				**347**	**39600**	**621**	**0.621**	**48900**	**2290**	**2290**	**na**	**na**	**na**
RE21-11-5778	21-613977	2–3	SOIL	—	—	0.0445	0.0151 (J)	—	0.0688	—	N	NA	NA
RE21-11-5777	21-613977	4–5	SOIL	—	—	0.0175 (J)	—	—	0.0304 (J)	—	NA	NA	NA
RE21-11-5779	21-613978	2–3	QBT3	—	—	0.036 (J)	0.0116 (J)	—	0.0551	—	NA	NA	NA
RE21-11-5780	21-613978	4–5	QBT3	—	—	0.016 (J)	—	—	0.0285 (J)	—	NA	NA	NA
RE21-11-5781	21-613979	5–6	SOIL	—	—	—	—	—	0.0897 (J)	—	NA	NA	NA
RE21-11-5782	21-613979	7–8	QBT3	—	—	0.0183 (J)	—	—	0.0426	—	NA	NA	NA
RE21-11-5783	21-613980	6–7	SOIL	—	—	0.0129 (J)	—	—	0.0175 (J)	—	NA	NA	NA
RE21-11-5784	21-613980	8–9	SOIL	—	—	—	—	—	0.0128 (J)	—	NA	NA	NA
RE21-11-5785	21-613981	6–7	SOIL	—	—	—	—	—	0.0146 (J)	—	NA	NA	NA
RE21-11-5787	21-613982	6–7	SOIL	—	—	—	—	—	0.0258 (J)	—	NA	NA	NA
RE21-11-5788	21-613982	8–9	SOIL	—	—	—	—	—	0.0222 (J)	—	NA	NA	NA
RE21-11-5791	21-613984	6–7	QBT3	—	—	—	—	—	0.0169 (J)	—	NA	NA	NA
RE21-11-5795	21-613986	6–7	SOIL	—	—	0.154	—	—	0.31	—	NA	NA	NA
RE21-11-5799	21-613988	6–7	SOIL	—	—	—	—	—	0.0176 (J)	—	NA	NA	NA
RE21-11-5800	21-613988	8–9	QBT3	—	—	—	—	—	—	—	NA	NA	NA
RE21-11-5807	21-613992	1–2	SOIL	—	—	—	0.0172 (J)	—	—	—	NA	NA	NA
RE21-11-5813	21-613995	1–2	SOIL	—	—	—	—	—	0.0156 (J)	—	NA	NA	NA
RE21-11-5814	21-613995	3–4	SOIL	—	—	—	—	—	—	—	NA	NA	NA
RE21-11-5815	21-613996	5–6	SOIL	—	—	—	—	—	—	—	0.00000528	0.00000863	0.000000581 (J)
RE21-11-5816	21-613996	7–8	QBT3	—	—	—	—	—	—	—	0.00000297 (J)	0.00000485 (J)	—
RE21-11-5817	21-613997	6–7	QBT3	—	—	—	—	0.0961 (J)	—	—	0.0000848	0.000168	0.00000631
RE21-11-5818	21-613997	8–9	QBT3	—	—	—	—	—	—	—	0.0000429	0.0000839	0.00000341 (J)
RE21-11-5819	21-613998	6–7	SOIL	—	—	0.429	—	—	0.679	0.026 (J)	0.00000606	0.0000132	0.00000255 (J)
RE21-11-5820	21-613998	8–9	QBT3	—	—	0.0264 (J)	—	—	0.0373	—	0.00000446 (J)	0.0000089	0.00000161 (J)
RE21-11-5821	21-613999	6–7	SOIL	—	—	—	—	—	—	—	0.00000421 (J)	0.00000881	0.00000109 (J)
RE21-11-5822	21-613999	8–9	QBT3	—	—	—	—	—	—	—	0.0000065	0.000012	0.000000974 (J)
RE21-11-5823	21-614000	6–7	SOIL	—	—	0.0303 (J)	—	—	0.0523	—	0.000533	0.000884	0.0000125
RE21-11-5824	21-614000	8–9	QBT3	—	—	0.0248 (J)	—	—	0.0561	—	0.0000314	0.0000499	0.00000134 (J)
RE21-11-5825	21-614001	20–21	QBT3	—	—	—	—	—	—	—	0.000000672 (J)	0.00000139 (J)	—
RE21-11-5826	21-614001	30–31	QBT3	—	—	—	—	—	—	—	0.00000139 (J)	0.00000289 (J)	0.000000545 (J)
RE21-11-5827	21-614002	5–6	SOIL	—	—	0.0469	—	—	0.123	—	NA	NA	NA

Table 7.1-15 (continued)

Sample ID	Location ID	Depth (ft)	Media	Bis(2-ethylhexyl)phthalate	Butanone[2-]	Chrysene	Dibenz(a,h)anthracene	Diethylphthalate	Fluoranthene	Fluorene	Heptachlorodibenzodioxin [1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran [1,2,3,4,6,7,8-]
Construction Worker SSL[a]				**4760**	**148000**	**20600**	**21.3**	**191000**	**8910**	**8910**	**na[e]**	**na**	**na**
Industrial SSL[a]				**1370**	**369000**	**2340**	**2.34**	**547000**	**24400**	**24400**	**na**	**na**	**na**
Residential SSL[a]				**347**	**39600**	**621**	**0.621**	**48900**	**2290**	**2290**	**na**	**na**	**na**
RE21-11-5828	21-614002	7–8	SOIL	—	—	0.0146 (J)	—	—	0.0269 (J)	—	NA	NA	NA
RE21-11-5830	21-614003	7–8	QBT3	—	—	0.0117 (J)	—	—	0.0215 (J)	—	NA	NA	NA
RE21-11-5835	21-614006	5–6	QBT3	—	—	—	—	—	0.0143 (J)	—	NA	NA	NA
RE21-11-5837	21-614007	5–6	SOIL	0.112 (J)	—	—	—	—	0.0181 (J)	—	NA	NA	NA
RE21-11-5843	21-614010	5–6	QBT3	—	—	—	—	—	—	—	NA	NA	NA
RE21-11-5844	21-614010	7–8	QBT3	—	—	—	—	—	—	—	NA	NA	NA
RE21-11-5845	21-614011	5–6	QBT3	—	—	—	—	—	—	—	0.000000577 (J)	0.000000577 (J)	—
RE21-11-5846	21-614011	7–8	QBT3	—	—	—	—	—	—	—	—	—	—
RE21-11-5847	21-614012	5–6	QBT3	—	—	—	—	—	—	—	0.000000534 (J)	0.000000534 (J)	—
RE21-11-5848	21-614012	7–8	QBT3	—	—	—	—	—	—	—	0.000000815 (J)	0.00000181 (J)	—
RE21-11-5849	21-614013	5–6	QBT3	—	—	—	—	—	—	—	0.00000233 (J)	0.00000438 (J)	0.000000521 (J)
RE21-11-5850	21-614013	7–8	QBT3	—	—	—	—	0.0825 (J)	—	—	0.00000374 (J)	0.00000463 (J)	0.00000622
RE21-11-5851	21-614014	5–6	QBT3	—	—	—	—	—	—	—	0.00000249 (J)	0.00000525	0.000000798 (J)
RE21-11-5852	21-614014	7–8	QBT3	—	—	—	—	—	—	—	0.00000665	0.00000802	0.00000612
RE21-11-5853	21-614015	12–13	QBT3	—	—	—	—	—	—	—	—	—	—
RE21-11-5854	21-614015	16–17	QBT3	—	—	—	—	—	—	—	—	0.000000761 (J)	—
RE21-11-5855	21-614015	21–22	QBT3	—	—	—	—	—	—	—	—	0.000000732 (J)	—
RE21-11-5857	21-614016	3–4	SOIL	—	0.00762	—	—	—	—	—	NA	NA	NA
RE21-11-5858	21-614017	1–2	SOIL	—	—	—	—	—	—	—	NA	NA	NA
RE21-11-5859	21-614017	3–4	SOIL	—	—	—	—	—	—	—	NA	NA	NA
RE21-11-5860	21-614018	1–2	SOIL	—	—	—	—	—	—	—	NA	NA	NA
RE21-11-5861	21-614018	3–4	SOIL	—	—	—	—	—	—	—	NA	NA	NA
RE21-11-5864	21-614020	4–5	QBT3	—	—	0.0235 (J)	—	—	0.0598	—	NA	NA	NA
RE21-11-5866	21-614021	4–5	SOIL	—	—	0.0582	0.0172 (J)	—	0.0823	—	NA	NA	NA
RE21-11-5867	21-614021	6–7	SOIL	—	—	—	—	—	0.0157 (J)	—	NA	NA	NA
RE21-11-5868	21-614022	4–5	QBT3	—	—	0.0306 (J)	—	—	0.0352	—	NA	NA	NA
RE21-11-5869	21-614022	7–8	QBT3	—	—	—	—	0.0846 (J)	—	—	NA	NA	NA
RE21-11-5872	21-614024	1–2	SOIL	0.175 (J)	—	0.604	0.104	—	1.49	0.056	NA	NA	NA
RE21-11-5873	21-614024	3–4	SOIL	0.269 (J)	—	—	—	—	—	—	NA	NA	NA
RE21-11-5875	21-614025	3–4	QBT3	0.292 (J)	—	—	—	—	—	—	NA	NA	NA

Table 7.1-15 (continued)

Sample ID	Location ID	Depth (ft)	Media	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-]	Hexachlorodibenzofuran [1,2,3,6,7,8-]	Hexachlorodibenzofuran [1,2,3,7,8,9-]	Hexachlorodibenzofuran [2,3,4,6,7,8-]
Construction Worker SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE21-11-5778	21-613977	2–3	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5777	21-613977	4–5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5779	21-613978	2–3	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5780	21-613978	4–5	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5781	21-613979	5–6	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5782	21-613979	7–8	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5783	21-613980	6–7	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5784	21-613980	8–9	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5785	21-613981	6–7	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5787	21-613982	6–7	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5788	21-613982	8–9	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5791	21-613984	6–7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5795	21-613986	6–7	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5799	21-613988	6–7	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5800	21-613988	8–9	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5807	21-613992	1–2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5813	21-613995	1–2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5814	21-613995	3–4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5815	21-613996	5–6	SOIL	—[c]	0.00000221 (J)	—	—	—	—	—	—	—	—
RE21-11-5816	21-613996	7–8	QBT3	—	0.000000911 (J)	—	—	—	—	—	—	—	—
RE21-11-5817	21-613997	6–7	QBT3	0.000000493 (J)	0.0000195	0.00000109 (J)	0.00000311 (J)	0.00000147 (J)	0.0000214	—	—	—	0.000000755 (J)
RE21-11-5818	21-613997	8–9	QBT3	—	0.00000887	0.000000537 (J)	0.00000169 (J)	0.00000107 (J)	0.0000134	—	—	—	—
RE21-11-5819	21-613998	6–7	SOIL	—	0.00000605	—	—	—	0.00000132 (J)	—	—	—	—
RE21-11-5820	21-613998	8–9	QBT3	0.000000857 (J)	0.00000493	—	0.00000138 (J)	0.000000594 (J)	0.00000807	0.00000199 (J)	—	—	0.00000113 (J)
RE21-11-5821	21-613999	6–7	SOIL	—	0.00000252 (J)	—	—	—	0.00000071 (J)	—	—	—	—
RE21-11-5822	21-613999	8–9	QBT3	—	0.00000225 (J)	—	—	—	0.000000825 (J)	0.000000646 (J)	—	—	—
RE21-11-5823	21-614000	6–7	SOIL	0.00000129 (J)	0.0000398	0.0000016 (J)	0.0000101	0.00000479 (J)	0.0000767	0.00000204 (J)	0.00000121 (J)	0.000000573 (J)	0.0000017 (J)
RE21-11-5824	21-614000	8–9	QBT3	—	0.00000305 (J)	0.000000806 (J)	0.00000311 (J)	0.00000272 (J)	0.0000176	0.00000333 (J)	0.00000087 (J)	—	0.000000653 (J)
RE21-11-5825	21-614001	20–21	QBT3	—	—	—	—	—	—	—	—	—	—
RE21-11-5826	21-614001	30–31	QBT3	—	0.00000133 (J)	—	—	—	—	—	—	—	—
RE21-11-5827	21-614002	5–6	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 7.1-15 (continued)

Sample ID	Location ID	Depth (ft)	Media	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-]	Hexachlorodibenzofuran [1,2,3,6,7,8-]	Hexachlorodibenzofuran [1,2,3,7,8,9-]	Hexachlorodibenzofuran [2,3,4,6,7,8-]
Construction Worker SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE21-11-5828	21-614002	7–8	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5830	21-614003	7–8	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5835	21-614006	5–6	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5837	21-614007	5–6	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5843	21-614010	5–6	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5844	21-614010	7–8	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5845	21-614011	5–6	QBT3	—	—	—	—	—	—	—	—	—	—
RE21-11-5846	21-614011	7–8	QBT3	—	—	—	—	—	—	—	—	—	—
RE21-11-5847	21-614012	5–6	QBT3	—	—	—	—	—	—	—	—	—	—
RE21-11-5848	21-614012	7–8	QBT3	—	—	—	—	—	—	—	—	—	—
RE21-11-5849	21-614013	5–6	QBT3	0.000000646 (J)	0.00000213 (J)	—	0.000000574 (J)	0.000000535 (J)	0.00000516	0.00000198 (J)	0.000000717 (J)	0.000000531 (J)	0.000000644 (J)
RE21-11-5850	21-614013	7–8	QBT3	0.00000107 (J)	0.00000824	0.000000757 (J)	0.00000252 (J)	0.0000017 (J)	0.00000809	0.0000506	0.00000746	0.00000161 (J)	0.00000186 (J)
RE21-11-5851	21-614014	5–6	QBT3	0.000000535 (J)	0.00000271 (J)	—	—	—	0.00000214 (J)	0.000000999 (J)	—	—	—
RE21-11-5852	21-614014	7–8	QBT3	0.000000819 (J)	0.00000794	0.00000164 (J)	0.00000265 (J)	0.00000176 (J)	0.00000887	0.0000323	0.00000569	0.000000801 (J)	0.00000155 (J)
RE21-11-5853	21-614015	12–13	QBT3	—	—	—	—	—	—	—	—	—	—
RE21-11-5854	21-614015	16–17	QBT3	—	—	—	—	—	—	—	—	—	—
RE21-11-5855	21-614015	21–22	QBT3	—	—	—	—	—	—	—	—	—	—
RE21-11-5857	21-614016	3–4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5858	21-614017	1–2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5859	21-614017	3–4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5860	21-614018	1–2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5861	21-614018	3–4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5864	21-614020	4–5	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5866	21-614021	4–5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5867	21-614021	6–7	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5868	21-614022	4–5	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5869	21-614022	7–8	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5872	21-614024	1–2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5873	21-614024	3–4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-11-5875	21-614025	3–4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 7.1-15 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Methyl-2-pentanone[4-]	Methylene Chloride	Methylnaphthalene[2-]	Nitrotoluene[2-]	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)
Construction Worker SSL[a]				**na**	**213**	**23100**	**10600**	**1240[f]**	**279**	**na**	**na**	**na**	**na**
Industrial SSL[a]				**na**	**23.4**	**73300**	**1090**	**4100[g]**	**145**	**na**	**na**	**na**	**na**
Residential SSL[a]				**na**	**6.21**	**5950**	**199**	**310[g]**	**29.1**	**na**	**na**	**na**	**na**
RE21-11-5778	21-613977	2–3	SOIL	NA	0.0259 (J)	—	—	—	NA	NA	NA	NA	NA
RE21-11-5777	21-613977	4–5	SOIL	NA	0.0122 (J)	—	—	—	NA	NA	NA	NA	NA
RE21-11-5779	21-613978	2–3	QBT3	NA	0.021 (J)	—	—	—	NA	NA	NA	NA	NA
RE21-11-5780	21-613978	4–5	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA
RE21-11-5781	21-613979	5–6	SOIL	NA	—	—	—	—	NA	NA	NA	NA	NA
RE21-11-5782	21-613979	7–8	QBT3	NA	0.0114 (J)	—	—	—	NA	NA	NA	NA	NA
RE21-11-5783	21-613980	6–7	SOIL	NA	—	—	—	—	NA	NA	NA	NA	NA
RE21-11-5784	21-613980	8–9	SOIL	NA	—	0.00207 (J)	—	—	NA	NA	NA	NA	NA
RE21-11-5785	21-613981	6–7	SOIL	NA	—	0.00153 (J)	—	—	NA	NA	NA	NA	NA
RE21-11-5787	21-613982	6–7	SOIL	NA	—	—	—	—	NA	NA	NA	NA	NA
RE21-11-5788	21-613982	8–9	SOIL	NA	—	—	—	—	NA	NA	NA	NA	NA
RE21-11-5791	21-613984	6–7	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA
RE21-11-5795	21-613986	6–7	SOIL	NA	0.0821 (J)	—	—	—	NA	NA	NA	NA	NA
RE21-11-5799	21-613988	6–7	SOIL	NA	—	—	—	—	NA	NA	NA	NA	NA
RE21-11-5800	21-613988	8–9	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA
RE21-11-5807	21-613992	1–2	SOIL	NA	0.0141 (J)	—	—	—	NA	NA	NA	NA	NA
RE21-11-5813	21-613995	1–2	SOIL	NA	—	—	—	—	NA	NA	NA	NA	NA
RE21-11-5814	21-613995	3–4	SOIL	NA	—	—	0.00313 (J)	—	NA	NA	NA	NA	NA
RE21-11-5815	21-613996	5–6	SOIL	—	—	—	—	—	0.253 (J)	0.0000509	0.00000148 (J)	—	—
RE21-11-5816	21-613996	7–8	QBT3	—	—	—	—	—	—	0.0000272	—	—	—
RE21-11-5817	21-613997	6–7	QBT3	0.000013	—	—	—	—	—	0.000556	0.00000925 (J)	—	0.00000475
RE21-11-5818	21-613997	8–9	QBT3	0.00000585	—	—	—	—	—	0.000278	0.00000442 (J)	—	0.00000154 (J)
RE21-11-5819	21-613998	6–7	SOIL	0.0000039 (J)	0.156	—	—	—	—	0.0000645	0.00000332 (J)	—	—
RE21-11-5820	21-613998	8–9	QBT3	0.0000069	0.0155 (J)	—	—	—	—	0.0000416	0.00000155 (J)	—	0.00000198 (J)
RE21-11-5821	21-613999	6–7	SOIL	0.000000827 (J)	—	—	—	—	—	0.0000419	0.00000128 (J)	—	—
RE21-11-5822	21-613999	8–9	QBT3	0.00000222 (J)	—	—	—	—	—	0.0000555	—	—	—
RE21-11-5823	21-614000	6–7	SOIL	0.0000338	—	—	—	—	—	0.00342	0.0000158	—	0.000000526 (J)
RE21-11-5824	21-614000	8–9	QBT3	0.0000091	—	—	—	—	—	0.000137	0.00000104 (J)	0.00000113 (J)	0.00000831
RE21-11-5825	21-614001	20–21	QBT3	—	—	—	—	—	—	0.00000587 (J)	—	—	—
RE21-11-5826	21-614001	30–31	QBT3	0.00000109 (J)	—	—	—	—	—	0.0000146	0.000000962 (J)	—	—
RE21-11-5827	21-614002	5–6	SOIL	NA	0.0304 (J)	—	—	—	NA	NA	NA	NA	NA

Table 7.1-15 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Methyl-2-pentanone[4-]	Methylene Chloride	Methylnaphthalene[2-]	Nitrotoluene[2-]	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)
Construction Worker SSL[a]				**na**	**213**	**23100**	**10600**	**1240[f]**	**279**	**na**	**na**	**na**	**na**
Industrial SSL[a]				**na**	**23.4**	**73300**	**1090**	**4100[g]**	**145**	**na**	**na**	**na**	**na**
Residential SSL[a]				**na**	**6.21**	**5950**	**199**	**310[g]**	**29.1**	**na**	**na**	**na**	**na**
RE21-11-5828	21-614002	7–8	SOIL	NA	—	—	—	—	NA	NA	NA	NA	NA
RE21-11-5830	21-614003	7–8	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA
RE21-11-5835	21-614006	5–6	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA
RE21-11-5837	21-614007	5–6	SOIL	NA	—	0.0023 (J)	—	—	NA	NA	NA	NA	NA
RE21-11-5843	21-614010	5–6	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA
RE21-11-5844	21-614010	7–8	QBT3	NA	—	—	0.00312 (J)	—	NA	NA	NA	NA	NA
RE21-11-5845	21-614011	5–6	QBT3	—	—	—	—	—	—	0.00000445 (J)	—	—	—
RE21-11-5846	21-614011	7–8	QBT3	—	—	—	—	—	—	0.00000394 (J)	—	—	—
RE21-11-5847	21-614012	5–6	QBT3	—	—	—	—	—	—	—	—	—	—
RE21-11-5848	21-614012	7–8	QBT3	—	—	—	—	—	—	0.00000437 (J)	—	—	—
RE21-11-5849	21-614013	5–6	QBT3	0.00000554	—	—	—	—	—	0.00000369 (J)	—	—	0.0000014 (J)
RE21-11-5850	21-614013	7–8	QBT3	0.0000765	—	—	—	—	—	0.00000319 (J)	—	0.0000013 (J)	0.00000235 (J)
RE21-11-5851	21-614014	5–6	QBT3	0.00000168 (J)	—	—	—	—	—	0.00000236 (J)	—	—	—
RE21-11-5852	21-614014	7–8	QBT3	0.0000556	—	—	—	—	—	0.00000289 (J)	—	—	—
RE21-11-5853	21-614015	12–13	QBT3	—	—	—	—	—	—	0.00000165 (J)	—	—	—
RE21-11-5854	21-614015	16–17	QBT3	—	—	—	—	—	—	0.00000269 (J)	—	0.000000584 (J)	0.000000584 (J)
RE21-11-5855	21-614015	21–22	QBT3	—	—	—	—	—	—	0.00000396 (J)	—	0.000000565 (J)	0.000000565 (J)
RE21-11-5857	21-614016	3–4	SOIL	NA	—	—	0.00305 (J)	—	NA	NA	NA	NA	NA
RE21-11-5858	21-614017	1–2	SOIL	NA	—	—	—	—	NA	NA	NA	NA	NA
RE21-11-5859	21-614017	3–4	SOIL	NA	—	—	—	—	NA	NA	NA	NA	NA
RE21-11-5860	21-614018	1–2	SOIL	NA	—	—	—	—	NA	NA	NA	NA	NA
RE21-11-5861	21-614018	3–4	SOIL	NA	—	—	0.00284 (J)	—	NA	NA	NA	NA	NA
RE21-11-5864	21-614020	4–5	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA
RE21-11-5866	21-614021	4–5	SOIL	NA	0.0291 (J)	—	—	—	NA	NA	NA	NA	NA
RE21-11-5867	21-614021	6–7	SOIL	NA	—	—	—	—	NA	NA	NA	NA	NA
RE21-11-5868	21-614022	4–5	QBT3	NA	0.0258 (J)	—	—	—	NA	NA	NA	NA	NA
RE21-11-5869	21-614022	7–8	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA
RE21-11-5872	21-614024	1–2	SOIL	NA	0.252 (J)	—	—	0.00741 (J)	NA	NA	NA	NA	NA
RE21-11-5873	21-614024	3–4	SOIL	NA	—	—	—	—	NA	NA	NA	NA	NA
RE21-11-5875	21-614025	3–4	QBT3	NA	—	—	—	—	NA	NA	NA	NA	NA

Table 7.1-15 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	Xylene[1,3-]+Xylene[1,4-]
Construction Worker SSL[a]				**na**	**na**	**na**	**7150**	**6680**	**na**	**0.0127**	**na**	**21100**	**3130[h]**
Industrial SSL[a]				**na**	**na**	**na**	**20500**	**18300**	**na**	**0.00147**	**na**	**57900**	**3610[h]**
Residential SSL[a]				**na**	**na**	**na**	**1830**	**1720**	**na**	**0.000374**	**na**	**5570**	**1090[h]**
RE21-11-5778	21-613977	2–3	SOIL	NA	NA	NA	0.0348 (J)	0.0596	NA	NA	NA	—	—
RE21-11-5777	21-613977	4–5	SOIL	NA	NA	NA	0.0118 (J)	0.0259 (J)	NA	NA	NA	—	—
RE21-11-5779	21-613978	2–3	QBT3	NA	NA	NA	0.0203 (J)	0.0461	NA	NA	NA	—	—
RE21-11-5780	21-613978	4–5	QBT3	NA	NA	NA	0.0114 (J)	0.0243 (J)	NA	NA	NA	—	—
RE21-11-5781	21-613979	5–6	SOIL	NA	NA	NA	—	0.0821 (J)	NA	NA	NA	—	—
RE21-11-5782	21-613979	7–8	QBT3	NA	NA	NA	0.0179 (J)	0.0358 (J)	NA	NA	NA	—	—
RE21-11-5783	21-613980	6–7	SOIL	NA	NA	NA	—	0.016 (J)	NA	NA	NA	—	—
RE21-11-5784	21-613980	8–9	SOIL	NA	NA	NA	—	0.0135 (J)	NA	NA	NA	0.00053 (J)	—
RE21-11-5785	21-613981	6–7	SOIL	NA	NA	NA	—	0.0143 (J)	NA	NA	NA	—	—
RE21-11-5787	21-613982	6–7	SOIL	NA	NA	NA	0.0124 (J)	0.0174 (J)	NA	NA	NA	—	—
RE21-11-5788	21-613982	8–9	SOIL	NA	NA	NA	—	0.0164 (J)	NA	NA	NA	—	—
RE21-11-5791	21-613984	6–7	QBT3	NA	NA	NA	—	0.0177 (J)	NA	NA	NA	—	—
RE21-11-5795	21-613986	6–7	SOIL	NA	NA	NA	0.185	0.271	NA	NA	NA	—	0.000449 (J)
RE21-11-5799	21-613988	6–7	SOIL	NA	NA	NA	0.0157 (J)	0.0161 (J)	NA	NA	NA	—	—
RE21-11-5800	21-613988	8–9	QBT3	NA	NA	NA	0.014 (J)	—	NA	NA	NA	—	—
RE21-11-5807	21-613992	1–2	SOIL	NA	NA	NA	—	—	NA	NA	NA	—	—
RE21-11-5813	21-613995	1–2	SOIL	NA	NA	NA	0.0148 (J)	—	NA	NA	NA	—	—
RE21-11-5814	21-613995	3–4	SOIL	NA	NA	NA	—	—	NA	NA	NA	—	—
RE21-11-5815	21-613996	5–6	SOIL	—	—	—	—	—	—	—	0.000000834 (J)	—	—
RE21-11-5816	21-613996	7–8	QBT3	—	—	—	—	—	—	—	—	—	—
RE21-11-5817	21-613997	6–7	QBT3	0.000000709 (J)	0.00000137 (J)	0.0000142	—	—	0.0000004 (J)	0.00000207 (J)	0.0000185	—	—
RE21-11-5818	21-613997	8–9	QBT3	—	0.000000709 (J)	0.00000647	—	—	0.000000243 (J)	—	0.00000468 (J)	—	—
RE21-11-5819	21-613998	6–7	SOIL	—	—	0.00000629	0.503	0.887	—	—	0.00000313 (J)	—	—
RE21-11-5820	21-613998	8–9	QBT3	0.00000108 (J)	0.000000704 (J)	0.00000518	0.0144 (J)	0.0369	0.000000193 (J)	—	0.00000442 (J)	—	—
RE21-11-5821	21-613999	6–7	SOIL	—	—	0.00000203 (J)	—	—	—	—	—	—	—
RE21-11-5822	21-613999	8–9	QBT3	0.000000525 (J)	—	0.00000223 (J)	—	—	—	—	0.0000011 (J)	—	—
RE21-11-5823	21-614000	6–7	SOIL	0.000000738 (J)	0.00000216 (J)	0.0000349	0.0267 (J)	0.0495	—	0.00000129 (J)	0.0000173	—	—

Table 7.1-15 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	Xylene[1,3-]+Xylene[1,4-]
Construction Worker SSL[a]				**na**	**na**	**na**	**7150**	**6680**	**na**	**0.0127**	**na**	**21100**	**3130**[h]
Industrial SSL[a]				**na**	**na**	**na**	**20500**	**18300**	**na**	**0.00147**	**na**	**57900**	**3610**[h]
Residential SSL[a]				**na**	**na**	**na**	**1830**	**1720**	**na**	**0.000374**	**na**	**5570**	**1090**[h]
RE21-11-5824	21-614000	8–9	QBT3	0.00000516	0.00000192 (J)	0.0000213	0.0275 (J)	0.0377	—	0.00000168 (J)	0.00000601 (J)	—	—
RE21-11-5825	21-614001	20–21	QBT3	—	—	—	—	—	—	—	—	—	—
RE21-11-5826	21-614001	30–31	QBT3	—	—	0.00000146 (J)	—	—	—	—	—	—	—
RE21-11-5827	21-614002	5–6	SOIL	NA	NA	NA	0.0405	0.0922	NA	NA	NA	0.000734 (J)	—
RE21-11-5828	21-614002	7–8	SOIL	NA	NA	NA	—	0.0273 (J)	NA	NA	NA	0.0008 (J)	0.000394 (J)
RE21-11-5830	21-614003	7–8	QBT3	NA	NA	NA	0.0113 (J)	0.0226 (J)	NA	NA	NA	—	—
RE21-11-5835	21-614006	5–6	QBT3	NA	NA	NA	—	—	NA	NA	NA	—	—
RE21-11-5837	21-614007	5–6	SOIL	NA	NA	NA	—	0.0181 (J)	NA	NA	NA	0.000803 (J)	0.00052 (J)
RE21-11-5843	21-614010	5–6	QBT3	NA	NA	NA	—	—	NA	NA	NA	—	—
RE21-11-5844	21-614010	7–8	QBT3	NA	NA	NA	—	—	NA	NA	NA	—	—
RE21-11-5845	21-614011	5–6	QBT3	—	—	—	—	—	—	—	0.000000999 (J)	—	—
RE21-11-5846	21-614011	7–8	QBT3	—	—	—	—	—	—	—	0.00000101 (J)	—	—
RE21-11-5847	21-614012	5–6	QBT3	—	—	—	—	—	—	—	—	—	—
RE21-11-5848	21-614012	7–8	QBT3	—	—	—	—	—	—	—	0.00000122 (J)	—	—
RE21-11-5849	21-614013	5–6	QBT3	0.00000933	0.00000182 (J)	0.0000187	—	—	—	0.00000524 (J)	0.0000173	—	—
RE21-11-5850	21-614013	7–8	QBT3	0.0000534	0.00000504	0.000104	—	—	—	0.00000451 (J)	0.0000142 (J)	—	—
RE21-11-5851	21-614014	5–6	QBT3	0.0000008 (J)	—	0.00000165 (J)	—	—	—	0.00000689 (J)	0.0000121 (J)	—	—
RE21-11-5852	21-614014	7–8	QBT3	0.00000814	0.00000194 (J)	0.0000189	—	—	—	0.0000266	0.0000575	—	—
RE21-11-5853	21-614015	12–13	QBT3	—	—	—	—	—	—	—	—	—	—
RE21-11-5854	21-614015	16–17	QBT3	—	—	—	—	—	—	—	—	—	—
RE21-11-5855	21-614015	21–22	QBT3	—	—	—	—	—	—	—	—	—	—
RE21-11-5857	21-614016	3–4	SOIL	NA	NA	NA	—	—	NA	NA	NA	—	—
RE21-11-5858	21-614017	1–2	SOIL	NA	NA	NA	—	—	NA	NA	NA	—	—
RE21-11-5859	21-614017	3–4	SOIL	NA	NA	NA	—	—	NA	NA	NA	—	—
RE21-11-5860	21-614018	1–2	SOIL	NA	NA	NA	—	—	NA	NA	NA	—	—
RE21-11-5861	21-614018	3–4	SOIL	NA	NA	NA	—	—	NA	NA	NA	—	—
RE21-11-5864	21-614020	4–5	QBT3	NA	NA	NA	0.031 (J)	0.042	NA	NA	NA	—	—

Table 7.1-15 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	Xylene[1,3-]+Xylene[1,4-]
Construction Worker SSL[a]				**na**	**na**	**na**	**7150**	**6680**	**na**	**0.0127**	**na**	**21100**	**3130[h]**
Industrial SSL[a]				**na**	**na**	**na**	**20500**	**18300**	**na**	**0.00147**	**na**	**57900**	**3610[h]**
Residential SSL[a]				**na**	**na**	**na**	**1830**	**1720**	**na**	**0.000374**	**na**	**5570**	**1090[h]**
RE21-11-5866	21-614021	4–5	SOIL	NA	NA	NA	0.0575	0.127	NA	NA	NA	—	—
RE21-11-5867	21-614021	6–7	SOIL	NA	NA	NA	—	0.0153 (J)	NA	NA	NA	—	—
RE21-11-5868	21-614022	4–5	QBT3	NA	NA	NA	0.0202 (J)	0.0581	NA	NA	NA	—	—
RE21-11-5869	21-614022	7–8	QBT3	NA	NA	NA	—	—	NA	NA	NA	—	—
RE21-11-5872	21-614024	1–2	SOIL	NA	NA	NA	0.754	1.19	NA	NA	NA	—	—
RE21-11-5873	21-614024	3–4	SOIL	NA	NA	NA	—	—	NA	NA	NA	—	—
RE21-11-5875	21-614025	3–4	QBT3	NA	NA	NA	—	—	NA	NA	NA	—	—

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

[a] SSLs are from NMED (2009, 108070) unless otherwise noted.

[b] Pyrene SSL used as surrogate based on structural similarity.

[c] — = Not detected.

[d] NA = Not analyzed.

[e] na = Not available.

[f] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2009, 108070).

[g] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[h] Xylenes SSL used as surrogate based on structural similarity.

Table 7.1-16
Radionuclides Detected or Detected above BVs/FVs
at Former Building 21-155 and Associated Former Structures Footprints

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236
Qbt 2, 3, 4 BV/FV[a]				**na[b]**	**na**	**na**	**na**	**1.98**	**0.09**
Soil BV/FV[a]				**1.65**	**0.023**	**0.054**	**na**	**2.59**	**0.2**
Construction Worker SAL[c]				**18**	**40**	**36**	**320000**	**220**	**43**
Industrial SAL[c]				**23**	**240**	**210**	**440000**	**1500**	**87**
Residential SAL[c]				**5.6**	**37**	**33**	**750**	**170**	**17**
RE21-11-5778	21-613977	2–3	SOIL	—[d]	—	—	0.543721	—	—
RE21-11-5777	21-613977	4–5	SOIL	—	—	—	2.88571	—	—
RE21-11-5779	21-613978	2–3	QBT3	—	—	—	0.576396	—	—
RE21-11-5780	21-613978	4–5	QBT3	—	—	—	0.496488	—	—
RE21-11-5781	21-613979	5–6	SOIL	—	—	0.0889	6.59083	—	—
RE21-11-5782	21-613979	7–8	QBT3	—	—	—	2.63288	—	—
RE21-11-5783	21-613980	6–7	SOIL	—	—	0.0317	2.26942	—	—
RE21-11-5784	21-613980	8–9	SOIL	—	—	—	20.9729	—	—
RE21-11-5785	21-613981	6–7	SOIL	—	0.045	0.0649	15.3333	21.7	0.994
RE21-11-5786	21-613981	8–9	QBT3	—	—	—	5.76969	2.62	0.154
RE21-11-5787	21-613982	6–7	SOIL	—	—	—	15.8127	—	—
RE21-11-5788	21-613982	8–9	SOIL	—	—	0.0316	20.6997	—	—
RE21-11-5789	21-613983	6–7	QBT3	—	—	—	22.8792	—	—
RE21-11-5790	21-613983	8–9	QBT3	—	—	—	4.2113	—	—
RE21-11-5791	21-613984	6–7	QBT3	—[d]	—	—	50.4152	—	—
RE21-11-5792	21-613984	8–9	QBT3	—	—	—	8.32721	—	—
RE21-11-5793	21-613985	6–7	QBT3	—	—	—	13.4644	—	—
RE21-11-5794	21-613985	8–9	QBT3	—	—	—	8.48268	—	—
RE21-11-5795	21-613986	6–7	SOIL	—	—	—	149.551	—	—
RE21-11-5796	21-613986	8–9	QBT3	—	—	—	55.4235	—	—
RE21-11-5797	21-613987	6–7	SOIL	—	—	—	79.5254	—	—
RE21-11-5798	21-613987	8–9	QBT3	—	—	—	71.7783	—	—
RE21-11-5799	21-613988	6–7	SOIL	—	—	—	21.3153	—	—
RE21-11-5800	21-613988	8–9	QBT3	—	—	—	28.192	—	—
RE21-11-5801	21-613989	1–2	SOIL	—	—	—	5.8	—	—
RE21-11-5802	21-613989	3–4	SOIL	—	—	—	5.9215	—	—
RE21-11-5803	21-613990	1–2	SOIL	—	—	—	11.7955	—	—

Table 7.1-16 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236
Qbt 2, 3, 4 BV/FV[a]				**na[b]**	**na**	**na**	**na**	**1.98**	**0.09**
Soil BV/FV[a]				**1.65**	**0.023**	**0.054**	**na**	**2.59**	**0.2**
Construction Worker SAL[c]				**18**	**40**	**36**	**320000**	**220**	**43**
Industrial SAL[c]				**23**	**240**	**210**	**440000**	**1500**	**87**
Residential SAL[c]				**5.6**	**37**	**33**	**750**	**170**	**17**
RE21-11-5804	21-613990	3–4	QBT3	—	—	—	31.8604	—	—
RE21-11-5805	21-613991	1–2	SOIL	—	—	—	0.569636	—	—
RE21-11-5806	21-613991	3–4	SOIL	—	—	—	2.89976	—	—
RE21-11-5807	21-613992	1–2	SOIL	—	—	—	0.453044	—	—
RE21-11-5808	21-613992	3–4	SOIL	—	—	—	0.53526	—	—
RE21-11-5809	21-613993	1–2	SOIL	—	—	0.0686	0.294973	—	—
RE21-11-5810	21-613993	3–4	SOIL	—	—	—	0.478605	—	—
RE21-11-5811	21-613994	1–2	SOIL	—	—	—	1.43588	—	—
RE21-11-5812	21-613994	3–4	SOIL	—	—	—	2.02983	—	—
RE21-11-5813	21-613995	1–2	SOIL	—	—	0.131	0.349836	—	—
RE21-11-5814	21-613995	3–4	SOIL	—	—	—	0.337952	—	—
RE21-11-5815	21-613996	5–6	SOIL	—	—	—	2.05951	—	—
RE21-11-5816	21-613996	7–8	QBT3	—	—	—	0.686058	—	—
RE21-11-5817	21-613997	6–7	QBT3	—	—	—	17.9894	—	—
RE21-11-5818	21-613997	8–9	QBT3	—	—	—	24.5503	—	—
RE21-11-5819	21-613998	6–7	SOIL	—	—	0.149	21.7373	—	—
RE21-11-5820	21-613998	8–9	QBT3	—	—	—	22.398	—	—
RE21-11-5821	21-613999	6–7	SOIL	—	—	—	18.5887	—	—
RE21-11-5822	21-613999	8–9	QBT3	—	—	0.0197	31.0169	—	—
RE21-11-5823	21-614000	6–7	SOIL	—	—	0.104	74.4392	6.45	0.291
RE21-11-5824	21-614000	8–9	QBT3	—	—	—	16.7987	—	—
RE21-11-5825	21-614001	20–21	QBT3	—	—	—	3.30517	—	—
RE21-11-5826	21-614001	30–31	QBT3	—	—	—	3.89795	—	—
RE21-11-5827	21-614002	5–6	SOIL	—	—	—	2.66343	—	—
RE21-11-5828	21-614002	7–8	SOIL	—	—	0.0471	2.47207	—	—
RE21-11-5829	21-614003	5–6	SOIL	—	—	0.0441 (J)	0.968839	—	—
RE21-11-5830	21-614003	7–8	QBT3	—	—	0.0573 (J)	1.5323	—	—
RE21-11-5831	21-614004	5–6	QBT3	—	—	NA	2.76796	2	—
RE21-11-5832	21-614004	7–8	QBT3	—	—	—	0.950697	4.41	0.187

Table 7.1-16 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236
Qbt 2, 3, 4 BV/FV[a]				**na[b]**	**na**	**na**	**na**	**1.98**	**0.09**
Soil BV/FV[a]				**1.65**	**0.023**	**0.054**	**na**	**2.59**	**0.2**
Construction Worker SAL[c]				**18**	**40**	**36**	**320000**	**220**	**43**
Industrial SAL[c]				**23**	**240**	**210**	**440000**	**1500**	**87**
Residential SAL[c]				**5.6**	**37**	**33**	**750**	**170**	**17**
RE21-11-5833	21-614005	5–6	QBT3	—	0.0209	0.0381 (J)	1.98129	—	0.114
RE21-11-5834	21-614005	7–8	QBT3	—	—	NA	1.14355	—	0.154
RE21-11-5835	21-614006	5–6	QBT3	—	—	—	1.76722	10	0.379
RE21-11-5836	21-614006	7–8	QBT3	—	—	—	1.1627	8.22	0.539
RE21-11-5837	21-614007	5–6	SOIL	—	—	—	3.58235	—	—
RE21-11-5838	21-614007	7–8	QBT3	—	—	—	2.1	3.99	0.24
RE21-11-5839	21-614008	5–6	QBT3	—	—	—	1.89196	4.25	0.236
RE21-11-5840	21-614008	7–8	QBT3	—	—	—	1.41402	12.6	0.638
RE21-11-5841	21-614009	5–6	QBT3	—	—	—	1.89477	—	0.138
RE2 1-11-5842	21-614009	7–8	QBT3	—	—	—	1.87272	—	—
RE21-11-5843	21-614010	5–6	QBT3	—	—	—	3.49091	—	0.109
RE21-11-5844	21-614010	7–8	QBT3	—	—	—	1.40705	3.48	0.196
RE21-11-5845	21-614011	5–6	QBT3	—	—	NA	1.70625	—	—
RE21-11-5846	21-614011	7–8	QBT3	—	—	NA	1.37275	—	—
RE21-11-5847	21-614012	5–6	QBT3	—	—	NA	5.38333	4.33	0.326
RE21-11-5848	21-614012	7–8	QBT3	—	—	NA	2.78884	5.66	0.354
RE21-11-5849	21-614013	5–6	QBT3	—	—	—	2.34145	—	—
RE21-11-5850	21-614013	7–8	QBT3	—	—	—	1.42119	—	—
RE21-11-5851	21-614014	5–6	QBT3	—	—	—	2.21723	5.78	0.26
RE21-11-5852	21-614014	7–8	QBT3	—	—	—	1.34634	3.23	0.198
RE21-11-5853	21-614015	12–13	QBT3	—	0.0192	3.22	0.246655	—	—
RE21-11-5854	21-614015	16–17	QBT3	—	—	—	0.219581	—	—
RE21-11-5855	21-614015	21–22	QBT3	—	—	—	0.20979	—	—
RE21-11-5856	21-614016	1–2	SOIL	—	—	—	0.413488	—	—
RE21-11-5857	21-614016	3–4	SOIL	—	—	—	0.458902	—	—
RE21-11-5858	21-614017	1–2	SOIL	—	—	—	0.17852	—	—
RE21-11-5859	21-614017	3–4	SOIL	—	—	—	0.323335	—	—
RE21-11-5860	21-614018	1–2	SOIL	0.11	—	0.262	1.12978	—	—
RE21-11-5861	21-614018	3–4	SOIL	—	—	—	1.5527	—	—

Table 7.1-16 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236
Qbt 2, 3, 4 BV/FV[a]				**na[b]**	**na**	**na**	**na**	**1.98**	**0.09**
Soil BV/FV[a]				**1.65**	**0.023**	**0.054**	**na**	**2.59**	**0.2**
Construction Worker SAL[c]				**18**	**40**	**36**	**320000**	**220**	**43**
Industrial SAL[c]				**23**	**240**	**210**	**440000**	**1500**	**87**
Residential SAL[c]				**5.6**	**37**	**33**	**750**	**170**	**17**
RE21-11-5862	21-614019	1–2	SOIL	—	—	—	4.23256	—	—
RE21-11-5863	21-614019	3–4	SOIL	—	—	0.0838	6.86036	—	—
RE21-11-5864	21-614020	4–5	QBT3	—	—	—	8.12012	—	—
RE21-11-5865	21-614020	6–7	QBT3	—	—	—	10.8435	—	—
RE21-11-5866	21-614021	4–5	SOIL	—	—	0.0238	0.697659	—	—
RE21-11-5867	21-614021	6–7	SOIL	—	—	—	0.788267	—	—
RE21-11-5868	21-614022	4–5	QBT3	—	—	—	0.989371	—	—
RE21-11-5869	21-614022	7–8	QBT3	—	—	—	3.11748	—	—
RE21-11-5870	21-614023	6–7	QBT3	—	—	—	0.470244	—	—
RE21-11-5871	21-614023	8–9	QBT3	—	—	—	0.586169	—	—
RE21-11-5872	21-614024	1–2	SOIL	—	—	0.323	1.16841	—	—
RE21-11-5873	21-614024	3–4	SOIL	—	—	0.12	19.3134	—	—
RE21-11-5874	21-614025	1–2	SOIL	—	—	0.0483	0.40248	—	—
RE21-11-5875	21-614025	3–4	QBT3	—	—	—	0.335802	—	—
RE21-11-5876	21-614026	5–6	QBT3	—	—	—	6.73107	—	—
RE21-11-5877	21-614026	9–10	QBT3	—	—	—	12.3225	—	—
RE21-11-5878	21-614026	14–15	QBT3	—	—	—	10.3691	—	—

Note: Results are in pCi/g.

[a] BVs/FVs are from LANL (1998, 059730).

[b] na = Not available.

[c] SALs are from LANL (2009, 107655).

[d] — = Not detected or not detected above BV/FV.

Table 7.1-17
Samples Collected and Analyses Requested at Former Building 21-209 and Associated Former Structure 21-466 Footprints

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Asbestos	Dioxins/Furans	Gamma-Emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
MD21-10-21206	21-612262	10–11	SOIL	10-3971	10-3970	10-3967	10-3968	10-3971	10-3971	10-3969	10-3971	10-3971	10-3971	10-3970	10-3969	10-3970	10-3971	10-3969	—[a]	10-3969	10-3970
MD21-10-21207	21-612262	11–12	QBT3	10-3971	10-3970	10-3967	10-3968	10-3971	10-3971	10-3969	10-3971	10-3971	10-3971	10-3970	10-3969	10-3970	10-3971	10-3969	—	10-3969	10-3970
MD21-10-21208	21-612263	10–11	SOIL	10-3971	10-3970	10-3967	10-3968	10-3971	10-3971	10-3969	10-3971	10-3971	10-3971	10-3970	10-3969	10-3970	10-3971	10-3969	—	10-3969	10-3970
MD21-10-21209	21-612263	11–12	QBT3	10-3971	10-3970	10-3967	10-3968	10-3971	10-3971	10-3969	10-3971	10-3971	10-3971	10-3970	10-3969	10-3970	10-3971	10-3969	—	10-3969	10-3970
MD21-10-21210	21-612264	10–11	SOIL	10-3971	10-3970	10-3967	10-3968	10-3971	10-3971	10-3969	10-3971	10-3971	10-3971	10-3970	10-3969	10-3970	10-3971	10-3969	—	10-3969	10-3970
MD21-10-21211	21-612264	11–12	QBT3	10-3971	10-3970	10-3967	10-3968	10-3971	10-3971	10-3969	10-3971	10-3971	10-3971	10-3970	10-3969	10-3970	10-3971	10-3969	—	10-3969	10-3970
MD21-10-21212	21-612265	10–11	SOIL	10-3971	10-3970	10-3967	—	10-3971	10-3971	—	10-3971	10-3971	10-3971	10-3970	—	10-3970	10-3971	10-3969	—	10-3969	10-3970
MD21-10-21213	21-612265	11–12	QBT3	10-3971	10-3970	10-3967	—	10-3971	10-3971	—	10-3971	10-3971	10-3971	10-3970	—	10-3970	10-3971	10-3969	—	10-3969	10-3970
MD21-10-21214	21-612266	10–11	SOIL	10-3971	10-3970	10-3967	—	10-3971	10-3971	—	10-3971	10-3971	10-3971	10-3970	—	10-3970	10-3971	10-3969	—	10-3969	10-3970
MD21-10-21215	21-612266	11–12	QBT3	10-3971	10-3970	10-3967	—	10-3971	10-3971	—	10-3971	10-3971	10-3971	10-3970	—	10-3970	10-3971	10-3969	—	10-3969	10-3970
MD21-10-21218	21-612268	10–11	SOIL	—	10-3970	10-3967	—	—	—	—	—	—	—	10-3970	—	10-3970	—	10-3969	—	10-3969	10-3970
MD21-10-21204	21-613173	10–11	SOIL	10-3971	10-3970	10-3967	10-3968	10-3971	10-3971	10-3969	10-3971	10-3971	10-3971	10-3970	10-3969	10-3970	10-3971	10-3969	—	10-3969	10-3970
MD21-10-21205	21-613173	11–12	QBT3	10-3971	10-3970	10-3967	10-3968	10-3971	10-3971	10-3969	10-3971	10-3971	10-3971	10-3970	10-3969	10-3970	10-3971	10-3969	—	10-3969	10-3970
MD21-10-27096	21-613173	12.3–13	QBT3	—	—	—	—	—	—	—	—	—	—	11-81[b]	—	—	—	—	—	—	—
MD21-10-21216	21-613174	10–11	SOIL	10-3971	10-3970	10-3967	—	10-3971	10-3971	—	10-3971	10-3971	10-3971	10-3970	—	10-3970	10-3971	10-3969	—	10-3969	10-3970
MD21-10-21217	21-613174	11–12	QBT3	10-3971	10-3970	10-3967	—	10-3971	10-3971	—	10-3971	10-3971	10-3971	10-3970	—	10-3970	10-3971	10-3969	—	10-3969	10-3970
MD21-10-27097	21-613174	12.3–13	QBT3	—	—	—	—	—	—	—	—	—	—	11-81[b]	—	—	—	—	—	—	—
MD21-10-21220	21-613175	10–11	SOIL	10-3971	10-3970	10-3967	—	10-3971	10-3971	—	10-3971	10-3971	10-3971	10-3970	—	10-3970	10-3971	10-3969	—	10-3969	10-3970
MD21-10-21221	21-613175	11–12	QBT3	10-3971	10-3970	10-3967	—	10-3971	10-3971	—	10-3971	10-3971	10-3971	10-3970	—	10-3970	10-3971	10-3969	—	10-3969	10-3970
MD21-10-27098	21-613175	12.3–13	QBT3	—	—	—	—	—	—	—	—	—	—	11-81[b]	—	—	—	—	—	—	—
RE21-11-10194	21-614361	1–2	SOIL	11-2384	11-2382	11-2383	—	11-2384	11-2384	—	11-2384	11-2384	11-2384	11-2382	—	11-2382	11-2384	11-2381	11-2384	11-2381	11-2382
RE21-11-10195	21-614361	3–4	QBT3	11-2384	11-2382	11-2383	—	11-2384	11-2384	—	11-2384	11-2384	11-2384	11-2382	—	11-2382	11-2384	11-2381	11-2384	11-2381	11-2382
RE21-11-10196	21-614362	1–2	SOIL	11-2384	11-2382	11-2383	—	11-2384	11-2384	—	11-2384	11-2384	11-2384	11-2382	—	11-2382	11-2384	11-2381	11-2384	11-2381	11-2382
RE21-11-10197	21-614362	3–4	QBT3	11-2384	11-2382	11-2383	—	11-2384	11-2384	—	11-2384	11-2384	11-2384	11-2382	—	11-2382	11-2384	11-2381	11-2384	11-2381	11-2382
RE21-11-10198	21-614363	1–2	QBT3	11-2384	11-2382	11-2383	—	11-2384	11-2384	—	11-2384	11-2384	11-2384	11-2382	—	11-2382	11-2384	11-2381	11-2384	11-2381	11-2382
RE21-11-10199	21-614363	3–4	QBT3	11-2384	11-2382	11-2383	—	11-2384	11-2384	—	11-2384	11-2384	11-2384	11-2382	—	11-2382	11-2384	11-2381	11-2384	11-2381	11-2382
RE21-11-10200	21-614364	1–2	QBT3	11-2384	11-2382	11-2383	—	11-2384	11-2384	—	11-2384	11-2384	11-2384	11-2382	—	11-2382	11-2384	11-2381	11-2384	11-2381	11-2382
RE21-11-10201	21-614364	3–4	QBT3	11-2384	11-2382	11-2383	—	11-2384	11-2384	—	11-2384	11-2384	11-2384	11-2382	—	11-2382	11-2384	11-2381	11-2384	11-2381	11-2382
RE21-11-10202	21-614365	1–2	SOIL	11-2384	11-2382	11-2383	—	11-2384	11-2384	—	11-2384	11-2384	11-2384	11-2382	—	11-2382	11-2384	11-2381	11-2384	11-2381	11-2382
RE21-11-10203	21-614365	3–4	QBT3	11-2384	11-2382	11-2383	—	11-2384	11-2384	—	11-2384	11-2384	11-2384	11-2382	—	11-2382	11-2384	11-2381	11-2384	11-2381	11-2382
RE21-11-10204	21-614366	1–2	SOIL	11-2401	11-2398	11-2399	—	11-2401	11-2401	—	11-2401	11-2401	11-2401	11-2398	—	11-2398	11-2401	11-2397	11-2401	11-2397	11-2398

Table 7.1-17 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Asbestos	Dioxins/Furans	Gamma-Emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE21-11-10205	21-614366	3–4	QBT3	11-2401	11-2398	11-2399	—	11-2401	11-2401	—	11-2401	11-2401	11-2401	11-2398	—	11-2398	11-2401	11-2397	11-2401	11-2397	11-2398
RE21-11-10206	21-614367	1–2	QBT3	11-2401	11-2398	11-2399	—	11-2401	11-2401	—	11-2401	11-2401	11-2401	11-2398	—	11-2398	11-2401	11-2397	11-2401	11-2397	11-2398
RE21-11-10207	21-614367	3–4	QBT3	11-2401	11-2398	11-2399	—	11-2401	11-2401	—	11-2401	11-2401	11-2401	11-2398	—	11-2398	11-2401	11-2397	11-2401	11-2397	11-2398
RE21-11-10208	21-614368	1–2	SOIL	11-2401	11-2398	11-2399	—	11-2401	11-2401	—	11-2401	11-2401	11-2401	11-2398	—	11-2398	11-2401	11-2397	11-2401	11-2397	11-2398
RE21-11-10209	21-614368	3–4	QBT3	11-2401	11-2398	11-2399	—	11-2401	11-2401	—	11-2401	11-2401	11-2401	11-2398	—	11-2398	11-2401	11-2397	11-2401	11-2397	11-2398
RE21-11-10210	21-614369	1–2	SOIL	11-2401	11-2398	11-2399	—	11-2401	11-2401	—	11-2401	11-2401	11-2401	11-2398	—	11-2398	11-2401	11-2397	11-2401	11-2397	11-2398
RE21-11-10211	21-614369	3–4	QBT3	11-2401	11-2398	11-2399	—	11-2401	11-2401	—	11-2401	11-2401	11-2401	11-2398	—	11-2398	11-2401	11-2397	11-2401	11-2397	11-2398
RE21-11-10212	21-614370	3–4	SOIL	11-2441	11-2441	11-2442	—	11-2441	11-2441	—	11-2441	11-2441	11-2441	11-2441	—	11-2441	11-2441	11-2441	11-2441	11-2441	11-2441
RE21-11-10213	21-614370	5–6	SOIL	11-2441	11-2441	11-2442	—	11-2441	11-2441	—	11-2441	11-2441	11-2441	11-2441	—	11-2441	11-2441	11-2441	11-2441	11-2441	11-2441
RE21-11-10214	21-614371	1–2	QBT3	11-2401	11-2398	11-2399	11-2400	11-2401	11-2401	11-2397	11-2401	11-2401	11-2401	11-2398	11-2397	11-2398	11-2401	11-2397	11-2401	11-2397	11-2398
RE21-11-10215	21-614371	3–4	QBT3	11-2401	11-2398	11-2399	11-2400	11-2401	11-2401	11-2397	11-2401	11-2401	11-2401	11-2398	11-2397	11-2398	11-2401	11-2397	11-2401	11-2397	11-2398
RE21-11-10216	21-614372	5–6	SOIL	11-2417	11-2416	—	—	11-2417	11-2417	—	11-2417	11-2417	11-2417	11-2416	—	11-2416	11-2417	—	11-2417	—	11-2416
RE21-11-10217	21-614372	9–10	QBT3	11-2417	11-2416	—	—	11-2417	11-2417	—	11-2417	11-2417	11-2417	11-2416	—	11-2416	11-2417	—	11-2417	—	11-2416
RE21-11-10218	21-614372	14–15	QBT3	11-2417	11-2416	—	—	11-2417	11-2417	—	11-2417	11-2417	11-2417	11-2416	—	11-2416	11-2417	—	11-2417	—	11-2416

[a] — = Analysis not requested.

[b] Analyzed for chromium only.

Table 7.1-18
Inorganic Chemicals above BVs at Former Building 21-209 and Associated Former Structure 21-466 Footprints

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**
Construction Worker SSL[b]				**40700**	**124**	**65.4**	**4350**	**309**	**na**[c]	**449**[d]	**34.6**[e]	**12400**	**800**
Industrial SSL[b]				**1130000**	**454**	**17.7**	**224000**	**1120**	**na**	**2920**[d]	**300**[f]	**45400**	**800**
Residential SSL[b]				**78100**	**31.3**	**3.9**	**15600**	**77.9**	**na**	**219**[d]	**23**[f]	**3130**	**400**
MD21-10-21206	21-612262	10–11	SOIL	—[g]	1.05 (U)	—	—	0.525 (U)	—	—	14.8	—	—
MD21-10-21207	21-612262	11–12	QBT3	—	1.05 (U)	—	—	—	—	—	7.83	—	—
MD21-10-21208	21-612263	10–11	SOIL	—	0.97 (U)	—	—	0.485 (U)	—	—	43	—	—
MD21-10-21209	21-612263	11–12	QBT3	—	1.03 (U)	—	—	—	—	—	5.21	—	—
MD21-10-21210	21-612264	10–11	SOIL	—	1 (U)	—	—	0.501 (U)	—	—	41.1	—	25.5
MD21-10-21211	21-612264	11–12	QBT3	—	1.01 (U)	—	—	—	—	—	17.3	—	—
MD21-10-21212	21-612265	10–11	SOIL	—	1.12 (U)	—	—	0.56 (U)	—	—	12.7	—	—
MD21-10-21213	21-612265	11–12	QBT3	—	0.948 (U)	—	55.8 (J)	—	2790 (J)	—	20.7	—	—
MD21-10-21214	21-612266	10–11	SOIL	—	1.04 (U)	—	—	0.522 (U)	—	—	25.7	28.5	—
MD21-10-21215	21-612266	11–12	QBT3	—	1.01 (U)	—	—	—	3140 (J)	—	10.8	4.68	—
MD21-10-21218	21-612268	10–11	SOIL	—	1.07 (U)	—	—	—	7740 (J)	—	83.1	—	—
MD21-10-21204	21-613173	10–11	SOIL	—	1.07 (U)	—	—	0.533 (U)	8900 (J)	—	51.5	—	38.5
MD21-10-21205	21-613173	11–12	QBT3	—	1.04 (U)	—	—	—	11100 (J)	16	13.4	—	16
MD21-10-21216	21-613174	10–11	SOIL	—	0.98 (U)	—	—	0.49 (U)	—	—	25.5	—	—
MD21-10-21217	21-613174	11–12	QBT3	—	1 (U)	—	—	—	—	25.5	3.69	—	—
MD21-10-21220	21-613175	10–11	SOIL	—	1.02 (U)	—	—	0.509 (U)	—	—	19.9	—	—
MD21-10-21221	21-613175	11–12	QBT3	—	1.01 (U)	—	—	—	—	15.1	6.11	—	—
RE21-11-10194	21-614361	1–2	SOIL	—	0.942 (U)	—	—	0.54 (U)	—	—	—	—	—
RE21-11-10195	21-614361	3–4	QBT3	—	1.39 (U)	3.37	75.5	—	25700 (J)	8.32 (J)	—	9.48 (J)	14
RE21-11-10196	21-614362	1–2	SOIL	—	1.28 (U)	—	—	0.491 (U)	—	—	—	—	—
RE21-11-10197	21-614362	3–4	QBT3	—	0.915 (U)	—	61.8	—	2230 (J)	—	—	5.37 (J)	—
RE21-11-10198	21-614363	1–2	QBT3	—	0.708 (U)	—	—	—	—	—	—	—	—
RE21-11-10199	21-614363	3–4	QBT3	—	1.03 (U)	—	—	—	—	—	—	—	—
RE21-11-10200	21-614364	1–2	QBT3	—	0.912 (U)	—	48.7	—	—	—	—	4.89 (J)	—
RE21-11-10201	21-614364	3–4	QBT3	—	0.56 (U)	—	—	—	—	—	—	—	—
RE21-11-10202	21-614365	1–2	SOIL	—	1.26 (U)	—	—	—	—	—	—	19.5 (J)	—
RE21-11-10203	21-614365	3–4	QBT3	—	0.501 (U)	—	—	—	—	—	—	—	—

Table 7.1-18 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**
Construction Worker SSL[b]				**40700**	**124**	**65.4**	**4350**	**309**	**na**[c]	**449**[d]	**34.6**[e]	**12400**	**800**
Industrial SSL[b]				**1130000**	**454**	**17.7**	**224000**	**1120**	**na**	**2920**[d]	**300**[f]	**45400**	**800**
Residential SSL[b]				**78100**	**31.3**	**3.9**	**15600**	**77.9**	**na**	**219**[d]	**23**[f]	**3130**	**400**
RE21-11-10204	21-614366	1–2	SOIL	—	1.14 (U)	—	—	—	—	—	—	—	—
RE21-11-10205	21-614366	3–4	QBT3	—	0.993 (U)	—	79.2	—	6310	—	3.47	5.73	16.6
RE21-11-10206	21-614367	1–2	QBT3	—	0.723 (U)	—	—	—	—	—	—	—	—
RE21-11-10207	21-614367	3–4	QBT3	—	1.04 (U)	—	—	—	—	—	—	—	—
RE21-11-10208	21-614368	1–2	SOIL	—	—	—	—	0.539 (U)	—	—	—	—	—
RE21-11-10209	21-614368	3–4	QBT3	—	0.786 (U)	—	190	—	5490	—	—	—	—
RE21-11-10210	21-614369	1–2	SOIL	—	1.91 (U)	—	—	0.507 (U)	—	—	—	—	—
RE21-11-10211	21-614369	3–4	QBT3	9100	0.825 (U)	—	87.1	—	2530	—	—	4.86	—
RE21-11-10212	21-614370	3–4	SOIL	—	1.03 (UJ)	—	—	0.514 (U)	—	—	—	—	—
RE21-11-10213	21-614370	5–6	SOIL	—	1.1 (UJ)	—	—	0.549 (U)	—	—	—	—	—
RE21-11-10214	21-614371	1–2	QBT3	—	—	—	61.8	—	—	—	—	—	—
RE21-11-10215	21-614371	3–4	QBT3	—	0.589 (U)	—	—	—	—	—	—	—	—
RE21-11-10216	21-614372	5–6	SOIL	—	1.15 (U)	—	—	0.553 (U)	—	—	—	—	—
RE21-11-10217	21-614372	9–10	QBT3	—	1.27 (U)	—	—	—	4750	8.9	—	6.29	—
RE21-11-10218	21-614372	14–15	QBT3	—	0.963 (U)	—	—	—	—	18.1	—	6.97	—

Table 7.1-18 (continued)

Sample ID	Location ID	Depth (ft)	Media	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Zinc
Qbt 2, 3, 4 BV[a]				**1690**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**63.5**
Soil BV[a]				**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**48.8**
Construction Worker SSL[b]				**na**	**463**	**92.9[e]**	**6190**	**496000**	**217**	**1550**	**1550**	**92900**
Industrial SSL[b]				**na**	**145000**	**310[f]**	**22700**	**1820000**	**795**	**5680**	**5680**	**341000**
Residential SSL[b]				**na**	**10700**	**23[f]**	**1560**	**125000**	**54.8**	**391**	**391**	**23500**
MD21-10-21206	21-612262	10–11	SOIL	—	—	—	—	2.35	—	—	—	—
MD21-10-21207	21-612262	11–12	QBT3	—	—	—	—	2.32	—	1.04 (U)	—	—
MD21-10-21208	21-612263	10–11	SOIL	—	—	—	—	0.96 (J)	0.000541 (J+)	—	—	—
MD21-10-21209	21-612263	11–12	QBT3	—	—	—	—	0.989 (J)	—	1.04 (U)	—	—
MD21-10-21210	21-612264	10–11	SOIL	—	—	—	—	1.55	—	—	—	—
MD21-10-21211	21-612264	11–12	QBT3	—	—	—	—	1.39	—	0.937 (U)	—	—
MD21-10-21212	21-612265	10–11	SOIL	—	—	—	—	1.22	—	—	—	—
MD21-10-21213	21-612265	11–12	QBT3	—	—	—	—	1.29	—	1.01 (U)	—	—
MD21-10-21214	21-612266	10–11	SOIL	—	—	—	—	1.72	0.000577 (J+)	—	—	—
MD21-10-21215	21-612266	11–12	QBT3	—	—	—	—	2.03	0.00056 (J+)	1.06 (U)	—	—
MD21-10-21218	21-612268	10–11	SOIL	—	—	—	—	1.08 (J)	0.00139 (J+)	—	—	—
MD21-10-21204	21-613173	10–11	SOIL	—	—	—	—	0.997 (J)	—	—	—	—
MD21-10-21205	21-613173	11–12	QBT3	—	—	—	—	1.02 (J)	—	0.941 (U)	—	—
MD21-10-21216	21-613174	10–11	SOIL	—	—	—	—	1.03 (J)	—	—	—	—
MD21-10-21217	21-613174	11–12	QBT3	—	—	—	—	—	—	0.891 (U)	—	—
MD21-10-21220	21-613175	10–11	SOIL	—	—	—	—	1.95	—	—	—	—
MD21-10-21221	21-613175	11–12	QBT3	—	—	—	—	1.52	—	0.94 (U)	—	—
RE21-11-10194	21-614361	1–2	SOIL	—	—	—	—	2.47	—	—	—	—
RE21-11-10195	21-614361	3–4	QBT3	—	—	0.172	7.72	3.49	0.00271	0.955 (U)	—	118 (J-)
RE21-11-10196	21-614362	1–2	SOIL	—	—	—	—	5.2	0.00125 (J)	—	—	—
RE21-11-10197	21-614362	3–4	QBT3	—	—	—	—	2.27	—	1.06 (U)	—	—
RE21-11-10198	21-614363	1–2	QBT3	—	—	—	—	1.42	—	0.438 (J)	—	—
RE21-11-10199	21-614363	3–4	QBT3	—	—	—	—	1.36	—	0.986 (U)	—	—
RE21-11-10200	21-614364	1–2	QBT3	—	—	—	—	2.15	—	1.13 (U)	—	—
RE21-11-10201	21-614364	3–4	QBT3	—	—	—	—	1.51	—	0.443 (J)	—	—
RE21-11-10202	21-614365	1–2	SOIL	—	—	0.15	—	6.83	—	—	—	—
RE21-11-10203	21-614365	3–4	QBT3	—	—	—	—	5.24	—	1.03 (U)	—	—
RE21-11-10204	21-614366	1–2	SOIL	—	—	—	—	16.2	0.000729 (J)	—	—	—
RE21-11-10205	21-614366	3–4	QBT3	—	—	—	—	7.22	—	0.941 (U)	—	—
RE21-11-10206	21-614367	1–2	QBT3	—	—	—	—	3.12	—	0.353 (J)	—	—
RE21-11-10207	21-614367	3–4	QBT3	—	—	—	—	2.8	—	0.405 (J)	2.6 (U)	—

Table 7.1-18 (continued)

Sample ID	Location ID	Depth (ft)	Media	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Zinc
Qbt 2, 3, 4 BV[a]				**1690**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**63.5**
Soil BV[a]				**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**48.8**
Construction Worker SSL[b]				**na**	**463**	**92.9**[e]	**6190**	**496000**	**217**	**1550**	**1550**	**92900**
Industrial SSL[b]				**na**	**145000**	**310**[f]	**22700**	**1820000**	**795**	**5680**	**5680**	**341000**
Residential SSL[b]				**na**	**10700**	**23**[f]	**1560**	**125000**	**54.8**	**391**	**391**	**23500**
RE21-11-10208	21-614368	1–2	SOIL	—	—	—	—	3.67	—	—	—	—
RE21-11-10209	21-614368	3–4	QBT3	—	—	—	—	3.71	—	1.13 (U)	—	—
RE21-11-10210	21-614369	1–2	SOIL	—	—	—	—	16.3	—	—	—	—
RE21-11-10211	21-614369	3–4	QBT3	1910 (J+)	—	—	—	19	—	1.11 (U)	—	—
RE21-11-10212	21-614370	3–4	SOIL	—	—	—	—	2.27	—	—	—	—
RE21-11-10213	21-614370	5–6	SOIL	—	—	—	—	2.68	—	—	—	—
RE21-11-10214	21-614371	1–2	QBT3	—	—	—	—	3.19	—	0.969 (U)	—	—
RE21-11-10215	21-614371	3–4	QBT3	—	—	—	—	2.75	—	0.388 (J)	2.48 (U)	—
RE21-11-10216	21-614372	5–6	SOIL	—	—	—	—	2.19	0.000864 (J)	—	—	—
RE21-11-10217	21-614372	9–10	QBT3	—	—	—	—	3.11	0.00062 (J)	0.972 (UJ)	—	—
RE21-11-10218	21-614372	14–15	QBT3	—	587	—	—	4.35	—	0.994 (UJ)	—	—

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

[a] BVs are from LANL (1998, 059730).

[b] SSLs are from NMED (2009, 108070) unless otherwise noted.

[c] na = Not available.

[d] SSLs are for hexavalent chromium.

[e] Construction Worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2009, 108070).

[f] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[g] — = Not detected or not detected above BV.

Table 7.1-19
Organic Chemicals Detected at Former Building 21-209 and Associated Former Structure 21-466 Footprints

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Anthracene	Aroclor-1254	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate
Construction Worker SSL[a]				**18600**	**6680**[b]	**66800**	**4.36**	**213**	**21.3**	**213**	**6680**[b]	**2060**	**4760**	**47600**[c]
Industrial SSL[a]				**36700**	**18300**[b]	**183000**	**8.26**	**23.4**	**2.34**	**23.4**	**18300**[b]	**234**	**1370**	**9100**[d]
Residential SSL[a]				**3440**	**1720**[b]	**17200**	**1.12**	**6.21**	**0.621**	**6.21**	**1720**[b]	**62.1**	**347**	**2600**[d]
MD21-10-21206	21-612262	10–11	SOIL	—[e]	—	—	0.003 (J)	—	—	—	—	—	—	—
MD21-10-21207	21-612262	11–12	QBT3	—	—	—	—	—	—	—	—	—	—	—
MD21-10-21208	21-612263	10–11	SOIL	—	—	—	0.0034 (J)	—	—	—	—	—	—	—
MD21-10-21209	21-612263	11–12	QBT3	—	—	—	—	—	—	—	—	—	—	—
MD21-10-21210	21-612264	10–11	SOIL	—	—	—	0.0015 (J)	—	—	—	—	—	—	—
MD21-10-21211	21-612264	11–12	QBT3	—	—	—	—	—	—	—	—	—	—	—
MD21-10-21212	21-612265	10–11	SOIL	—	—	—	NA[f]	—	—	—	—	—	—	—
MD21-10-21214	21-612266	10–11	SOIL	—	—	—	NA	—	—	—	—	—	—	—
MD21-10-21218	21-612268	10–11	SOIL	—	—	—	NA	—	—	—	—	—	—	—
MD21-10-21204	21-613173	10–11	SOIL	—	—	—	—	—	—	—	—	—	—	—
MD21-10-21205	21-613173	11–12	QBT3	—	—	—	—	—	—	—	—	—	—	—
MD21-10-21216	21-613174	10–11	SOIL	—	—	—	NA	—	—	—	—	—	—	—
MD21-10-21217	21-613174	11–12	QBT3	—	—	—	NA	—	—	—	—	—	—	—
MD21-10-21220	21-613175	10–11	SOIL	—	—	—	NA	—	—	—	—	—	—	—
MD21-10-21221	21-613175	11–12	QBT3	—	—	—	NA	—	—	—	—	—	—	—
RE21-11-10194	21-614361	1–2	SOIL	0.123	—	0.209	NA	0.238	0.207	0.248	0.157	0.0954	—	—
RE21-11-10195	21-614361	3–4	QBT3	0.914	—	1.66	NA	3.12	2.85	3.89	1.75	1.57	0.505 (J)	171
RE21-11-10196	21-614362	1–2	SOIL	0.398	—	0.622	NA	0.718	0.686	0.87	0.352	0.411	—	—
RE21-11-10197	21-614362	3–4	QBT3	0.0705	—	0.11	NA	0.128	0.13	0.146	0.0885	0.0618	—	—
RE21-11-10198	21-614363	1–2	QBT3	0.113	—	0.189	NA	0.24	0.217	0.242	0.123	0.106	—	—
RE21-11-10199	21-614363	3–4	QBT3	—	—	0.0163 (J)	NA	0.0236 (J)	0.0181 (J)	0.0216 (J)	0.015 (J)	0.0122 (J)	—	—
RE21-11-10200	21-614364	1–2	QBT3	—	—	0.0106 (J)	NA	0.0368 (J)	0.0421	0.0557	0.022 (J)	0.0265 (J)	—	—
RE21-11-10202	21-614365	1–2	SOIL	0.154	—	0.225	NA	0.275	0.269	0.326	0.156	0.126	—	—

Table 7.1-19 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Anthracene	Aroclor-1254	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate
Construction Worker SSL[a]				**18600**	**6680[b]**	**66800**	**4.36**	**213**	**21.3**	**213**	**6680[b]**	**2060**	**4760**	**47600[c]**
Industrial SSL[a]				**36700**	**18300[b]**	**183000**	**8.26**	**23.4**	**2.34**	**23.4**	**18300[b]**	**234**	**1370**	**9100[d]**
Residential SSL[a]				**3440**	**1720[b]**	**17200**	**1.12**	**6.21**	**0.621**	**6.21**	**1720[b]**	**62.1**	**347**	**2600[d]**
RE21-11-10203	21-614365	3–4	QBT3	0.419	—	0.617	NA	0.617	0.546	0.658	0.296	0.265	—	—
RE21-11-10204	21-614366	1–2	SOIL	0.398	—	0.826	NA	0.849	0.762	0.891	0.308	0.377	—	—
RE21-11-10205	21-614366	3–4	QBT3	0.0847	0.0112 (J)	0.279	NA	0.955	0.659	1.63	0.284	0.552	—	—
RE21-11-10206	21-614367	1–2	QBT3	—	—	—	NA	0.0118 (J)	—	—	—	—	—	—
RE21-11-10207	21-614367	3–4	QBT3	—	—	—	NA	—	—	—	—	—	—	—
RE21-11-10209	21-614368	3–4	QBT3	—	—	—	NA	—	—	—	—	—	—	—
RE21-11-10211	21-614369	3–4	QBT3	—	—	—	NA	—	—	—	—	—	—	—
RE21-11-10212	21-614370	3–4	SOIL	0.0515	—	0.0867	NA	0.119	0.101	0.118	0.0597	0.0518	—	—
RE21-11-10213	21-614370	5–6	SOIL	2.28	—	4.63	NA	4.1	3.45	3.88	1.94	1.37	—	—
RE21-11-10214	21-614371	1–2	QBT3	0.0374	—	0.0827	—	0.113	0.108	0.125	0.052 (J)	0.0442	—	—
RE21-11-10215	21-614371	3–4	QBT3	—	—	—	—	0.0122 (J)	—	—	—	—	—	—

Table 7.1-19 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Dichloroethane[1,2-]	Diethylphthalate	Di-n-butylphthalate	Di-n-octylphthalate	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)
Construction Worker SSL[a]				**20600**	**21.3**	**552[c]**	**751**	**191000**	**23800**	**23800[g]**	**8910**	**8910**	**na[h]**	**na**
Industrial SSL[a]				**2340**	**2.34**	**1000[d]**	**42.8**	**547000**	**68400**	**68400[g]**	**24400**	**24400**	**na**	**na**
Residential SSL[a]				**621**	**0.621**	**78[d]**	**7.74**	**48900**	**6110**	**6110[g]**	**2290**	**2290**	**na**	**na**
MD21-10-21206	21-612262	10–11	SOIL	—	—	—	—	—	—	—	—	—	0.00000467 (J)	0.000008 (J)
MD21-10-21207	21-612262	11–12	QBT3	—	—	—	—	—	—	—	—	—	—	0.00000316 (J)
MD21-10-21208	21-612263	10–11	SOIL	—	—	—	—	—	—	—	—	—	0.00000627 (J)	0.0000108 (J)
MD21-10-21209	21-612263	11–12	QBT3	—	—	—	—	—	—	—	—	—	0.00000466 (J)	0.00000799 (J)
MD21-10-21210	21-612264	10–11	SOIL	—	—	—	—	—	—	—	—	—	0.00000334 (J)	0.00000577 (J)
MD21-10-21211	21-612264	11–12	QBT3	—	—	—	—	—	—	—	—	—	—	0.00000497 (J)
MD21-10-21212	21-612265	10–11	SOIL	—	—	—	—	—	—	—	—	—	NA	NA
MD21-10-21214	21-612266	10–11	SOIL	—	—	—	0.000461 (J)	—	—	0.076 (J)	—	—	NA	NA
MD21-10-21218	21-612268	10–11	SOIL	—	—	—	—	—	—	—	—	—	NA	NA
MD21-10-21204	21-613173	10–11	SOIL	—	—	—	—	—	—	—	—	—	0.0000202 (J)	0.0000347
MD21-10-21205	21-613173	11–12	QBT3	—	—	—	—	—	—	—	—	—	0.0000186 (J)	0.0000318
MD21-10-21216	21-613174	10–11	SOIL	—	—	—	—	—	—	—	—	—	NA	NA
MD21-10-21217	21-613174	11–12	QBT3	—	—	—	—	—	—	—	—	—	NA	NA
MD21-10-21220	21-613175	10–11	SOIL	—	—	—	—	—	—	—	—	—	NA	NA
MD21-10-21221	21-613175	11–12	QBT3	—	—	—	—	—	—	—	—	—	NA	NA
RE21-11-10194	21-614361	1–2	SOIL	0.223	0.0452	—	—	—	—	—	0.595	0.113	NA	NA
RE21-11-10195	21-614361	3–4	QBT3	3.18	0.544	0.449 (J)	—	—	0.764 (J)	—	7.02	0.787	NA	NA
RE21-11-10196	21-614362	1–2	SOIL	0.686	—	0.203 (J)	—	—	—	—	1.91	0.366	NA	NA
RE21-11-10197	21-614362	3–4	QBT3	0.133	0.069	—	—	—	—	—	0.324	0.0565	NA	NA
RE21-11-10198	21-614363	1–2	QBT3	0.215	0.0348	—	—	—	—	—	0.65	0.0979	NA	NA
RE21-11-10199	21-614363	3–4	QBT3	0.0195 (J)	—	—	—	—	—	—	0.0612	—	NA	NA
RE21-11-10200	21-614364	1–2	QBT3	0.0277 (J)	—	—	—	—	—	—	0.0481	—	NA	NA
RE21-11-10202	21-614365	1–2	SOIL	0.267	—	0.0817 (J)	—	—	—	—	0.795	0.144	NA	NA
RE21-11-10203	21-614365	3–4	QBT3	0.566	—	0.228 (J)	—	—	—	—	1.74	0.352	NA	NA
RE21-11-10204	21-614366	1–2	SOIL	0.835	0.0846	0.234 (J)	—	—	—	—	2.56	0.43	NA	NA
RE21-11-10205	21-614366	3–4	QBT3	1.63	0.0948	—	—	0.102 (J)	—	—	0.845	0.0857	NA	NA

Table 7.1-19 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Dichloroethane[1,2-]	Diethylphthalate	Di-n-butylphthalate	Di-n-octylphthalate	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)
Construction Worker SSL[a]				**20600**	**21.3**	**552[c]**	**751**	**191000**	**23800**	**23800[g]**	**8910**	**8910**	**na[h]**	**na**
Industrial SSL[a]				**2340**	**2.34**	**1000[d]**	**42.8**	**547000**	**68400**	**68400[g]**	**24400**	**24400**	**na**	**na**
Residential SSL[a]				**621**	**0.621**	**78[d]**	**7.74**	**48900**	**6110**	**6110[g]**	**2290**	**2290**	**na**	**na**
RE21-11-10206	21-614367	1–2	QBT3	—	—	—	—	0.336 (J)	—	—	0.02 (J)	—	NA	NA
RE21-11-10207	21-614367	3–4	QBT3	—	—	—	—	0.368	—	—	—	—	NA	NA
RE21-11-10209	21-614368	3–4	QBT3	—	—	—	—	—	—	—	0.0113 (J)	—	NA	NA
RE21-11-10211	21-614369	3–4	QBT3	—	—	—	—	—	—	—	—	—	NA	NA
RE21-11-10212	21-614370	3–4	SOIL	0.103	0.0158 (J)	—	—	—	—	—	0.267	0.0547	NA	NA
RE21-11-10213	21-614370	5–6	SOIL	4.13	1.13	1.46 (J)	—	—	—	—	12.8	2.36	NA	NA
RE21-11-10214	21-614371	1–2	QBT3	0.113	—	—	—	0.0891 (J)	—	—	0.32	0.0388	0.0000019 (J)	0.00000411 (J)
RE21-11-10215	21-614371	3–4	QBT3	—	—	—	—	—	—	—	0.0219 (J)	—	—	—

Table 7.1-19 (continued)

Sample ID	Location ID	Depth (ft)	Media	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Methylene Chloride
Construction Worker SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**213**	**10600**
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**23.4**	**1090**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**6.21**	**199**
MD21-10-21206	21-612262	10–11	SOIL	0.00000205 (J)	—	0.00000476	—	0.000000822 (J)	—	—	—	0.00000348 (J)	—	—
MD21-10-21207	21-612262	11–12	QBT3	0.000000984 (J)	—	0.00000193 (J)	—	—	—	—	—	0.000000711 (J)	—	—
MD21-10-21208	21-612263	10–11	SOIL	0.00000437 (J)	—	0.00000933	—	—	—	—	—	0.00000526	—	—
MD21-10-21209	21-612263	11–12	QBT3	0.00000319 (J)	—	0.00000675	—	0.000000724 (J)	—	—	—	0.0000049	—	—
MD21-10-21210	21-612264	10–11	SOIL	0.0000017 (J)	—	0.00000407 (J)	—	0.00000053 (J)	0.00000234 (J)	0.000000553 (J)	—	0.00000528	—	—
MD21-10-21211	21-612264	11–12	QBT3	0.00000142 (J)	—	0.0000034 (J)	—	—	0.00000163 (J)	—	—	0.00000353 (J)	—	—
MD21-10-21212	21-612265	10–11	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	0.00476 (J)
MD21-10-21214	21-612266	10–11	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	0.00393 (J)
MD21-10-21218	21-612268	10–11	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	0.00271 (J)
MD21-10-21204	21-613173	10–11	SOIL	0.00000936	0.000000492 (J)	0.0000219	0.00000125 (J)	0.00000638 (J)	—	0.000000632 (J)	0.000000741 (J)	0.0000187	—	—
MD21-10-21205	21-613173	11–12	QBT3	0.00000969	—	0.0000221	0.000000984 (J)	0.00000519 (J)	—	—	0.000000541 (J)	0.000015	—	—
MD21-10-21216	21-613174	10–11	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	0.00303 (J)
MD21-10-21217	21-613174	11–12	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	0.00209 (J)
MD21-10-21220	21-613175	10–11	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	0.00331 (J)
MD21-10-21221	21-613175	11–12	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	0.00326 (J)
RE21-11-10194	21-614361	1–2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.132	—
RE21-11-10195	21-614361	3–4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.6	—
RE21-11-10196	21-614362	1–2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.31	—
RE21-11-10197	21-614362	3–4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0629	—
RE21-11-10198	21-614363	1–2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.114	—
RE21-11-10199	21-614363	3–4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	—
RE21-11-10200	21-614364	1–2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0167 (J)	—
RE21-11-10202	21-614365	1–2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.132	—
RE21-11-10203	21-614365	3–4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.277	—
RE21-11-10204	21-614366	1–2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.293	—
RE21-11-10205	21-614366	3–4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.285	—

Table 7.1-19 (continued)

Sample ID	Location ID	Depth (ft)	Media	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Methylene Chloride
Construction Worker SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**213**	**10600**
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**23.4**	**1090**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**6.21**	**199**
RE21-11-10206	21-614367	1–2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	—
RE21-11-10207	21-614367	3–4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	—
RE21-11-10209	21-614368	3–4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	—
RE21-11-10211	21-614369	3–4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	0.0025 (J)
RE21-11-10212	21-614370	3–4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0471	—
RE21-11-10213	21-614370	5–6	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.77	—
RE21-11-10214	21-614371	1–2	QBT3	—	—	0.000000909 (J)	—	—	—	—	—	—	0.0499	—
RE21-11-10215	21-614371	3–4	QBT3	—	—	—	—	—	—	—	—	—	—	—

Table 7.1-19 (continued)

Sample ID	Location ID	Depth (ft)	Media	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzofurans (Totals)	Trimethylbenzene[1,2,4-]
Construction Worker SSL[a]				**1240[c]**	**702**	**na**	**na**	**na**	**na**	**7150**	**6680**	**na**	**688[c]**
Industrial SSL[a]				**4100[d]**	**252**	**na**	**na**	**na**	**na**	**20500**	**18300**	**na**	**260[d]**
Residential SSL[a]				**310[d]**	**45**	**na**	**na**	**na**	**na**	**1830**	**1720**	**na**	**62[d]**
MD21-10-21206	21-612262	10–11	SOIL	—	—	0.0000237 (J)	—	0.00000054 (J)	0.00000137 (J)	—	—	—	—
MD21-10-21207	21-612262	11–12	QBT3	—	—	—	—	—	—	—	—	—	—
MD21-10-21208	21-612263	10–11	SOIL	—	—	0.0000337 (J)	—	—	0.00000068 (J)	—	—	—	—
MD21-10-21209	21-612263	11–12	QBT3	—	—	0.0000266 (J)	—	—	0.000000876 (J)	—	—	—	—
MD21-10-21210	21-612264	10–11	SOIL	—	—	0.0000229 (J)	—	0.00000279 (J)	0.0000047	—	—	—	—
MD21-10-21211	21-612264	11–12	QBT3	—	—	0.0000193 (J)	—	0.00000226 (J)	0.00000333 (J)	—	—	—	—
MD21-10-21212	21-612265	10–11	SOIL	—	—	NA	NA	NA	NA	—	—	NA	—
MD21-10-21214	21-612266	10–11	SOIL	—	—	NA	NA	NA	NA	—	—	NA	—
MD21-10-21218	21-612268	10–11	SOIL	—	—	NA	NA	NA	NA	—	—	NA	—
MD21-10-21204	21-613173	10–11	SOIL	—	—	0.000133	0.0000117 (J)	0.000000902 (J)	0.00000752	—	—	—	—
MD21-10-21205	21-613173	11–12	QBT3	—	—	0.000113	0.0000117 (J)	—	0.00000355 (J)	—	—	—	—
MD21-10-21216	21-613174	10–11	SOIL	—	—	NA	NA	NA	NA	—	—	NA	—
MD21-10-21217	21-613174	11–12	QBT3	—	—	NA	NA	NA	NA	—	—	NA	—
MD21-10-21220	21-613175	10–11	SOIL	—	—	NA	NA	NA	NA	—	—	NA	—
MD21-10-21221	21-613175	11–12	QBT3	—	—	NA	NA	NA	NA	—	—	NA	—
RE21-11-10194	21-614361	1–2	SOIL	0.0306 (J)	0.119	NA	NA	NA	NA	0.742	0.835	NA	—
RE21-11-10195	21-614361	3–4	QBT3	0.217	0.75	NA	NA	NA	NA	6.36	10	NA	0.000466 (J)
RE21-11-10196	21-614362	1–2	SOIL	0.0941	0.407	NA	NA	NA	NA	2.17	2.38 (J)	NA	—
RE21-11-10197	21-614362	3–4	QBT3	0.018 (J)	0.0582	NA	NA	NA	NA	0.399	0.398	NA	—
RE21-11-10198	21-614363	1–2	QBT3	0.0314 (J)	0.121	NA	NA	NA	NA	0.623	0.599	NA	—
RE21-11-10199	21-614363	3–4	QBT3	—	—	NA	NA	NA	NA	0.0518	0.0515	NA	—
RE21-11-10200	21-614364	1–2	QBT3	—	—	NA	NA	NA	NA	0.0311 (J)	0.0568 (J)	NA	—
RE21-11-10202	21-614365	1–2	SOIL	0.0407	0.168	NA	NA	NA	NA	0.809	0.761 (J)	NA	—
RE21-11-10203	21-614365	3–4	QBT3	0.156	0.659	NA	NA	NA	NA	2.12	1.84 (J)	NA	—
RE21-11-10204	21-614366	1–2	SOIL	0.158	0.419	NA	NA	NA	NA	2.96	2.71	NA	—
RE21-11-10205	21-614366	3–4	QBT3	0.0289 (J)	0.0959	NA	NA	NA	NA	0.582	1.13	NA	—

Table 7.1-19 (continued)

Sample ID	Location ID	Depth (ft)	Media	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzofurans (Totals)	Trimethylbenzene[1,2,4-]
Construction Worker SSL[a]				**1240[c]**	**702**	**na**	**na**	**na**	**na**	**7150**	**6680**	**na**	**688[c]**
Industrial SSL[a]				**4100[d]**	**252**	**na**	**na**	**na**	**na**	**20500**	**18300**	**na**	**260[d]**
Residential SSL[a]				**310[d]**	**45**	**na**	**na**	**na**	**na**	**1830**	**1720**	**na**	**62[d]**
RE21-11-10206	21-614367	1–2	QBT3	—	—	NA	NA	NA	NA	0.0207 (J)	0.0221 (J)	NA	—
RE21-11-10207	21-614367	3–4	QBT3	—	—	NA	NA	NA	NA	—	—	NA	—
RE21-11-10209	21-614368	3–4	QBT3	—	—	NA	NA	NA	NA	0.0135 (J)	—	NA	—
RE21-11-10211	21-614369	3–4	QBT3	—	—	NA	NA	NA	NA	—	—	NA	—
RE21-11-10212	21-614370	3–4	SOIL	0.022 (J)	0.0695	NA	NA	NA	NA	0.312	0.342	NA	—
RE21-11-10213	21-614370	5–6	SOIL	1.1	4.02	NA	NA	NA	NA	15.4	11.7	NA	—
RE21-11-10214	21-614371	1–2	QBT3	0.0114 (J)	0.0488	0.0000288	—	—	—	0.273	0.25	—	—
RE21-11-10215	21-614371	3–4	QBT3	—	—	—	—	—	—	0.0219 (J)	0.0172 (J)	0.000000203 (J)	—

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

[a] SSLs are from NMED (2009, 108070) unless otherwise noted.

[b] Pyrene SSLs used as surrogate based on structural similarity.

[c] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2009, 108070).

[d] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[e] — = Not detected.

[f] NA = Not analyzed.

[g] Di-n-butyl phthalate SSLs used as surrogate based on structural similarity.

[h] na = Not available.

Table 7.1-20
Radionuclides Detected or Detected above BVs/FVs at
Former Building 21-209 and Associated Former Structure 21-466 Footprints

Sample ID	Location ID	Depth (ft)	Media	Plutonium-239/240	Tritium
Qbt 2, 3, 4 BV/FV[a]				**na[b]**	**na**
Soil BV/FV[a]				**0.054**	**na**
Construction Worker SAL[c]				**36**	**320000**
Industrial SAL[c]				**210**	**440000**
Residential SAL[c]				**33**	**750**
MD21-10-21206	21-612262	10–11	SOIL	—[d]	0.756669
MD21-10-21207	21-612262	11–12	QBT3	—	0.543091
MD21-10-21208	21-612263	10–11	SOIL	—	0.710366
MD21-10-21209	21-612263	11–12	QBT3	—	0.460671
MD21-10-21210	21-612264	10–11	SOIL	—	0.681008
MD21-10-21211	21-612264	11–12	QBT3	—	0.360331
MD21-10-21212	21-612265	10–11	SOIL	—	2.80381
MD21-10-21213	21-612265	11–12	QBT3	—	2.59917
MD21-10-21214	21-612266	10–11	SOIL	—	1.43552
MD21-10-21215	21-612266	11–12	QBT3	—	1.06444
MD21-10-21204	21-613173	10–11	SOIL	—	1.3443
MD21-10-21205	21-613173	11–12	QBT3	—	1.50563
MD21-10-21216	21-613174	10–11	SOIL	—	1.14127
MD21-10-21217	21-613174	11–12	QBT3	—	1.04867
MD21-10-21220	21-613175	10–11	SOIL	—	1.1699
MD21-10-21221	21-613175	11–12	QBT3	—	0.273943
RE21-11-10194	21-614361	1–2	SOIL	—	3.74884
RE21-11-10195	21-614361	3–4	QBT3	0.0592	8.64691
RE21-11-10196	21-614362	1–2	SOIL	0.0245	13.1926
RE21-11-10197	21-614362	3–4	QBT3	—	26.658
RE21-11-10198	21-614363	1–2	QBT3	—	14.0843
RE21-11-10199	21-614363	3–4	QBT3	—	14.3257
RE21-11-10200	21-614364	1–2	QBT3	—	88.6385
RE21-11-10201	21-614364	3–4	QBT3	—	11.05
RE21-11-10202	21-614365	1–2	SOIL	0.0515	13.9552
RE21-11-10203	21-614365	3–4	QBT3	—	4.14728
RE21-11-10204	21-614366	1–2	SOIL	—	18.5947
RE21-11-10205	21-614366	3–4	QBT3	0.0279	7.34754
RE21-11-10206	21-614367	1–2	QBT3	—	2.50382
RE21-11-10207	21-614367	3–4	QBT3	—	2.75131

Table 7.1-20 (continued)

Sample ID	Location ID	Depth (ft)	Media	Plutonium-239/240	Tritium
Qbt 2, 3, 4 BV/FV[a]				**na[b]**	**na**
Soil BV/FV[a]				**0.054**	**na**
Construction Worker SAL[c]				**36**	**320000**
Industrial SAL[c]				**210**	**440000**
Residential SAL[c]				**33**	**750**
RE21-11-10208	21-614368	1–2	SOIL	0.0348	22.0468
RE21-11-10209	21-614368	3–4	QBT3	—	23.1451
RE21-11-10210	21-614369	1–2	SOIL	—	16.2932
RE21-11-10211	21-614369	3–4	QBT3	—	19.3013
RE21-11-10212	21-614370	3–4	SOIL	—	13.9363
RE21-11-10213	21-614370	5–6	SOIL	—	14.9562
RE21-11-10214	21-614371	1–2	QBT3	—	18.3737
RE21-11-10215	21-614371	3–4	QBT3	—	7.6691
RE21-11-10216	21-614372	5–6	SOIL	0.0278	49.9295
RE21-11-10217	21-614372	9–10	QBT3	—	52.5687
RE21-11-10218	21-614372	14–15	QBT3	—	8.00301

Note: Results are in pCi/g.

[a] BVs are from LANL (1998, 059730).

[b] na = Not available.

[c] SALs are from LANL (2009, 107655).

[d] — = Not detected or not detected above BV/FV.

Table 7.1-21
Samples Collected and Analyses Requested at AOC 21-028(d)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic-Thorium	Isotopic-Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE21-11-10233	21-614373	1–2	SOIL	11-2405	11-2405	11-2405	11-2405	11-2405	11-2405	11-2405	11-2405	11-2406	11-2405	11-2405	11-2406	11-2405	11-2406	11-2405
RE21-11-10234	21-614373	5–6	QBT3	11-2405	11-2405	11-2405	11-2405	11-2405	11-2405	11-2405	11-2405	11-2406	11-2405	11-2405	11-2406	11-2405	11-2406	11-2405
RE21-11-10235	21-614373	10–11	QBT3	11-2405	11-2405	11-2405	11-2405	11-2405	11-2405	11-2405	11-2405	11-2406	11-2405	11-2405	11-2406	11-2405	11-2406	11-2405
RE21-11-10236	21-614374	1–2	SOIL	11-2405	11-2405	11-2405	11-2405	11-2405	11-2405	11-2405	11-2405	11-2406	11-2405	11-2405	11-2406	11-2405	11-2406	11-2405
RE21-11-10237	21-614374	5–6	QBT3	11-2405	11-2405	11-2405	11-2405	11-2405	11-2405	11-2405	11-2405	11-2406	11-2405	11-2405	11-2406	11-2405	11-2406	11-2405
RE21-11-10238	21-614374	10–11	QBT3	11-2420	11-2419	11-2420	11-2420	11-2420	11-2420	11-2420	11-2419	11-2418	11-2419	11-2420	11-2418	11-2420	11-2418	11-2419
RE21-11-10239	21-614375	1–2	SOIL	11-2420	11-2419	11-2420	11-2420	11-2420	11-2420	11-2420	11-2419	11-2418	11-2419	11-2420	11-2418	11-2420	11-2418	11-2419
RE21-11-10240	21-614375	5–6	QBT3	11-2420	11-2419	11-2420	11-2420	11-2420	11-2420	11-2420	11-2419	11-2418	11-2419	11-2420	11-2418	11-2420	11-2418	11-2419
RE21-11-10241	21-614375	10–11	QBT3	11-2451	11-2450	11-2451	11-2451	11-2451	11-2451	11-2451	11-2450	11-2449	11-2450	11-2451	11-2449	11-2451	11-2449	11-2450
RE21-11-10242	21-614376	1–2	SOIL	11-2451	11-2450	11-2451	11-2451	11-2451	11-2451	11-2451	11-2450	11-2449	11-2450	11-2451	11-2449	11-2451	11-2449	11-2450
RE21-11-10243	21-614376	5–6	QBT3	11-2451	11-2450	11-2451	11-2451	11-2451	11-2451	11-2451	11-2450	11-2449	11-2450	11-2451	11-2449	11-2451	11-2449	11-2450
RE21-11-10244	21-614376	10–11	QBT3	11-2451	11-2450	11-2451	11-2451	11-2451	11-2451	11-2451	11-2450	11-2449	11-2450	11-2451	11-2449	11-2451	11-2449	11-2450
RE21-11-10245	21-614377	1–2	QBT3	11-2451	11-2450	11-2451	11-2451	11-2451	11-2451	11-2451	11-2450	11-2449	11-2450	11-2451	11-2449	11-2451	11-2449	11-2450
RE21-11-10246	21-614377	5–6	QBT3	11-2451	11-2450	11-2451	11-2451	11-2451	11-2451	11-2451	11-2450	11-2449	11-2450	11-2451	11-2449	11-2451	11-2449	11-2450
RE21-11-10247	21-614377	10–11	QBT3	11-2451	11-2450	11-2451	11-2451	11-2451	11-2451	11-2451	11-2450	11-2449	11-2450	11-2451	11-2449	11-2451	11-2449	11-2450
RE21-11-10248	21-614378	1–2	QBT3	11-2485	11-2485	11-2485	11-2485	11-2485	11-2485	11-2485	11-2485	11-2485	11-2485	11-2485	11-2485	11-2485	11-2485	11-2485
RE21-11-10249	21-614378	5–6	QBT3	11-2496	11-2496	11-2496	11-2496	11-2496	11-2496	11-2496	11-2496	11-2497	11-2496	11-2496	11-2497	11-2496	11-2497	11-2496
RE21-11-10250	21-614378	10–11	QBT3	11-2496	11-2496	11-2496	11-2496	11-2496	11-2496	11-2496	11-2496	11-2497	11-2496	11-2496	11-2497	11-2496	11-2497	11-2496

Table 7.1-22
Inorganic Chemicals above BVs at AOC 21-028(d)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
Qbt 2, 3, 4 BV[a]				**0.5**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**482**	**0.1**	**6.58**	**na[b]**	**na**	**0.3**	**1**	**17**	**63.5**
Soil BV[a]				**0.83**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**39.6**	**48.8**
Construction Worker SSL[c]				**124**	**4350**	**309**	**na**	**449[d]**	**34.6[e]**	**12400**	**800**	**463**	**92.9[e]**	**6190**	**496000**	**217**	**1550**	**1550**	**1550**	**92900**
Industrial SSL[c]				**454**	**224000**	**1120**	**na**	**2920[d]**	**300[f]**	**45400**	**800**	**145000**	**310[f]**	**22700**	**1820000**	**795**	**5680**	**5680**	**5680**	**341000**
Residential SSL[c]				**31.3**	**15600**	**77.9**	**na**	**219[d]**	**23[f]**	**3130**	**400**	**10700**	**23[f]**	**1560**	**125000**	**54.8**	**391**	**391**	**391**	**23500**
RE21-11-10233	21-614373	1–2	SOIL	1.21	—[g]	—	—	—	—	—	—	—	—	—	1.83	—	—	—	—	—
RE21-11-10234	21-614373	5–6	QBT3	1.04 (U)	—	—	—	7.26	—	—	—	—	—	—	1.42	—	1.1 (U)	—	—	—
RE21-11-10235	21-614373	10–11	QBT3	0.634 (J)	—	—	—	8.85	—	—	—	—	—	—	1.37	—	1.05 (U)	2.58 (U)	—	—
RE21-11-10236	21-614374	1–2	SOIL	1.23	—	0.468 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE21-11-10237	21-614374	5–6	QBT3	1.05 (U)	—	—	—	—	—	—	—	—	—	—	1.42	—	1.05 (U)	—	—	—
RE21-11-10238	21-614374	10–11	QBT3	0.714 (U)	—	—	—	12.3 (J)	—	—	—	—	—	—	1.22	—	0.626 (J)	—	—	—
RE21-11-10239	21-614375	1–2	SOIL	1.53 (U)	—	0.48 (U)	8590	33.5 (J)	—	—	—	—	—	—	4.35	0.0831	—	—	—	—
RE21-11-10240	21-614375	5–6	QBT3	1.25 (U)	61.6	—	3560	14.4 (J)	—	6.29	—	—	—	9.93	1.76	0.000774 (J)	0.679 (J)	—	—	—
RE21-11-10241	21-614375	10–11	QBT3	1.05 (UJ)	—	—	—	19.2	—	12.2	—	—	—	—	1.66	0.00121 (J)	1.03 (U)	—	—	—
RE21-11-10242	21-614376	1–2	SOIL	1.02 (UJ)	—	0.51 (U)	21900	26	—	14.8	—	—	—	—	1.68	0.0015 (J)	—	—	—	120
RE21-11-10243	21-614376	5–6	QBT3	1.08 (UJ)	56.1	—	—	21.9	—	6.52	17.9	931	—	13.3	1.66	—	1.03 (U)	—	—	—
RE21-11-10244	21-614376	10–11	QBT3	1.04 (UJ)	—	—	—	18.1	—	—	—	—	—	—	1.7	—	1.05 (U)	—	—	—
RE21-11-10245	21-614377	1–2	QBT3	1.1 (UJ)	54.9	—	5610	—	—	7.4	—	—	—	—	4.52	—	1.04 (U)	—	—	—
RE21-11-10246	21-614377	5–6	QBT3	1.13 (UJ)	52.3	—	—	16.9	—	—	—	—	—	—	2.23	—	1.08 (U)	—	—	—
RE21-11-10247	21-614377	10–11	QBT3	1.11 (UJ)	—	—	—	21.6	—	—	—	—	—	—	1.45	—	1.05 (U)	—	—	—
RE21-11-10248	21-614378	1–2	QBT3	1.6	55.4	—	3550 (J+)	37.8 (J)	3.17	13.9 (J)	—	—	0.118	—	8.4	—	0.986 (UJ)	1.29 (U)	17.1	—
RE21-11-10249	21-614378	5–6	QBT3	—	—	—	—	17	—	—	—	—	—	—	—	—	1.1 (U)	—	—	—
RE21-11-10250	21-614378	10–11	QBT3	1.06 (U)	—	—	—	—	—	—	—	—	—	—	—	—	1.1 (U)	—	—	—

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

[a] BVs are from LANL (1998, 059730).

[b] na = Not available.

[c] SSLs are from NMED (2009, 108070) unless otherwise noted.

[d] SSLs are for hexavalent chromium.

[e] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov.earth1r6/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2009, 108070).

[f] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[g] — = Not detected or not detected above BV.

Table 7.1-23
Organic Chemicals Detected at AOC 21-028(d)

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	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran
Construction Worker SSL[a]				**18600**	**263000**	**66800**	**7.58**	**4.36**	**75.8**	**213**	**21.3**	**213**	**6680**[b]	**2060**	**4760**	**20600**	**21.3**	**552**[c]
Industrial SSL[a]				**36700**	**851000**	**183000**	**8.26**	**8.26**	**8.26**	**23.4**	**2.34**	**23.4**	**18300**[b]	**234**	**1370**	**2340**	**2.34**	**1000**[d]
Residential SSL[a]				**3440**	**67500**	**17200**	**2.22**	**1.12**	**2.22**	**6.21**	**0.621**	**6.21**	**1720**[b]	**62.1**	**347**	**621**	**0.621**	**78**[d]
RE21-11-10233	21-614373	1–2	SOIL	1.07	—[e]	1.77	—	—	—	1.91	1.6	2.01	1.09	0.752	—	1.68	—	0.617 (J)
RE21-11-10234	21-614373	5–6	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE21-11-10235	21-614373	10–11	QBT3	—	—	0.0155 (J)	—	—	—	0.0212 (J)	0.0144 (J)	0.0205 (J)	0.0108 (J)	—	—	0.0137 (J)	—	—
RE21-11-10236	21-614374	1–2	SOIL	1.3	—	2.31	—	—	—	2.18	1.77	2.28	1.11	0.974	—	2.08	—	0.784
RE21-11-10237	21-614374	5–6	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE21-11-10238	21-614374	10–11	QBT3	—	0.00408 (J)	0.00768 (J)	—	0.0066 (J)	—	0.0135 (J)	—	—	—	—	—	—	—	—
RE21-11-10239	21-614375	1–2	SOIL	2.04	—	3.41	0.0336 (J)	0.0538	0.0221 (J)	3	2.78	3.17	1.6	1.22	—	3.1	1.08	1.37 (J)
RE21-11-10240	21-614375	5–6	QBT3	0.0196 (J)	0.00625 (J)	0.0464	—	0.0149 (J)	—	0.0606	0.0518	0.0572	0.023 (J)	0.0234 (J)	—	0.0491	0.0169 (J)	—
RE21-11-10241	21-614375	10–11	QBT3	0.0665	—	0.113	—	0.0156 (J)	—	0.12	0.103	0.116	0.0538	0.048	—	0.119	0.0189 (J)	—
RE21-11-10242	21-614376	1–2	SOIL	13	0.00415 (J)	24	0.17	0.177	—	22.8	19.1	21.8	9.09	8.21	—	24.3	3.21	9.9 (J)
RE21-11-10243	21-614376	5–6	QBT3	0.0859	—	0.162	—	—	—	0.167	0.145	0.157	0.0874	0.062	—	0.174	0.0236 (J)	—
RE21-11-10244	21-614376	10–11	QBT3	0.0928	—	0.175	—	—	—	0.176	0.157	0.166	0.0906	0.0639	—	0.179	0.0249 (J)	—
RE21-11-10245	21-614377	1–2	QBT3	0.267	—	0.509	—	0.0604	0.0265 (J)	0.62	0.564	0.756	0.311	0.266	—	0.649	0.0834	0.17 (J)
RE21-11-10246	21-614377	5–6	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE21-11-10247	21-614377	10–11	QBT3	—	—	—	—	—	—	0.0125 (J)	—	—	—	—	—	—	—	—
RE21-11-10248	21-614378	1–2	QBT3	0.102	—	0.181	—	0.016 (J)	—	0.273	0.248	0.261	0.168	0.115	0.222 (J)	0.275	—	—
RE21-11-10249	21-614378	5–6	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE21-11-10250	21-614378	10–11	QBT3	0.0578	—	0.0909	—	—	—	0.0994	0.0913	0.0998	0.06	0.0412	—	0.0924	—	—

Table 7.1-23 (continued)

Sample ID	Location ID	Depth (ft)	Media	Diethylphthalate	Ethylbenzene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene	Trimethylbenzene[1,2,4-]	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
Construction Worker SSL[a]				**191000**	**6630**	**8910**	**8910**	**213**	**10600**	**1240[c]**	**702**	**7150**	**6680**	**21100**	**688[c]**	**27500**	**3130[f]**
Industrial SSL[a]				**547000**	**385**	**24400**	**24400**	**23.4**	**1090**	**4100[d]**	**252**	**20500**	**18300**	**57900**	**260[d]**	**31500**	**3610[f]**
Residential SSL[a]				**48900**	**69.7**	**2290**	**2290**	**6.21**	**199**	**310[d]**	**45**	**1830**	**1720**	**5570**	**62[d]**	**9550**	**1090[f]**
RE21-11-10233	21-614373	1–2	SOIL	—	—	5.65	0.984	0.941	—	0.296	1.08	6.13	4.72	—	—	—	—
RE21-11-10234	21-614373	5–6	QBT3	—	—	0.0138 (J)	—	—	—	—	—	0.0142 (J)	0.015 (J)	—	—	—	—
RE21-11-10235	21-614373	10–11	QBT3	—	—	0.0511	—	—	—	—	—	0.0493	0.0446	—	—	—	—
RE21-11-10236	21-614374	1–2	SOIL	—	—	6.74	1.26	1.04	0.00252 (J)	0.362	1.25	8.16	7.15	0.000438 (J)	—	—	0.000374 (J)
RE21-11-10237	21-614374	5–6	QBT3	0.284 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE21-11-10238	21-614374	10–11	QBT3	—	—	0.0271 (J)	—	—	—	—	—	0.0238 (J)	0.0212 (J)	—	—	—	—
RE21-11-10239	21-614375	1–2	SOIL	—	—	9.71	2.02	1.44	—	1.01	4.38	12	8.17	—	0.000346 (J)	—	—
RE21-11-10240	21-614375	5–6	QBT3	—	—	0.133	0.0238 (J)	0.0207 (J)	—	—	0.0272 (J)	0.157	0.15	—	—	—	—
RE21-11-10241	21-614375	10–11	QBT3	—	—	0.34	0.0734	0.049	—	0.0302 (J)	0.101	0.392	0.311	—	—	—	—
RE21-11-10242	21-614376	1–2	SOIL	—	0.000607 (J)	69.2	15.4	9.29	0.00242 (J)	7.06	32.5	83.6	61.9	0.000883 (J)	0.00162	0.000486 (J)	0.00115 (J)
RE21-11-10243	21-614376	5–6	QBT3	—	—	0.482	0.0981	0.0752	—	0.0365 (J)	0.155	0.555	0.443	—	—	—	—
RE21-11-10244	21-614376	10–11	QBT3	—	—	0.517	0.108	0.0794	—	0.0426	0.199	0.614	0.431	—	—	—	—
RE21-11-10245	21-614377	1–2	QBT3	—	—	1.72	0.294	0.284	—	0.0811	0.309	1.9	2	—	—	—	—
RE21-11-10246	21-614377	5–6	QBT3	—	—	0.0198 (J)	—	—	—	—	—	0.0217 (J)	0.0346 (J)	—	—	—	—
RE21-11-10247	21-614377	10–11	QBT3	—	—	0.0176 (J)	—	—	—	—	—	0.0202 (J)	0.029 (J)	—	—	—	—
RE21-11-10248	21-614378	1–2	QBT3	—	—	0.692	0.101	0.152	—	0.0331 (J)	0.132	0.653	0.603	—	—	—	—
RE21-11-10249	21-614378	5–6	QBT3	—	—	0.0114 (J)	—	—	—	—	—	0.0121 (J)	0.0129 (J)	—	—	—	—
RE21-11-10250	21-614378	10–11	QBT3	—	—	0.256	0.0556	0.0537	—	0.0239 (J)	0.0939	0.298	0.257	—	—	—	—

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

[a] SSLs are from NMED (2009, 108070) unless otherwise noted.

[b] Pyrene SSL used as surrogate based on structural similarity.

[c] Construction worker SSL calculated using toxicity value from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm) and equation and parameters from NMED (2009, 108070).

[d] EPA regional screening level (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[e] — = Not detected.

[f] Xylenes SSL used as surrogate based on structural similarity.

Table 7.1-24
Radionuclides Detected or Detected above BVs/FVs at AOC 21-028(d)

Sample ID	Location ID	Depth (ft)	Media	Tritium
Qbt 2, 3, 4 BV/FV[a]				**na[b]**
Soil BV/FV[a]				**na**
Construction Worker SAL[c]				**320000**
Industrial SAL[c]				**440000**
Residential SAL[c]				**750**
RE21-11-10233	21-614373	1–2	SOIL	14.1
RE21-11-10236	21-614374	1–2	SOIL	18.7
RE21-11-10238	21-614374	10–11	QBT3	2.1971
RE21-11-10239	21-614375	1–2	SOIL	20.0237
RE21-11-10240	21-614375	5–6	QBT3	2.98092
RE21-11-10241	21-614375	10–11	QBT3	2.79338
RE21-11-10242	21-614376	1–2	SOIL	61.6604
RE21-11-10243	21-614376	5–6	QBT3	1.11021
RE21-11-10244	21-614376	10–11	QBT3	0.928004
RE21-11-10245	21-614377	1–2	QBT3	8.57784
RE21-11-10246	21-614377	5–6	QBT3	5.9
RE21-11-10247	21-614377	10–11	QBT3	1.10477
RE21-11-10248	21-614378	1–2	QBT3	21.2063
RE21-11-10249	21-614378	5–6	QBT3	5.63808
RE21-11-10250	21-614378	10–11	QBT3	7.58383

Note: Results are in pCi/g.

[a] BVs/FVs are from LANL (1998, 059730).

[b] na = Not available.

[c] SALs are from LANL (2009, 107655).

Appendix A

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

A-1.0 ACRONYMS AND ABBREVIATIONS

AOC	area of concern
bgs	below ground surface
BV	background value
CCV	continuing calibration verification
COC	chain of custody
Consent Order	Compliance Order on Consent
COPC	chemical of potential concern
D&D	decontamination and decommissioning
DER	duplicate error ratio
DGPS	differential global positioning system
DL	detection limit
dpm	disintegrations per minute
DOE	Department of Energy (U.S.)
DRO	diesel range organics
EPA	Environmental Protection Agency (U.S.)
EQL	estimated quantitation limit
ESL	ecological screening level
FV	fallout value
GC	gas chromatography
GC MS	gas chromatography mass spectrometry
GRO	gasoline range organics
ICS	interference check sample
ICV	initial calibration verification
I.D.	inside diameter
IDW	investigation-derived waste
IS	internal standard
LAL	lower acceptance limit
LANL	Los Alamos National Laboratory
LASL	Los Alamos Scientific Laboratory
LCS	laboratory control sample
LLW	low-level waste
MDA	material disposal area

MDC	minimum detectable concentration
MDL	method detection limit
MS	matrix spike
MSD	matrix spike duplicate
NMED	New Mexico Environment Department
%R	percent recovery
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PID	photoionization detector
QA	quality assurance
QC	quality control
RCT	radiation control technician
RER	relative error ratio
RFI	RCRA facility investigation
RL	reporting limit
RPD	relative percent difference
RRF	relative response factor
SAL	screening action level
SCL	sample collection log
SMO	Sample Management Office
SOP	standard operating procedure
SOW	statement of work
SSL	soil screening level
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TA	technical area
TAL	target analyte list
TPH	total petroleum hydrocarbons
TPU	total propagated uncertainty
TSTA	Tritium Systems Test Assembly
UAL	upper acceptance limit
VOC	volatile organic compound
WCSF	waste characterization strategy form

A-2.0 METRIC CONVERSION TABLE

Multiply SI (Metric) Unit	by	To Obtain U.S. Customary Unit
kilometers (km)	0.622	miles (mi)
kilometers (km)	3281	feet (ft)
meters (m)	3.281	feet (ft)
meters (m)	39.37	inches (in.)
centimeters (cm)	0.03281	feet (ft)
centimeters (cm)	0.394	inches (in.)
millimeters (mm)	0.0394	inches (in.)
micrometers or microns (µm)	0.0000394	inches (in.)
square kilometers (km^2)	0.3861	square miles (mi^2)
hectares (ha)	2.5	acres
square meters (m^2)	10.764	square feet (ft^2)
cubic meters (m^3)	35.31	cubic feet (ft^3)
kilograms (kg)	2.2046	pounds (lb)
grams (g)	0.0353	ounces (oz)
grams per cubic centimeter (g/cm^3)	62.422	pounds per cubic foot (lb/ft^3)
milligrams per kilogram (mg/kg)	1	parts per million (ppm)
micrograms per gram (µg/g)	1	parts per million (ppm)
liters (L)	0.26	gallons (gal.)
milligrams per liter (mg/L)	1	parts per million (ppm)
degrees Celsius (°C)	9/5 + 32	degrees Fahrenheit (°F)

A-3.0 DATA QUALIFIER DEFINITIONS

Data Qualifier	Definition
U	The analyte was analyzed for but not detected.
J	The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.
J+	The analyte was positively identified, and the result is likely to be biased high.
J-	The analyte was positively identified, and the result is likely to be biased low.
UJ	The analyte was not positively identified in the sample, and the associated value is an estimate of the sample-specific detection or quantitation limit.
R	The data are rejected as a result of major problems with quality assurance/quality control (QA/QC) parameters.

Appendix B

Field Methods

B-1.0 INTRODUCTION

This appendix summarizes the field methods used during the 2010–2011 investigation of the DP Site Aggregate Area Delayed Sites and DP East building footprints at Technical Area 21 (TA-21) at Los Alamos National Laboratory (LANL or Laboratory). Table B-1.0-1 presents a summary of the methods used, and the following sections provide more detailed descriptions of the methods as well as deviations that occurred during execution of the work plan. All activities were conducted in accordance with approved subcontractor procedures that are technically equivalent to Laboratory standard operating procedures (SOPs) listed in Table B-1.0-2 and are available at http://www.lanl.gov/environment/all/qa/wes.shtml and http://www.lanl.gov/environment/all/qa/adep.shtml.

B-2.0 EXPLORATORY DRILLING CHARACTERIZATION

No exploratory drilling characterization was conducted during the 2011 investigation.

B-3.0 FIELD-SCREENING METHODS

This section summarizes the field-screening methods used during the investigation activities. Field screening for organic vapors was performed as necessary for health and safety purposes. Field screening for radioactivity was performed on every sample submitted to the Sample Management Office (SMO). Field-screening results for all investigation activities are described in section 4.2.2 and are presented in Table 4.2-2 of the investigation report.

B-3.1 Field Screening for Organic Vapors

Field screening for organic vapors was conducted for all samples at all locations outside of the former buildings, including Solid Waste Management Unit (SWMU) 21-011(b) and Consolidated Unit 21-004(b)-99. Screening was conducted using a MiniRAE 2000 photoionization detector (PID) equipped with an 11.7-electron volt lamp. Screening was performed in accordance with the manufacturer's specifications and SOP-06.33, Headspace Vapor Screening with a Photo Ionization Detector. Screening was performed on each sample collected, and screening measurements were recorded on the field sample collection logs (SCLs) and chain-of-custody (COC) forms, provided on DVD in Appendix C. The field-screening results are presented in Table 4.2-2 of the investigation report.

B-3.2 Field Screening for Radioactivity

All samples collected were field screened for radioactivity (targeting alpha and beta/gamma emitters) before they were submitted to the SMO. A Laboratory radiation control technician (RCT) conducted radiological screening using an HP 210 pancake probe, a Ludlum 2221 probe, an Eberline 50 cm^2 alpha probe, Spa 3 type sodium iodine probe, a Ludlum 2929 smear counter, and a low-volume air-sampler. Screening measurements were recorded on the SCLs and COC forms and are provided in Appendix C on DVD. The screening results are presented in Table 4.2-2 of the investigation report.

B-3.3 Radiological Survey

Alpha/beta, low-energy gamma, and high-energy gamma radiological surveys were conducted at SWMU 21-011(b) and Consolidated Unit 21-004(b)-99 to identify areas of elevated radiological activities, after structure removal. The surveys did not identify any areas of radiation significantly different from background. The results of the surveys did not change any predetermined sampling locations. Details of the radiological surveys and the results are presented in Appendix D.

B-4.0 FIELD INSTRUMENT CALIBRATION

All instruments were calibrated before use. All calibrations were performed according to the manufacturers' specifications and requirements.

B-5.0 SURFACE AND SUBSURFACE SAMPLING

This section summarizes the methods used to collect surface and subsurface samples, including soil and tuff samples, according to the approved investigation work plans (LANL 2009, 108166.9; LANL 2010, 110082.4; NMED 2010, 108443; NMED 2010, 110422).

B-5.1 Surface Sampling Methods

Surface samples were collected using either hand-auger or spade-and-scoop methods. Surface samples were collected in accordance with approved subcontractor procedures technically equivalent to SOP-06.10, Hand Auger and Thin-Wall Tube Sampler, or SOP-06.09, Spade and Scoop Method for the Collection of Soil Samples. A hand auger or spade and scoop were used to collect material in prescribed sampling increments. Samples for volatile organic compound (VOC) analysis were immediately transferred from the sample collection device to the sample container to minimize the loss of subsurface VOCs during the sample collection process. Containers for VOC samples were filled as completely as possible, leaving no or minimal headspace, and sealed with a Teflon-lined cap. The remaining sample material was placed in a stainless-steel bowl with a stainless-steel scoop, after which it was transferred to sterile sample collection jars or bags. Samples were preserved using coolers to maintain the required temperature and chemical preservatives, such as nitric acid, in accordance with an approved subcontractor procedure technically equivalent to SOP-5056, Sample Containers and Preservation.

Samples were appropriately labeled, sealed with custody seals, and documented before being transported to the SMO. Samples were managed according to approved subcontractor procedures technically equivalent to SOP-5057, Handling, Packaging, and Transporting Field Samples, and SOP-5058, Sample Control and Field Documentation.

Sample collection tools were decontaminated immediately before each sample was collected in accordance with a subcontractor procedure technically equivalent to SOP-5061, Field Decontamination of Equipment (see section B-5.7).

B-5.2 Borehole Logging

The required sampling depths at all locations were reached by hand augers or a power auger attachment. A drill rig with a hollow-stem auger was not used to collect subsurface samples. Therefore, there were no boreholes to log.

B-5.3 Subsurface Tuff Sampling Methods

Subsurface samples were collected in accordance with approved subcontractor procedures technically equivalent to SOP-06.10, Hand Auger and Thin-Wall Tube Sampler, or SOP-06.26, Core Barrel Sampling for Subsurface Earth Materials. Samples retrieved from the subsurface were field screened for radioactivity and visually inspected.

Samples for VOC analysis were immediately transferred from the sample collection device to the sample container to minimize the loss of subsurface VOCs during the sample collection process. Containers for VOC samples were filled as completely as possible, leaving no or minimal headspace, and sealed with a Teflon-lined cap.

Samples were placed in a stainless-steel bowl, and the material was crushed, if necessary, with a decontaminated rock hammer and stainless-steel spoon to allow the material to fit into the sample containers. The sample collection tools were decontaminated immediately before each sample was collected in accordance with an approved subcontractor procedure technically equivalent to SOP-5061, Field Decontamination of Equipment (see section B-5.7).

B-5.4 Quality Control Samples

Quality control (QC) samples were collected in accordance with an approved subcontractor procedure technically equivalent to SOP-5059, Field Quality Control Samples. The QC samples included field duplicates, field rinsate blanks, and field trip blanks. Field duplicate samples were collected from the same material as the regular investigation samples and submitted for the same analyses. Field duplicate samples were collected at a frequency of at least 1 duplicate sample for every 10 samples.

Field rinsate blanks were collected to evaluate the field decontamination procedures. Rinsate blanks were collected by rinsing sampling equipment (i.e., auger buckets and sampling bowls and spoons) after decontamination with deionized water. The rinsate water was collected in a sample container and submitted to the SMO. Field rinsate blank samples were analyzed for target analyte list metals and were collected from sampling equipment at a frequency of at least 1 rinsate sample for every 10 solid samples.

Field trip blanks were also collected at a frequency of one per day when samples were being collected for VOC analysis. Trip blanks consisted of containers of certified clean sand opened and kept with the other sample containers during the sampling process. Trip blanks were analyzed for VOCs only.

B-5.5 Sample Documentation and Handling

Field personnel completed an SCL and COC form for each sample. Sample containers were sealed with signed custody seals and placed in coolers at approximately 4°C. Samples were handled in accordance with approved subcontractor procedures technically equivalent to SOP-5057, Handling, Packaging, and Transporting Field Samples, and SOP-5056, Sample Containers and Preservation. Swipe samples were collected from the exterior of sample containers and analyzed by the RCT before the sample containers were removed from the site. Samples were transported to the SMO for processing and shipment to off-site contract analytical laboratories. The SMO personnel reviewed and approved the SCLs and COC forms and accepted custody of the samples. The SCLs and COC forms are provided in Appendix C (on DVD).

B-5.6 Borehole Abandonment

Motorized and regular hand-auger sampling locations deeper than 15 ft below ground surface (bgs) were abandoned in accordance with an approved subcontractor procedure technically equivalent to SOP-5034, Monitor Well and RFI Borehole Abandonment, by filling the boreholes with bentonite chips up to 2–3 ft from the ground surface. The chips were hydrated and clean soil was placed on top. All cuttings were managed as investigation-derived waste (IDW) as described in Appendix E.

B-5.7 Decontamination of Sampling Equipment

The hand auger barrels and all other sampling equipment that came (or could have come) in contact with sample material were decontaminated after each core was retrieved and logged. Decontamination included wiping the equipment with Fantastik and paper towels. Residual material adhering to equipment was removed using dry decontamination methods such as the use of wire brushes and scrapers. Decontamination activities were performed in accordance with an approved subcontractor procedure technically equivalent to SOP-5061, Field Decontamination of Equipment. Decontaminated equipment was surveyed by an RCT before it was released from the site. Field rinsate blank samples were collected in accordance with an approved procedure technically equivalent to SOP-5059, Field Quality Control Samples.

B-5.8 Site Demobilization and Restoration

Drilling equipment was not used during the 2010–2011 investigation. All temporary fencing and staging areas were dismantled and returned to preinvestigation conditions. All excavations were filled to match surrounding grade, to stabilize for erosion control, and to prevent off-site transport. At Consolidated Unit 21-004(b)-99 and SWMU 21-011(b), the excavations were backfilled to match surrounding site grade. The excavated areas were then seeded with native seed using hydromulch. For the footprints of the former DP East buildings, excavations were backfilled to the surrounding site grade. Base-course material was then applied to match the site condition of the area.

B-6.0 GEODETIC SURVEYING

Geodetic surveys of all sampling locations were performed using a Trimble RTK 5700 differential global-positioning system (DGPS) referenced from published and monumented external Laboratory survey control points in the vicinity. All sampling locations were surveyed in accordance with an approved subcontractor procedure technically equivalent to SOP-5028, Coordinating and Evaluating Geodetic Surveys. Horizontal accuracy of the monumented control points is within 0.1 ft. The DGPS instrument referenced from Laboratory control points is accurate within 0.2 ft. The surveyed coordinates are presented in Table 4.2-1 of the investigation report.

B-7.0 IDW STORAGE AND DISPOSAL

All IDW generated during the field investigation was managed in accordance with an approved subcontractor procedure technically equivalent to SOP-5238, Characterization and Management of Environmental Program Waste. This procedure incorporates the requirements of all applicable U.S. Environmental Protection Agency (EPA) and New Mexico Environment Department (NMED) regulations, U.S. Department of Energy orders, and Laboratory implementation requirements. IDW was also managed in accordance with the approved waste characterization strategy form. Details of IDW management are presented in Appendix E.

B-8.0 DEVIATIONS FROM THE WORK PLANS

Deviations from the approved investigation work plans (LANL 2009, 108166.9; NMED 2010, 108443; LANL 2010, 110082.4; NMED 2010, 110422) are summarized below.

Consolidated Unit 21-004(b)-99

- At locations 21-614322, 21-614324, 21-614325, and 21-614328, samples were collected from 0 to 1 ft rather than 0- to 0.5-ft depth to obtain adequate material for analyses.
- At location 21-614326, polychlorinated biphenyls (PCBs) were inadvertently ordered for analysis in the 5- to 6-ft depth interval.

SWMU 21-011(b)

- Because active systems in the vicinity of building 21-257 likely intersect the targeted acid waste line, a portion of the acid waste line was left in place. The acid waste line was removed up to the fence line of building 21-257. The portion of the acid waste line inside the fence surrounding building 21-257 was left in place. The remaining line will be removed and the proposed sampling locations (30-43) will be sampled when building operations have ceased or changed such that active building systems will not interfere with the removal of the line and sampling.
- A section of the acid waste line near building 21-257 was found under a cast-in-place concrete block poured to protect the acid waste line from the overlying active water line that crossed approximately 12 in. above the acid waste line. At the direction of the Laboratory’s subcontractor technical representative and in concurrence with the Laboratory’s site engineer, an approximately 8-ft section of the acid waste line beneath the concrete block was left in place and isolated with foam sealant. This did not prevent planned sample collection at the site.
- Sump structure 21-223, which extended at least 15 ft belowgrade, was demolished to below 10 ft belowgrade. The remaining lower portion of this cast-in-place sump was poured against competent tuff bedrock. Because of the sump’s location on a relatively steep sloping site area, the presence of active fire water lines on parts of two sides of the excavation, and a nearby power pole, the Laboratory’s site engineer determined that complete removal of the sump was impracticable; at the direction of the Laboratory’s subcontractor technical representative, it was left in place. The remaining portion of the sump was filled with bentonite and soil before the excavation was filled to grade with clean soil. This did not prevent planned sample collection at the site.
- The waste line extending from manhole 21-221 to 21-222 was left in place and partially grouted because of an active fire water line running parallel to, and several feet shallower than, the waste line. The Laboratory’s site engineer determined that attempts to excavate the waste line could lead the fire water line breaking and authorized the in-place grouting of the waste line. In attempting to insert plastic tubing to grout the acid waste line between manhole structure 21-221 and manhole structure 21-222, the waste line was found to be blocked. Plastic tubing was inserted into structure 21-221 and fed approximately 90 ft toward manhole structure 21-222. Approximately 150 gal. of grout was pumped into the industrial waste line, and the line was abandoned. This did not prevent planned sample collection at the site.
- A section of waste line connecting manhole 21-221 to former building 21-209 was encountered during the investigation. This portion of the line was left in place and grouted because it was deeper than 10 ft bgs. This did not prevent planned sample collection at the site.

- An approximately 50-ft section of line from former cooling tower 21-420 to former cooling tower 21-220 (LANL 2009, 108166.9, Figure 2.2-1) was abandoned in place because an active water line was above the cooling system piping. This did not prevent planned sample collection at the site.
- The base of structure 21-223 and manhole structure 21-222 were left in place because they were deeper than 10 ft bgs and were formed in place in excavations into competent Qbt 3 bedrock, making excavation impracticable.
- North of former building 21-155, the southwest piping connecting to manhole structure 21-222 could not be found within approximately 10 ft bgs. Therefore, proposed sampling location 7 (LANL 2009, 108166.9, Figure 4.1-1) was not sampled.
- An approximately 50-ft section of the line on the west side of former building 21-155 was abandoned in place because it was encased in 2 ft of concrete foundation left in place by the decontamination and decommissioning operations. Samples could not be collected at proposed sampling locations 4 and 5 (LANL 2009, 108166.9, Figure 4.1-1).
- Samples from locations 21-613828 and 21-613829 were inadvertently not analyzed for isotopic thorium. However, this does not affect the results because a total of 354 samples were analyzed for isotopic thorium at the sites investigated, with all detections at or below background levels. Therefore, it is unlikely that isotopic thorium would be detected above background at these two locations.

Former Building 21-152

- The sample collected at 8 to 9 ft bgs from location 21-614204 was inadvertently not analyzed for technetium-99. However, this does not affect the results because a total of 341 samples were analyzed for technetium-99 at the sites, with no detections. Therefore, it is unlikely that technetium-99 would be detected at this one location.
- When the vacuum waste line that extended along the east side of former building 21-152 was removed, a deeper waste line running parallel and passing southward under building 21-166 was also was excavated and removed. This waste line, associated with SWMU 21-024(k) and the DP Site Aggregate Area work plan (LANL 2008, 104989), had been left in place for later excavation once the DP East buildings had been removed. Sampling for the vacuum line is sufficient to evaluate the nature and extent of this waste line. It should be noted that a portion of this waste line, which extends under the active south side site access road, remains in place.
- The sample collected at the 5- to 6-ft-depth interval at location 21-614222 was inadvertently analyzed for total petroleum hydrocarbon–diesel range organics by the analytical laboratory.

Former Building 21-155

- Sampling locations 21-613977 and 21-613978 were moved approximately 5 ft west and 5 ft east, respectively, of a water line (LANL 2010, 110082.4, Figure 2.2-1).
- Location 21-614015 (LANL 2010, 110082.4, Figure 2.2-1) was moved 8 ft east of planned sampling location 39 because of the presence of concrete.
- Location 21-614001 (LANL 2010, 110082.4, Figure 2.2-1) was moved 5 ft northwest of planned sampling location 17 because of auger refusal.

Former Building 21-209

- Only one depth was sampled at location 21-612268 (LANL 2010, 110082.4, Figure 2.3-1) because of auger refusal. In addition, the sample collected was not analyzed for radionuclides because the sample size was small. This did not adversely affect the results. The results from samples collected the other floor drains in the area indicate that additional sampling is not necessary at this location.
- Two floor drains were found after all equipment had been removed from the basement. Locations 21-612265 and 21-613173 were added to sample the floor drains.
- The basement was left in place and filled with clean fill and demolition debris. Therefore, the floor drain piping in the basement was not removed. This did not prevent planned sample collection at the site.

B-9.0 REFERENCES

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

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

LANL (Los Alamos National Laboratory), December 2008. "Delta Prime Site Aggregate Area Phase II Work Plan, Revision 1," Los Alamos National Laboratory document LA-UR-08-7794, Los Alamos, New Mexico. (LANL 2008, 104989)

LANL (Los Alamos National Laboratory), December 2009. "Investigation Work Plan for Delta Prime Site Aggregate Area Delayed Sites, Revision 1," Los Alamos National Laboratory document LA-UR-09-8180, Los Alamos, New Mexico. (LANL 2009, 108166.9)

LANL (Los Alamos National Laboratory), July 2010. "Delta Prime East Building Footprints Letter Work Plan, Revision 1," Los Alamos National Laboratory document LA-UR-10-4812, Los Alamos, New Mexico. (LANL 2010, 110082.4)

NMED (New Mexico Environment Department), January 11, 2010. "Approval, Investigation Work Plan for Delta Prime Site Aggregate Area Delayed Sites at Technical Area 21," New Mexico Environment Department letter to G.J. Rael (DOE-LASO) and M.J. Graham (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2010, 108443)

NMED (New Mexico Environment Department), July 26, 2010. "Approval, Delta Prime East Building Footprints Letter Work Plan for Delta Prime Site Aggregate Area, Technical Area 21," New Mexico Environment Department letter to G.J. Rael (DOE-LASO) and M.J. Graham (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2010, 110422)

Table B-1.0-1
Summary of Field Investigation Methods

Method	Summary
Spade and Scoop Collection of Soil Samples	This method was used to collect shallow (i.e., approximately 0-12 in.) soil or sediment samples. The spade-and-scoop method involved digging a hole to the desired depth, as prescribed in the approved work plan, and collecting a discrete grab sample. Each sample was placed in a clean stainless-steel bowl for transfer into various sample containers. Samples for VOC analysis were transferred immediately into sample containers. Containers for VOC analysis were immediately transferred from the sample collection device to the sample containers and sealed with Teflon-lined caps. Remaining sample material was placed in a clean stainless-steel bowl for transfer into various sample containers. The remaining sample material was transferred from the auger bucket to a stainless-steel sampling bowl before the other required sample containers were filled.
Hand Auger Sampling	This method is typically used for sampling soil or sediment at depths of less than 10–15 ft, but in some cases may be used to collect samples of weathered or nonwelded tuff. The method involves hand-turning a stainless-steel bucket auger (typically 3–4 in. inside diameter [I.D.]), creating a vertical hole that can be advanced to the desired sampling depth. When the desired depth was reached, the auger was decontaminated before advancing the hole through the sampling depth. Samples for VOC analysis were transferred immediately into sample containers. Containers for VOC analysis were immediately transferred from the sample collection device to the sample containers and sealed with Teflon-lined caps. Remaining sample material was placed in a clean stainless-steel bowl for transfer into various sample containers. The remaining sample material was transferred from the auger bucket to a stainless-steel sampling bowl before the other required sample containers were filled.
Handling, Packaging, and Shipping of Samples	Field team members sealed and labeled samples before packing to ensure the sample and the transport containers were free of external contamination. Field team members packaged all samples to minimize the possibility of breakage during transport. After all environmental samples were collected, packaged, and preserved, a field team member transported them to the SMO. The SMO arranged to ship the samples to the analytical laboratories.
Sample Control and Field Documentation	The collection, screening, and transport of samples were documented on standard forms generated by the SMO. These included SCLs, COC forms, and sample container labels. SCLs were completed at the time of sample collection, and the logs were signed by the sampler and a reviewer who verified the logs for completeness and accuracy. Corresponding labels were initialed and applied to each sample container, and custody seals were placed around each sample container. COC forms were completed and signed to verify that the samples were not left unattended.
Field Quality Control Samples	Field QC samples were collected as follows: *Field Duplicates*: At a frequency of 10%; collected at the same time as a regular sample and submitted for the same analyses *Equipment Rinsate Blank*: At a frequency of 10%; collected by rinsing sampling equipment with deionized water, which was 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 blank containers of certified clean sand were opened and kept with the other sample containers during the sampling process
Field Decontamination of Sampling Equipment	Dry decontamination was used to minimize the generation of liquid waste. Dry decontamination included the use of a wire brush or other tool to remove soil or other material adhering to the sampling equipment, followed by use of a commercial cleaning agent (nonacid, waxless cleaners) and paper wipes.

Table B-1.0-1 (continued)

Method	Summary
Containers and Preservation of Samples	Specific requirements/processes for sample containers, preservation techniques, and holding times are based on EPA guidance for environmental sampling, preservation, and quality assurance. Specific requirements for each sample were printed on the SCL provided by the SMO (size and type of container [e.g., glass, amber glass, or polyethylene]). All samples were preserved by placing them in insulated containers with ice to maintain a temperature of 4°C.
Coordinating and Evaluating Geodetic Surveys	Geodetic surveys focused on obtaining survey data of acceptable quality to use during project investigations. Geodetic surveys were conducted with a Trimble 5700 DGPS. The survey data conformed to Laboratory Information Architecture project standards IA-CB02, GIS Spatial Reference System, and IA-D802, Geospatial Positioning Accuracy Standards for A/E/C/ and Facility Management. All coordinates were expressed as State Plane Coordinate System 83, NM Central, U.S. feet. All elevation data were reported relative to the National Geodetic Vertical Datum of 1983.
Management of Environmental Restoration Project Waste, Waste Characterization	IDW was managed, characterized, and stored in accordance with an approved waste characterization strategy form that documents site history, field activities, and characterization approach for each waste stream managed. During the investigation, waste characterization complied with on- or off-site waste acceptance criteria. All stored IDW was marked with appropriate signage and labels. Drummed IDW was stored on pallets to prevent deterioration of containers. A waste storage area was established before waste was generated. Waste storage areas located in controlled areas of the Laboratory were monitored as needed to prevent inadvertent addition or management of wastes by unauthorized personnel. Each container of waste generated was individually labeled with waste classification, item identification number, and radioactivity (if applicable) immediately following containerization. All waste was segregated by classification and compatibility to prevent cross-contamination. Management of IDW is described in Appendix E.

Table B-1.0-2
SOPs Used for Investigation Activities Conducted at DP Site Aggregate Area Delayed Sites and DP East Building Footprints

SOP-5018, Integrated Fieldwork Planning and Authorization
SOP-5028, Coordinating and Evaluating Geodetic Surveys
SOP-5034, Monitor Well and RFI Borehole Abandonment
SOP-5238, Characterization and Management of Environmental Program Waste
SOP-5055, General Instructions for Field Investigations
SOP-5056, Sample Containers and Preservation
SOP-5057, Handling, Packaging, and Transporting Field Samples
WES-EDA-QP-219, Sample Control and Field Documentation
SOP-5059, Field Quality Control Samples
SOP-5061, Field Decontamination of Equipment
SOP-5181, Notebook and Logbook Documentation for Environmental Directorate Technical and Field Activities
SOP-01.12, Field Site Closeout Checklist
SOP-06.09, Spade and Scoop Method for Collection of Soil Samples
SOP-06.10, Hand Auger and Thin-Wall Tube Sampler
SOP-06.26, Core Barrel Sampling for Subsurface Earth Materials
SOP-06.33, Headspace Vapor Screening with a Photo Ionization Detector

Note: Procedures used were approved subcontractor procedures technically equivalent to the procedures listed.

Appendix C

Analytical Suites and Results and Analytical Reports
(on DVD included with this document)

Appendix D

Radiological Surveys

Los Alamos Technical Associates, Inc.

999 Central Ave., Suite 300 / Los Alamos, NM 87544 / Telephone (505) 662-9080 / FAX (505) 662-1757

April 5, 2011

Mr. Mark Thacker
Los Alamos National Security
Los Alamos National Laboratory
P. O. Box 1663, MS C349
Los Alamos, NM 87545
Transmitted via email: mthacker@lanl.gov

SUBJECT: 78450-002-11, Radiological Survey Report for 21-011(b)

Dear Mr. Thacker:

Los Alamos Technical Associates (LATA) is pleased to submit the subject report. ERG conducted the onsite effort March 16-17, 2011.

If you have any questions, please contact me at 662-1816 or Joe Sena, our Field Operations Manager at 662-1837.

Sincerely,

Felicia M. Aguilar

Felicia M. Aguilar
Project Manager

Cy: F. Stafford, via email
M. Thacker, via email
B. Wedgeworth, via email
J. Byers, via email
J. Sena, via email
J. Lockhart, via email

Radiological Survey of SWMU 21-011(B) Pipe Trench at the Los Alamos National Laboratory

Prepared for:

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March, 2011

Radiological Survey of SWMU 21-011(b) Pipe Trench

1.0 Introduction

Los Alamos Technical Associates (LATA) retained Environmental Restoration Group, Inc. (ERG) to conduct a static alpha-beta surface survey and GPS-based gamma radiological survey of an excavated waste line pipe trench at Los Alamos National Laboratory (LANL) Technical Area 21 (TA-21) Solid Waste Management Unit (SWMU) 21-011(b). The trench excavation was approximately 720 feet in length and surveys were performed over a two day period, March 16, 2011 and March 17, 2011.

SWMU 21-011(b) is a former acid waste sump. From the sump, a 3-inch line transported waste to a treatment plant. Possible radiological constituents released from the pipe into the surrounding soil include Pu-239, Am-241, Sr-90, Cs-137, and H-3. Because of this an alpha/beta survey, low-energy gamma, and a high-energy gamma survey were performed.

2.0 Method

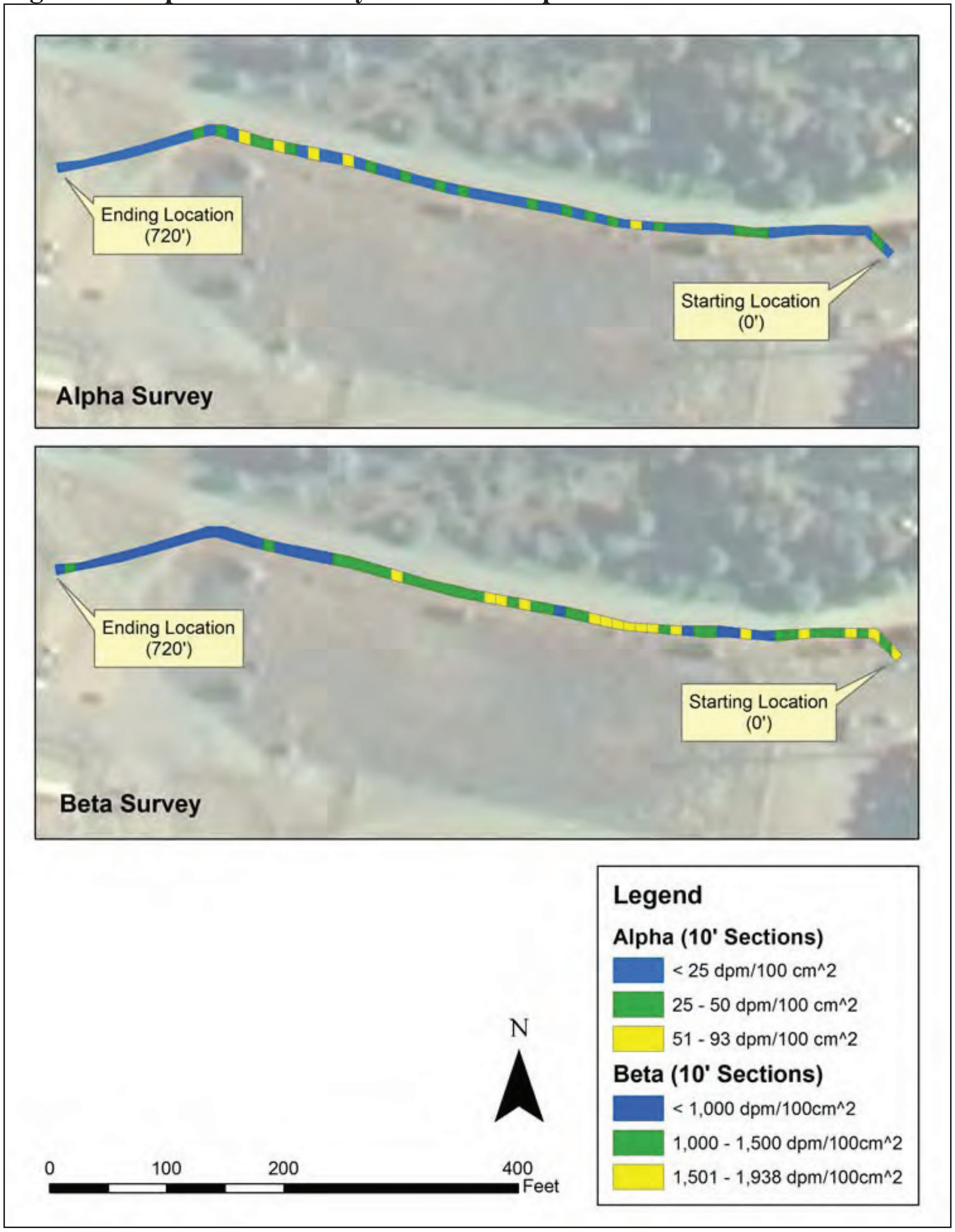
For the alpha/beta survey a static one-minute alpha/beta scaler measurement was made on the floor of the trench, at ten-foot intervals for the entire trench length. Measurements were performed using matched Ludlum Model 43-93 alpha/beta Phoswhich detectors coupled to Ludlum Model 2360 dual-channel scalers. Approximately 10-percent of the trench was inaccessible to personnel due to the trench depth. For this area one of the instrument sets was recalibrated using a longer 12-foot long cable. The detector was then mounted onto a pole allowing the surveyor to safely stand outside of the trench and survey the trench bottom.

The gamma surveys were performed using a Ludlum Model 2221 ratemeter/scaler with appropriate detector, coupled to a Trimble Pro XRS mapping grade GPS. The Ludlum Model 2221 and GPS unit were both carried in a backpack with the Model 2221 operated in ratemeter mode, allowing for each gamma count rate and associated coordinates to be recorded every one second. For the low-energy photon survey, an Alpha Spectra 5-inch diameter FIDLER detector was used, and maintained approximately 6-inches above the trench floor. For the high-energy gamma survey, a Ludlum Model 44-10 2-inch by 2-inch sodium iodide (NaI) detector was used, and maintained approximately 18-inches above the trench floor. The scanning speed for both surveys was approximately 1.0 ft/sec. Approximately 10% of the trench was inaccessible by field personnel due to the trench depth. For this area the gamma detectors were suspended from a pole down the trench allowing for the survey to be conducted in the same manner and height above trench bottom as the accessible areas of the trench. At the end of the survey, the data were downloaded into a laptop computer and processed using a combination of Trimble Pathfinder Office and ESRI ArcGIS computer applications.

3.0 Results

Data for the alpha/beta survey were converted to disintegrations per minute per 100 cm^2 (dpm/100cm^2) using the average individual detector efficiencies and average reference background readings for each detector. These data are presented below in Figure 3.1. The figure represents the alpha and beta levels in 10-foot long increments for the length of the trench, with varying colors depicting the total activity rage for the survey. No readings exceeded 100 dpm/100 cm^2 for alpha, or 2,000 dpm/100 cm^2 for beta. The alpha/beta survey data log sheets are located in Appendix A.

Figure 3.1 Alpha/Beta Survey of 21-011B Pipe Trench



The alpha/beta detector survey data statistics are shown below in Table 3.1.

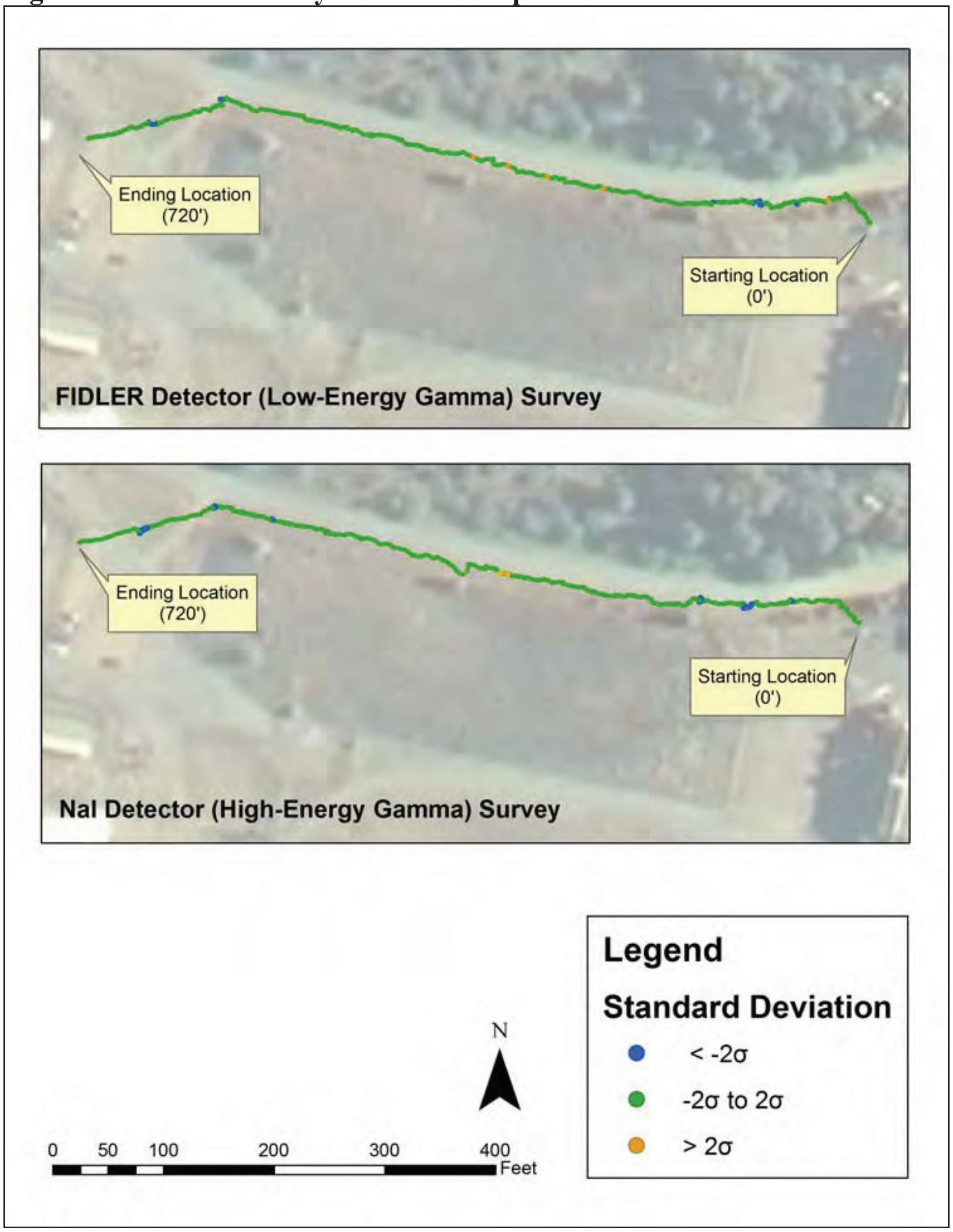
Table 3.1 Alpha/Beta Detector Survey Results

Channel	Readings	Mean (dpm/100cm^2)	Standard Deviation (dpm/100cm^2)	Maximum Reading (dpm/100cm^2)	Minimum Reading (dpm/100cm^2)
Alpha	73	17.9	19.6	93.4	0
Beta	73	1,130	447	1,938	304

3.2 Gamma Surveys

Data for the FIDLER detector (low-energy) and NaI detector (high-energy) gamma surveys are presented below in Figure 3.2. The data within each figure are presented with varying colors depicting the gamma count-rate range for each survey.

Figure 3.3 Gamma Surveys of 21-011B Pipe Trench



Due to the geometry of the trench (floor plus two close sidewalls), readings taken inside the trench would be non-representative of any reference reading taken outside the trench. Because of this, the determination of elevated readings is based on the expected statistical spread of the data.

Gamma radiation detection from a single source is a random process that will result in a Poisson probability distribution of count rates, with the larger percentage of the count rates clustered around the mean and only a small percentage within the tails of the distribution above and below the mean. Highly elevated readings from sources other than background are typically identifiable by a distribution that is heavily weighted on the right side or that contains a sample that falls outside the typical spread from background radiation. Distribution of the low-energy FIDLER detector and high-energy NaI detector data are presented below in Figures 3.3 and 3.4, respectively. Both figures show the data fit the expected Poisson distributions with no right side tail outliers. The data also indicate approximately two distributions, most likely due to a difference in soil and/or rock composition (rhyolitic tuff versus loamy soil) throughout the trench, and/or a change of detector geometry throughout the trench. The distributions for both surveys are similar.

Figure 3.2 Low-energy FIDLER Detector Data Distribution

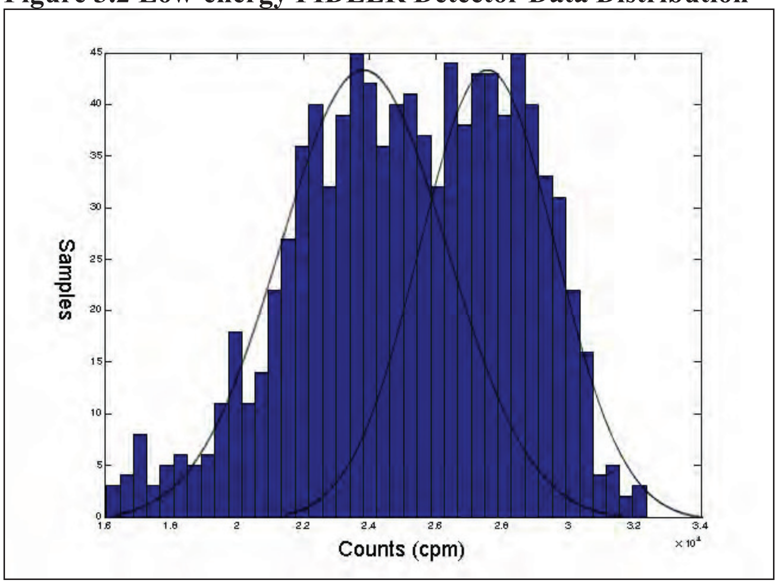
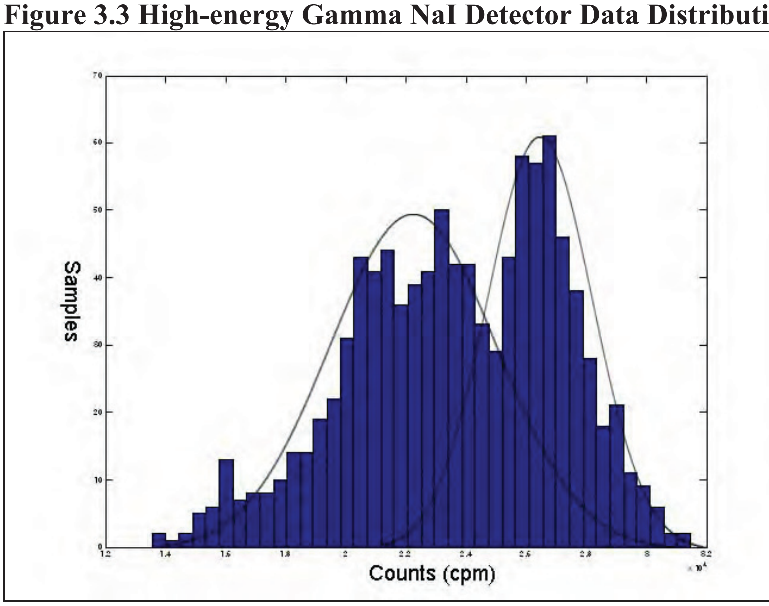


Figure 3.3 High-energy Gamma NaI Detector Data Distribution



The survey data statistics for the FIDLER detector and NaI detector are shown below in Table 3.2. The distribution of data indicates no highly-elevated values with respect to the mean trench readings for either detector data set.

Table 3.2 Gamma Detector Survey Results

Detector	Readings	Mean (cpm)	Standard Deviation	Maximum Reading (cpm)	Minimum Reading (cpm)
FIDLER (low-energy)	971	25,219	3,252	32,371	16,051
NaI 44-10 (high-energy)	1,002	23,713	3,454	31,471	13,553

4.0 Quality Control

All radiological instrumentation was calibrated within six months prior to use using NIST traceable sources and pulser. Field instruments were function checked before and after use each day. Function check forms and calibration sheets are included in Appendix B.

Appendix A

Alpha/Beta Static Measurements Forms

ERG

Total Contamination Survey Form - Dual Channel

Facility/Site: 21-011B	Date/Time: 3/16/11	Technician: Tyler Aleeksen	
Ratemeter: Ludlum 2360	Serial No.: 215292	Cal. Due Date: 3/14/12	
Detector: Ludlum 43-93	Serial No.: PR199836	Cal. Due Date: 3/14/12	
Alpha Threshold (mV): 120	Beta Threshold (mV): 4	Beta Window (mV): 30	HV: 700
Alpha Efficiency: 0.207	Beta Efficiency: 0.143	Probe Window Area (cm^2): 100	Battery: ok

Comments: ______________________________

Item Surveyed	Count Time (minutes)	Gross Counts		Background Counts (10 min)		Net Counts		Contamination Level (dpm/100 cm^2)		Meets Release Criteria? (yes/no)	Swipe Necessary? (yes/no)
		Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta		
0'	1	7	638	52	4178	1.8	220.2	8.7	1539.9	N/A	N/A
20'		4	695			0	277.2	0	1938.5		
40'		6	653			0.8	235.2	3.9	1644.8		
60'		6	585			0.8	167.2	3.9	1169.2		
80'		4	659			0	241.2	0	1687		
100'		5	574			0	156.2	0	1092.3		
130'		11	673			5.8	255.2	28	1785		
150'		5	508			0	90.2	0	631		
170'		4	620			0	202.2	0	1414		
190'		9	692			3.8	274.2	18.4	1918		

Form Completed By: ______________ Date: 3/18/11

Reviewed By: ______________ Date: 3/22/11

ERG Form 2.16A

ERG

Total Contamination Survey Form - Dual Channel

Facility/Site: 21-011B	Date/Time: 3/16/11	Technician: Tyler Aleeksen	
Ratemeter: Ludlum 2360	Serial No.: 215292	Cal. Due Date: 3/14/12	
Detector: Ludlum 43-93	Serial No.: PR199836	Cal. Due Date: 3/14/12	
Alpha Threshold (mV): 120	Beta Threshold (mV): 4	Beta Window (mV): 30	HV: 700
Alpha Efficiency: 0.207	Beta Efficiency: 0.143	Probe Window Area (cm^2): 100	Battery: ok

Comments:

Item Surveyed	Count Time (minutes)	Gross Counts		Background Counts (10 min)		Net Counts		Contamination Level (dpm/100 cm^2)		Meets Release Criteria? (yes/no)	Swipe Necessary? (yes/no)
		Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta		
210'	1	10	667	52	4178	4.8	249.2	23.2	1743	N/A	N/A
230'		5	646			0	228.2	0	1596		
250'		4	655			0	237.2	0	1659		
270'		5	631			0	213.2	0	1491		
290'		7	560			1.8	142.2	8.7	994.4		
310'		11	629			5.8	211.2	28	1477		
330'		4	632			0	214.2	0	1498		
350'		2	646			0	228.2	0	1596		
370'		15	616			9.8	198.2	47.3	1386		
390'		11	576			5.8	158.2	28	1106.3		

Form Completed By: [signature] Date: 3/18/11

Reviewed By: [signature] Date: 3/22/11

ERG Form 2.16A

ERG

Total Contamination Survey Form - Dual Channel

Facility/Site: 21-011B	Date/Time: 3/16/11	Technician: Tyler Aleeksen	
Ratemeter: Ludlum 2360	Serial No.: 215292	Cal. Due Date: 3/14/12	
Detector: Ludlum 43-93	Serial No.: PR199836	Cal. Due Date: 3/14/12	
Alpha Threshold (mV): 120	Beta Threshold (mV): 4	Beta Window (mV): 30	HV: 700
Alpha Efficiency: 0.207	Beta Efficiency: 0.143	Probe Window Area (cm^2): 100	Battery: ok

Comments:

Item Surveyed	Count Time (minutes)	Gross Counts		Background Counts (10 min)		Net Counts		Contamination Level (dpm/100 cm^2)		Meets Release Criteria? (yes/no)	Swipe Necessary? (yes/no)
		Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta		
410'	1	7	621	52	4178	1.8	203.2	8.7	1421	N/A	N/A
430'		3	656			0	238.2	0	1666		
450'		14	619			8.8	201.2	42.5	1407		
470'		17	578			11.8	160.2	57	1120.3		
490'		9	493			3.8	75.2	18.4	526		
510'		5	538			0	120.2	0	840.6		
530'		16	520			10.8	102.2	52.2	715		
550'		12	536			6.8	118.2	32.9	826.6		
570'		7	551			1.8	133.2	8.7	931.5		
590'		7	520			1.8	102.2	8.7	715		

Form Completed By: [signature] Date: 3/18/11

Reviewed By: [signature] Date: 3/22/11

ERG Form 2.16A

ERG

Total Contamination Survey Form - Dual Channel

Facility/Site: 21-011 B	Date/Time: 3/16/11	Technician: Matt Simonds	
Ratemeter: Ludlum 2360	Serial No.: 145462	Cal. Due Date: 3/14/12	
Detector: Ludlum 43-93	Serial No.: PR299679	Cal. Due Date: 3/14/12	
Alpha Threshold (mV): 120	Beta Threshold (mV): 4	Beta Window (mV): 30	HV: 700
Alpha Efficiency: 0.198	Beta Efficiency: 0.145	Probe Window Area (cm^2): 100	Battery: ok

Comments:

Item Surveyed	Count Time (minutes)	Gross Counts		Background Counts (10 min)		Net Counts		Contamination Level (dpm/100 cm^2)		Meets Release Criteria? (yes/no)	Swipe Necessary? (yes/no)
		Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta		
10'	1	8	637	25	4482	5.5	188.8	27.8	1302	N/A	N/A
30'		7	606			4.5	157.8	22.7	1088		
50'		6	658			3.5	209.8	17.7	1447		
70'		3	662			0.5	213.8	2.5	1475		
90'		7	638			4.5	189.8	22.7	1309		
110'		10	534			7.5	85.8	37.9	591.7		
120'		8	586			5.5	137.8	27.8	950.3		
140'		7	575			4.5	126.8	22.7	874.5		
160'		5	660			2.5	211.8	12.6	1461		
180'		5	592			2.5	143.8	12.6	992		

Form Completed By: [signature] Date: 3/18/11

Reviewed By: [signature] Date: 3/22/11

ERG Form 2.16A

ERG

Total Contamination Survey Form - Dual Channel

Facility/Site: 21-011 B	Date/Time: 3/16/11	Technician: Matt Simonds	
Ratemeter: Ludlum 2360	Serial No.: 145462	Cal. Due Date: 3/14/12	
Detector: Ludlum 43-93	Serial No.: PR299679	Cal. Due Date: 3/14/12	
Alpha Threshold (mV): 120	Beta Threshold (mV): 4	Beta Window (mV): 30	HV: 700
Alpha Efficiency: 0.198	Beta Efficiency: 0.145	Probe Window Area (cm^2): 100	Battery: ok

Comments: ______

Item Surveyed	Count Time (minutes)	Gross Counts		Background Counts (10 min)		Net Counts		Contamination Level (dpm/100 cm^2)		Meets Release Criteria? (yes/no)	Swipe Necessary? (yes/no)
		Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta		
200'	1	10	611	25	4482	7.5	162.8	37.9	1122.8	N/A	N/A
220'		13	716			10.5	267.8	53	1847		
240'		12	719			9.5	270.8	48	1867.6		
260'		9	675			6.5	226.8	32.8	1564		
280'		8	615			5.5	166.8	27.8	1150.3		
300'		4	623			1.5	174.8	7.6	1205.5		
320'		1	699			0	250.8	0	1729.7		
340'		4	700			1.5	251.8	7.6	1736.6		
360'		5	614			2.5	165.8	12.6	1143.4		
380'		5	624			2.5	175.8	12.6	1212.4		

Form Completed By: [signature] Date: 3/18/11

Reviewed By: Kenneth R Bohn Date: 3/22/11

ERG Form 2.16A

ERG

Total Contamination Survey Form - Dual Channel

Facility/Site: 21 - 011 B	Date/Time: 3/16/11	Technician: Matt Simonds	
Ratemeter: Ludlum 2360	Serial No.: 145462	Cal. Due Date: 3/14/12	
Detector: Ludlum 43-93	Serial No.: PR299679	Cal. Due Date: 3/14/12	
Alpha Threshold (mV): 120	Beta Threshold (mV): 4	Beta Window (mV): 30	HV: 700
Alpha Efficiency: 0.198	Beta Efficiency: 0.145	Probe Window Area (cm^2): 100	Battery: ok

Comments:

Item Surveyed	Count Time (minutes)	Gross Counts		Background Counts (10 min)		Net Counts		Contamination Level (dpm/100 cm^2)		Meets Release Criteria? (yes/no)	Swipe Necessary? (yes/no)
		Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta		
400'	1	3	658	25	4482	0.5	209.8	2.5	1447	N/A	N/A
420'		8	617			5.5	168.8	27.8	1164.1		
440'		6	609			3.5	160.8	17.7	1109		
460'		3	625			0.5	176.8	2.5	1219.3		
480'		7	595			4.5	146.8	22.7	1012.4		
500'		17	556			14.5	107.8	73.2	743.4		
520'		10	522			7.5	73.8	37.9	509		
540'		10	613			7.5	164.8	37.9	1336.6		
560'		21	530			18.5	81.8	93.4	564.1		
580'		11	516			8.5	67.8	42.9	467.6		

Form Completed By: [signature] Date: 3/18/11

Reviewed By: [signature] Date: 3/22/11

ERG

Total Contamination Survey Form - Dual Channel

Facility/Site: 21-011 B	Date/Time: 3/16/11	Technician: Matt Simonds	
Ratemeter: Ludlum 2360	Serial No.: 145462	Cal. Due Date: 3/14/12	
Detector: Ludlum 43-93	Serial No.: PR299679	Cal. Due Date: 3/14/12	
Alpha Threshold (mV): 120	Beta Threshold (mV): 4	Beta Window (mV): 30	HV: 700
Alpha Efficiency: 0.198	Beta Efficiency: 0.145	Probe Window Area (cm^2): 100	Battery: ok

Comments:

Item Surveyed	Count Time (minutes)	Gross Counts		Background Counts (10 min)		Net Counts		Contamination Level (dpm/100 cm^2)		Meets Release Criteria? (yes/no)	Swipe Necessary? (yes/no)
		Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta		
600'	1	11	535	75	4482	8.5	86.8	42.9	598.6	N/A	N/A

Form Completed By: [illegible] Date: 3/18/11

Reviewed By: [illegible] Date: 3/22/11

ERG

Total Contamination Survey Form - Dual Channel

Facility/Site: 21 - 011B	Date/Time: 3/17/11	Technician: Tyler Alecksen	
Ratemeter: Ludlum 2360	Serial No.: 145462	Cal. Due Date: 3/14/12	
Detector: Ludlum 43-93	Serial No.: PR299679	Cal. Due Date: 3/14/12	
Alpha Threshold (mV): 120	Beta Threshold (mV): 4	Beta Window (mV): 30	HV: 900
Alpha Efficiency: 0.192	Beta Efficiency: 0.143	Probe Window Area (cm^2): 100	Battery: oK

Comments:

Item Surveyed	Count Time (minutes)	Gross Counts		Background Counts (10 min)		Net Counts		Contamination Level (dpm/100 cm^2)		Meets Release Criteria? (yes/no)	Swipe Necessary? (yes/no)
		Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta		
610'	1	2	580	39	5045	0	75.5	0	528	N/A	N/A
620'		6	553			2.1	48.5	10.9	339.2		
630'		3	551			0	46.5	0	325.2		
640'		4	610			0.1	105.5	0.5	737.8		
650'		5	560			1.1	55.5	5.7	398		
660'		3	548			0	43.5	0	304.2		
670'		5	552			1.1	51.5	5.7	360		
680'		3	596			0	91.5	0	639.9		
690'		2	616			0	111.5	0	779.7		
700'		2	630			0	125.5	0	877.6		

Form Completed By: [signature] Date: 3/18/11

Reviewed By: [signature] Date: 3/22/11

ERG

Total Contamination Survey Form - Dual Channel

Facility/Site: 21-011B	Date/Time: 3/17/11	Technician: Tyler Aleckson	
Ratemeter: Ludlum 2360	Serial No.: 145462	Cal. Due Date: 3/14/12	
Detector: Ludlum 43-93	Serial No.: PR299679	Cal. Due Date: 3/14/12	
Alpha Threshold (mV): 120	Beta Threshold (mV): 4	Beta Window (mV): 30	HV: 900
Alpha Efficiency: 0.192	Beta Efficiency: 0.143	Probe Window Area (cm^2): 100	Battery: ok

Comments: ______

Item Surveyed	Count Time (minutes)	Gross Counts		Background Counts (10 min)		Net Counts		Contamination Level (dpm/100 cm^2)		Meets Release Criteria? (yes/no)	Swipe Necessary? (yes/no)
		Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta		
710'	1	6	655	39	5045	2.1	150.5	11	1052.5	N/A	N/A
720'	↓	1	586	↓	↓	0	81.5	0	570	↓	↓

Form Completed By: [signature] Date: 3/18/11

Reviewed By: [signature] Date: 3/22/11

ERG Form 2.16A

Appendix B

Calibration and Daily Function Check Forms

ERG

Function Check Form
Single Channel Detector

Ratemeter: LUDLUM 2221 Serial No. 262328 Cal. Due Date: 3/14/12

Detector: ALPHA SPECTRA FIDLER Serial No. 010807 F Cal. Due Date: 3/16/12

Source: Am-241 Activity: 1 μCi Serial No. SMOKE DETECTOR ERG-1

Comments: 14-FOOT CABLE USED.

Date	Time	Battery	High Voltage	Threshold	Gross Counts	Background	Net Counts	Efficiency	Initial
3/~~17~~ 17/11	08:40	5.4	1150	101	191015	10844	180171	—	CF
3/17/11	1640	5.3	1147	101	192192	11432	180760	–	TA

Reviewed By: [signature] Date: 3/22/11

ERG Form 1.30A

#2

ERG

Function Check Form
Dual Channel Detector

Ratemeter: LUDLUM 2360 | Serial No. 145462 | Cal. Due Date: 3/14/12

Detector: LUDLUM 4393 | Serial No. PR299679 | Cal. Due Date: 3/14/12

Alpha Threshold: 120 mV | Beta Threshold: 4 mV | Beta Window: 30 mV

Alpha Source: TH-230 | Activity: 21,300 DPM (3/28/05) | Serial No. 5447-05

Beta Source: Tc-99 | Activity: 21,700 DPM (6/27/02) | Serial No. 4004-02

Comments: CABLE LENGTH ON 3/16/11 WAS 39".

CABLE CHANGED TO 12' ON 3/17/11.

| * 10-MINUTE COUNTS * ⟶ | %

	Date	Time	High Voltage	Battery	Alpha		Beta		Background		Efficiency		Initial
					Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	
LATA office	3/16/11	08:50	700	✓	42534	5942	311	35151	3	2351	20.0	15%	CF
ERG office	3/16/11	18:00	700	✓	41609	6213	50	32678	37	2356	19.5	14.0	CF
ERG office	3/17/11	0955	800	✓	38564	8526	364	31982	28	2462	18.6	13.6	TA
	3/17/11	1630	800	✓	42255	7983	173	35047	15	2414	19.8	15.0	TA
											α	β	
							*	3/16	AVG EFFICIENCY:		19.8	14.5	
							*	3/17	"		19.2	14.3	

Reviewed By: [signature] Date: 3/22/11

ERG Form 1.30B

#1

ERG

Function Check Form
Dual Channel Detector

Ratemeter: LUDLUM 2360 Serial No. 215292 Cal. Due Date: 3/14/12

Detector: LUDLUM 43-93 Serial No. PR199836 Cal. Due Date: 3/14/12

Alpha Threshold: 120 mV Beta Threshold: 4 mV Beta Window: 30 mV

Alpha Source: TH-230 Activity: 21,300 DPM (3/28/05) Serial No. 5447-05

Beta Source: TC-99 Activity: 21,700 DPM (6/27/02) Serial No. 4004-02

Comments: Cable changed to 12' on 3/17/11

Cable was 39" on 3/16/11.

| * 10 MINUTE COUNTS * ——> | %

	Date	Time	High Voltage	Battery	Alpha: Alpha	Alpha: Beta	Beta: Alpha	Beta: Beta	Background: Alpha	Background: Beta	Efficiency: Alpha	Efficiency: Beta	Initial
7A office	3/16/11	09:10	700	✓	44063	6127	359	34335	22	2343	20.7	14.7	cf
G office	3/16/11	18:00	700	✓	44099	6416	54	32608	54	2385	20.7	13.9	cf
	~~3/17/11~~	~~0900~~	~~800~~	✓	~~44895~~	~~11824~~	~~779~~	~~37382~~	~~1128~~	~~4626~~	BAD	MYLAR	
						IN	MOVING	INSTRUMENT		TO	LONGER	CABLE	
						MY	LAR	WAS	DAMAGED.				
							* 3/16	AVG	EFFICIENCY:		20.7	14.3	

Reviewed By: [signature] Date: 3/22/11

ERG Form 1.30B

ERG

Function Check Form
Single Channel Detector

Ratemeter: LUDLUM 2221 Serial No. 262328 Cal. Due Date: 3-14-12

Detector: LUDLUM 44-10 Serial No. PR150786 Cal. Due Date: 3-16-12

Source: Cs-137 Activity: 4μCi (4/12/96) Serial No. 544-96

Comments: 14-FOOT CABLE USED.

Date	Time	Battery	High Voltage	Threshold	Gross Counts	Background	Net Counts	Efficiency	Initial
3/17/11	0830	5.4	1151	101	49220	10291	38929	—	TA
3/17/11	1630	5.3	1150	101	51322	10952	40370	—	TA

Reviewed By: [signature] Date: 3/22/11

ERG Form 1.30A

ERG

Certificate of Calibration

Calibration and Voltage Plateau

Environmental Restoration Group, Inc.
8809 Washington St NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224
www.ERGoffice.com

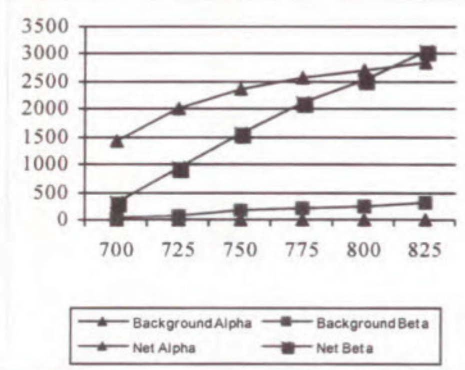
Meter:	Manufacturer:	Ludlum	Model Number:	2360	Serial Number:	215292
Detector:	Manufacturer:	Ludlum	Model Number:	43-93	Serial Number:	PR199836

☑ Mechanical Check ☑ Geotropism ☑ THR/WIN Operation ☑ Audio Check ☑ Battery Check (Min 4.4 VDC)
☐ F/S Response Check ☑ Meter Zeroed ☑ Reset Check HV Check (+/- 2.5%): ☑ 500 V ☑ 1000 V ☑ 1500 V
Source Distance: ☑ Contact ☐ 6 inches ☐ Other: Cable Length: ☐ 39-inch ☐ 72-inch ☑ Other: 12'
Source Geometry: ☐ Side ☑ Below ☐ Other: Temperature: 74 °F Relative Humidity 20 %
Alpha Threshold: 120 mV Beta Threshold: 4 Barometric Pressure: 24.83 inches Hg
Beta Window: 30 mV Instrument found within tolerance: ☑ Yes ☐ No

Range/Multiplier	Reference Setting	"As Found Reading"	Meter Reading	Integrated 1-Min. Count α	Integrated 1-Min. Count β
x 1000	400 Kcpm	400	400	398658	398788
x 1000	100 Kcpm	100	100		
x 100	40 Kcpm	400	400	39834	39836
x 100	10 Kcpm	100	100		
x 10	4 Kcpm	400	400	3982	3982
x 10	1 Kcpm	100	100		
x 1	400 cpm	400	400	398	398
x 1	100 cpm	100	100		

High Voltage	Alpha Source α	Alpha Source β	Beta Source α	Beta Source β	Background α	Background β
700	1421	340	30	365	0	43
725	2023	367	17	1011	0	74
750	2354	456	24	1727	3	156
775	2556	561	12	2333	2	213
800	2707	680	34	2788	4	256
825	2830	968	21	3383	2	323

Voltage Plateau



Comments: HV Plateau Scaler Count Time = 1-min. Recommended HV =800

Reference Instruments and/or Sources:

Ludlum pulser serial number: ☐ 97743 ☑ 201932 Fluke multimeter serial number ☑ 8749012

☑ Alpha Source: Th-230 @ 13,000 dpm (1/13/10) sn: 4098-03 ☐ Gamma Source Cs-137 @ 5.37 uCi (1/13/10) sn: 4097-03

☑ Beta Source: Tc-99 @ 17,700 dpm (1/13/10) sn: 4099-03 ☐ Other Source:

Calibrated By: [signature] Calibration Date: 3-15-11 Calibration Due: 3-15-12

Reviewed By: [signature] Date: 3/17/11

This calibration conforms to the requirements and acceptable calibration conditions of ANSI N323A - 1997.
NMRCB Registration No. 921-3 * Calibration of Radiation Detection Instrument Devices

ERG

Environmental Restoration Group, Inc.
8809 Washington St NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224
www.ERGoffice.com

Certificate of Calibration

Calibration and Voltage Plateau

Meter:	Manufacturer:	Ludlum	Model Number:	2360	Serial Number:	145462
Detector:	Manufacturer:	Ludlum	Model Number:	43-93	Serial Number:	PR299679

☑ Mechanical Check ☑ Geotropism ☑ THR/WIN Operation ☑ Audio Check ☑ Battery Check (Min 4.4 VDC)

☐ F/S Response Check ☑ Meter Zeroed ☑ Reset Check HV Check (+/- 2.5%): ☑ 500 V ☑ 1000 V ☑ 1500 V

Source Distance: ☑ Contact ☐ 6 inches ☐ Other: Cable Length: ☐ 39-inch ☐ 72-inch ☑ Other: 12'

Source Geometry: ☐ Side ☑ Below ☐ Other: Temperature: 72 °F Relative Humidity 20 %

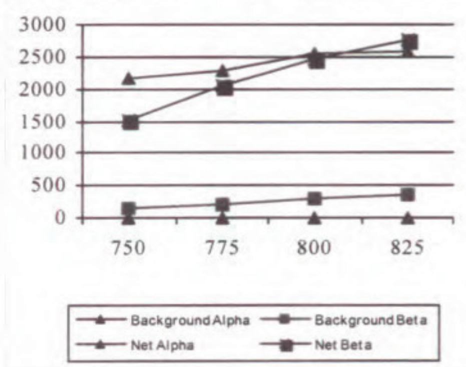
Alpha Threshold: 120 mV Beta Threshold: 4 Barometric Pressure: 24.68 inches Hg

Beta Window: 30 mV Instrument found within tolerance: ☑ Yes ☐ No

Range/Multiplier	Reference Setting	"As Found Reading"	Meter Reading	Integrated 1-Min. Count α	Integrated 1-Min. Count β
x 1000	400 Kcpm	400	400	399699	399748
x 1000	100 Kcpm	100	100		
x 100	40 Kcpm	400	400	39983	39996
x 100	10 Kcpm	100	100		
x 10	4 Kcpm	400	400	4000	3989
x 10	1 Kcpm	100	100		
x 1	400 cpm	400	400	399	399
x 1	100 cpm	100	100		

High Voltage	Alpha Source α	Alpha Source β	Beta Source α	Beta Source β	Background α	Background β
750	2164	385	31	1650	0	141
775	2276	454	39	2237	1	196
800	2556	603	22	2771	1	293
825	2602	708	25	3121	3	345

Voltage Plateau



Comments: HV Plateau Scaler Count Time = 1-min. Recommended HV =800

Reference Instruments and/or Sources:

Ludlum pulser serial number: ☐ 97743 ☑ 201932

Fluke multimeter serial number ☑ 8749012

☑ Alpha Source: Th-230 @ 13,000 dpm (1/13/10) sn: 4098-03

☐ Gamma Source Cs-137 @ 5.37 uCi (1/13/10) sn: 4097-03

☑ Beta Source: Tc-99 @ 17,700 dpm (1/13/10) sn: 4099-03

☐ Other Source:

Calibrated By: [signature] Calibration Date: 5-17-11 Calibration Due: 5-17-12

Reviewed By: [signature] Date: 3/17/11

ERG

Certificate of Calibration

Calibration and Voltage Plateau

Environmental Restoration Group, Inc.
8809 Washington St NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224
www.ERGoffice.com

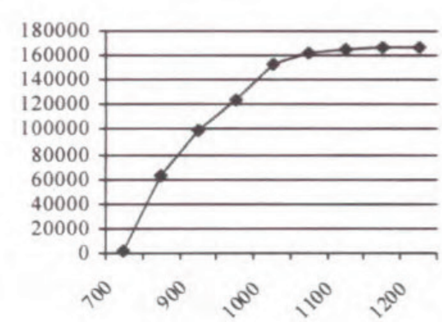
Meter:	Manufacturer:	Ludlum	Model Number:	2221	Serial Number:	262328
Detector:	Manufacturer:	Alpha Spectra	Model Number:	FIDLER	Serial Number:	010807F

☑ Mechanical Check ☑ Geotropism ☑ THR/WIN Operation ☑ Audio Check ☑ Battery Check (Min 4.4 VDC)
☑ F/S Response Check ☑ Meter Zeroed ☑ Reset Check HV Check (+/- 2.5%): ☑ 500 V ☑ 1000 V ☑ 1500 V
Source Distance: ☐ Contact ☐ 6 inches ☑ Other: 3/4" Cable Length: ☐ 39-inch ☐ 72-inch ☑ Other: 14'
Source Geometry: ☐ Side ☑ Below ☐ Other: Temperature: 74 °F Relative Humidity 20 %
Threshold: 10 mV Window: Barometric Pressure: 24.72 inches Hg
Instrument found within tolerance: ☑ Yes ☐ No

Range/Multiplier	Reference Setting	"As Found Reading"	Meter Reading	Integrated 1-Min. Count	Log Scale Count
x 1000	400	400	400	398663	400
x 1000	100	100	100		100
x 100	40	400	400	39854	400
x 100	10	100	100		100
x 10	4	400	400	3985	400
x 10	1	100	100		100
x 1	400	400	400	399	400
x 1	100	100	100		100

High Voltage	Source Counts	Background
700	1362	
800	63121	
900	99855	
950	123647	
1000	152143	
1050	162435	
1100	164685	
1150	165879	5832
1200	165734	

Voltage Plateau



Comments: HV Plateau Scaler Count Time = 0.5-min. Recommended HV =1150

Reference Instruments and/or Sources:

Ludlum pulser serial number: ☐ 97743 ☑ 201932 Fluke multimeter serial number: ☐ 8749012
☐ Alpha Source: Th-230 @ 13,000 dpm (1/13/10) sn: 4098-03 ☐ Gamma Source Cs-137 @ 5.37 uCi (1/13/10) sn: 4097-03
☐ Beta Source: Tc-99 @ 17,700 dpm (1/13/10) sn: 4099-03 ☑ Other Source: Am-241 @ 1uCi

Calibrated By: [signature] Calibration Date: 3-17-11 Calibration Due: 3-17-12

Reviewed By: [signature] Review Date: 3/17/11

This calibration conforms to the requirements and acceptable calibration conditions of ANSI N323A - 1997.
NMRCB Registration No. 921-3 * Calibration of Radiation Detection Instrument Devices

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Certificate of Calibration

Calibration and Voltage Plateau

Environmental Restoration Group, Inc.
8809 Washington St NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224
www.ERGoffice.com

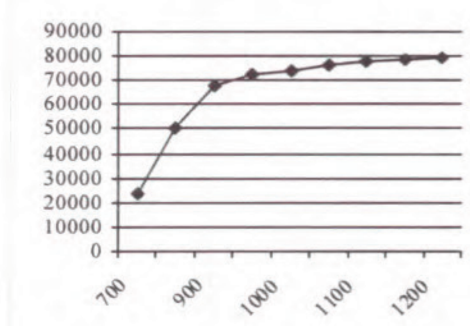
Meter:	Manufacturer:	Ludlum	Model Number:	2221	Serial Number:	262328
Detector:	Manufacturer:	Ludlum	Model Number:	44-10	Serial Number:	PR150786

☑ Mechanical Check ☑ Geotropism ☑ THR/WIN Operation ☑ Audio Check ☑ Battery Check (Min 4.4 VDC)
☑ F/S Response Check ☑ Meter Zeroed ☑ Reset Check HV Check (+/- 2.5%): ☑ 500 V ☑ 1000 V ☑ 1500 V
Source Distance: ☐ Contact ☑ 6 inches ☐ Other: Cable Length: ☐ 39-inch ☐ 72-inch ☑ Other: 14'
Source Geometry: ☑ Side ☐ Below ☐ Other: Temperature: 74 °F Relative Humidity 20 %
Threshold: 10 mV Window: Barometric Pressure: 24.72 inches Hg
Instrument found within tolerance: ☑ Yes ☐ No

Range/Multiplier	Reference Setting	"As Found Reading"	Meter Reading	Integrated 1-Min. Count	Log Scale Count
x 1000	400	400	400	398663	400
x 1000	100	100	100		100
x 100	40	400	400	39854	400
x 100	10	100	100		100
x 10	4	400	400	3985	400
x 10	1	100	100		100
x 1	400	400	400	399	400
x 1	100	100	100		100

High Voltage	Source Counts	Background
700	23405	
800	50120	
900	67861	
950	72174	
1000	73869	
1050	76528	
1100	78121	
1150	78357	11394
1200	79121	

Voltage Plateau



Comments: HV Plateau Scaler Count Time = 1-min. Recommended HV =1150

Reference Instruments and/or Sources:

Ludlum pulser serial number: ☐ 97743 ☑ 201932
Fluke multimeter serial number: ☐ 8749012
☐ Alpha Source: Th-230 @ 13,000 dpm (1/13/10) sn: 4098-03
☑ Gamma Source Cs-137 @ 5.37 uCi (1/13/10) sn: 4097-03
☐ Beta Source: Tc-99 @ 17,700 dpm (1/13/10) sn: 4099-03
☐ Other Source: Am-241 @ 1uCi

Calibrated By: [signature] Calibration Date: 3-17-11 Calibration Due: 3-17-12

Reviewed By: [signature] Review Date: 3/17/11

CERTIFICATE OF CALIBRATION

Electroplated Beta Standard

S.O.# 3905
P.O.# 0423

Description of Standard:

Model No. DNS-12 Serial No. 4004-02 Isotope Tc-99

Electroplated on polished SS disc, 0.79 mm thick.

Total diameter of 4.77 cm and an active diameter of 4.45 cm.

The radioactive material is permanently fixed to the disc by heat treatment without any covering over the active surface.

Measurement Method:

The 2pi beta emission rate was measured using an internal gas flow proportional chamber. Absolute counting of beta particles emitted in the hemisphere above the active surface was verified by counting above, below, and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrated beta source S/N 2148/90.

Measurement Result:

The observed beta count rate from the surface of the disc per minute (cpm) on the calibration date was:

13,600 ± 407

The total disintegration rate (dpm) assuming 25 % backscatter of beta particles from the surface of the disc, was:

21,700 ± 651 (0.00978 μCi)

The uncertainty of the measurement is 3 %, which is the sum of random counting error at the 99% confidence level, and the estimated upper limit of systematic error in this measurement.

Calibrated by: ART REUST Reviewed by: [signature]

Calibration Technician: Art Reust Q.A. Representative: Karen Schoenfeller

Calibration Date: 6-27-2002 Reviewed Date: 6-27-02

Analytical Services
7021 Pan American Freeway NE
Albuquerque, New Mexico 87109-4238
(505) 345-3461 Fax (505) 761-5416
Toll Free (866) RAD-LABS (723-5227)
www.eberlineservices.com

EBERLINE
SERVICES

CERTIFICATE OF CALIBRATION

Electroplated Alpha Standard

S.O.# 6233
P.O.# 1093

Description of Standard:

Model No. DNS-11 Serial No. 5447-05 Isotope Th-230

Electroplated on polished SS disc, 0.79 mm thick.

Total diameter of 4.77 cm and an active diameter of 4.45 cm.

The radioactive material is permanently fixed to the disc by heat treatment without any covering over the active surface.

Measurement Method:

The 2pi alpha emission rate was measured using an internal gas flow proportional chamber. Absolute counting of alpha particles emitted in the hemisphere above the active surface was verified by counting above, below, and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrated alpha source S/N 4001-02 .

Measurement Result:

The observed alpha particles emitted from the surface of the disc per minute (cpm) on the calibration date was:

10,800 ± 431

The total disintegration rate (dpm) assuming 1.5% backscatter of alpha particles from the surface of the disc, was:

21,300 ± 850 (0.00958 μCi)

The uncertainty of the measurement is 4 %, which is the sum of random counting error at the 99% confidence level, and the estimated upper limit of systematic error in this measurement.

Calibrated by: ART REUST Reviewed by: [signature]

Calibration Technician: Art Reust Q.A. Representative: [signature]

Calibration Date: 3-28-2005 Reviewed Date: 032805

Analytical Services
7021 Pan American Freeway NE
Albuquerque, New Mexico 87109-4238
(505) 345-3461 Fax (505) 761-5416
Toll Free (866) RAD-LABS (723-5227)
www.eberlineservices.com

Certificate of Calibration

Calibration and Voltage Plateau

Environmental Restoration Group, Inc.
8809 Washington St NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224
www.ERGoffice.com

Meter:	Manufacturer:	Ludlum	Model Number:	2360	Serial Number:	215279
Detector:	Manufacturer:	Ludlum	Model Number:	43-93	Serial Number:	PR299677

☑ Mechanical Check ☑ Geotropism ☑ THR/WIN Operation ☑ Audio Check ☑ Battery Check (Min 4.4 VDC)
☐ F/S Response Check ☑ Meter Zeroed ☑ Reset Check HV Check (+/- 2.5%): ☑ 500 V ☑ 1000 V ☑ 1500 V

Source Distance: ☑ Contact ☐ 6 inches ☐ Other: Cable Length: ☐ 39-inch ☐ 72-inch ☑ Other: 60"

Source Geometry: ☐ Side ☑ Below ☐ Other: Temperature: 72 °F Relative Humidity 20 %

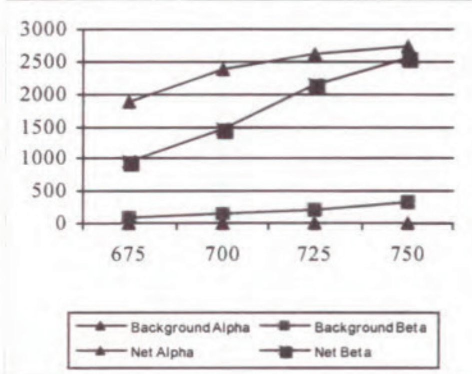
Alpha Threshold: 120 mV Beta Threshold: 4 Barometric Pressure: 24.72 inches Hg

Beta Window: 30 mV Instrument found within tolerance: ☑ Yes ☐ No

Range/Multiplier	Reference Setting	"As Found Reading"	Meter Reading	Integrated 1-Min. Count α	Integrated 1-Min. Count β
x 1000	400 Kcpm	400	400	398278	398344
x 1000	100 Kcpm	100	100		
x 100	40 Kcpm	400	400	39862	39872
x 100	10 Kcpm	100	100		
x 10	4 Kcpm	400	400	3988	3988
x 10	1 Kcpm	100	100		
x 1	400 cpm	400	400	399	399
x 1	100 cpm	100	100		

High Voltage	Alpha Source α	Alpha Source β	Beta Source α	Beta Source β	Background α	Background β
675	1885	312	4	1025	1	85
700	2375	413	4	1618	3	158
725	2621	483	6	2348	5	222
750	2745	636	5	2878	2	337

Voltage Plateau



Comments: HV Plateau Scaler Count Time = 1-min. Recommended HV =725

Reference Instruments and/or Sources:

Ludlum pulser serial number: ☐ 97743 ☑ 201932 Fluke multimeter serial number ☑ 8749012

☑ Alpha Source: Th-230 @ 13,000 dpm (1/13/10) sn: 4098-03 ☐ Gamma Source Cs-137 @ 5.37 uCi (1/13/10) sn: 4097-03

☑ Beta Source: Tc-99 @ 17,700 dpm (1/13/10) sn: 4099-03 ☐ Other Source:

Calibrated By: [signature] Calibration Date: 3-14-11 Calibration Due: 3-14-12

Reviewed By: [signature] Date: 3/15/11

ERG Certificate of Calibration

Calibration and Voltage Plateau

Environmental Restoration Group, Inc.
8809 Washington St NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224
www.ERGoffice.com

Meter:	Manufacturer:	Ludlum	Model Number:	2360	Serial Number:	145462
Detector:	Manufacturer:	Ludlum	Model Number:	43-93	Serial Number:	PR299679

☑ Mechanical Check ☑ Geotropism ☑ THR/WIN Operation ☑ Audio Check ☑ Battery Check (Min 4.4 VDC)

☐ F/S Response Check ☑ Meter Zeroed ☑ Reset Check HV Check (+/- 2.5%): ☑ 500 V ☑ 1000 V ☑ 1500 V

Source Distance: ☑ Contact ☐ 6 inches ☐ Other: Cable Length: ☑ 39-inch ☐ 72-inch ☐ Other:

Source Geometry: ☐ Side ☑ Below ☐ Other: Temperature: 72 °F Relative Humidity 20 %

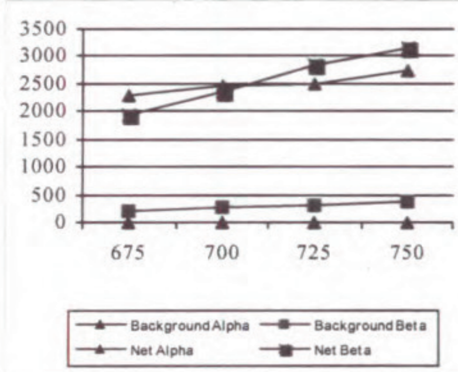
Alpha Threshold: 120 mV Beta Threshold: 4 Barometric Pressure: 24.68 inches Hg

Beta Window: 30 mV Instrument found within tolerance: ☑ Yes ☐ No

Range/Multiplier	Reference Setting	"As Found Reading"	Meter Reading	Integrated 1-Min. Count α	Integrated 1-Min. Count β
x 1000	400 Kcpm	400	400	399699	399748
x 1000	100 Kcpm	100	100		
x 100	40 Kcpm	400	400	39983	39996
x 100	10 Kcpm	100	100		
x 10	4 Kcpm	400	400	4000	3989
x 10	1 Kcpm	100	100		
x 1	400 cpm	400	400	399	399
x 1	100 cpm	100	100		

High Voltage	Alpha Source α	Alpha Source β	Beta Source α	Beta Source β	Background α	Background β
675	2286	399	43	2146	2	191
700	2466	488	43	2650	0	284
725	2512	574	59	3175	0	329
750	2748	790	45	3552	2	394

Voltage Plateau



Comments: HV Plateau Scaler Count Time = 1-min. Recommended HV =700

Reference Instruments and/or Sources:

Ludlum pulser serial number: ☐ 97743 ☑ 201932 Fluke multimeter serial number ☑ 8749012

☑ Alpha Source: Th-230 @ 13,000 dpm (1/13/10) sn: 4098-03 ☐ Gamma Source Cs-137 @ 5.37 uCi (1/13/10) sn: 4097-03

☑ Beta Source: Tc-99 @ 17,700 dpm (1/13/10) sn: 4099-03 ☐ Other Source:

Calibrated By: Calibration Date: 3-14-11 Calibration Due: 3-14-12

Reviewed By: Date: 3/15/11

This calibration conforms to the requirements and acceptable calibration conditions of ANSI N323A - 1997.
NMRCB Registration No. 921-3 * Calibration of Radiation Detection Instrument Devices

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Certificate of Calibration

Calibration and Voltage Plateau

Environmental Restoration Group, Inc.
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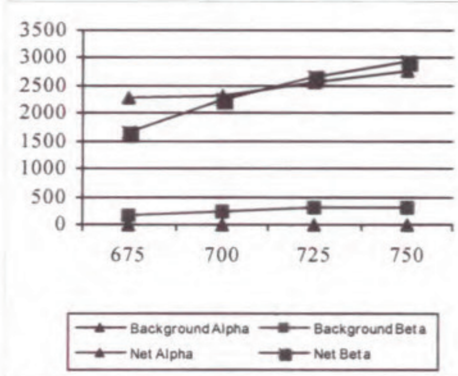
Meter:	Manufacturer:	Ludlum	Model Number:	2360	Serial Number:	275739
Detector:	Manufacturer:	Ludlum	Model Number:	43-93	Serial Number:	PR298426

☑ Mechanical Check ☑ Geotropism ☑ THR/WIN Operation ☑ Audio Check ☑ Battery Check (Min 4.4 VDC)
☐ F/S Response Check ☑ Meter Zeroed ☑ Reset Check HV Check (+/- 2.5%): ☑ 500 V ☑ 1000 V ☑ 1500 V
Source Distance: ☑ Contact ☐ 6 inches ☐ Other: Cable Length: ☑ 39-inch ☐ 72-inch ☐ Other:
Source Geometry: ☐ Side ☑ Below ☐ Other: Temperature: 72 °F Relative Humidity 20 %
Alpha Threshold: 120 mV Beta Threshold: 4 Barometric Pressure: 24.72 inches Hg
Beta Window: 30 mV Instrument found within tolerance: ☑ Yes ☐ No

Range/Multiplier	Reference Setting	"As Found Reading"	Meter Reading	Integrated 1-Min. Count α	Integrated 1-Min. Count β
x 1000	400 Kcpm	400	400	399011	399006
x 1000	100 Kcpm	100	100		
x 100	40 Kcpm	400	400	39875	39902
x 100	10 Kcpm	100	100		
x 10	4 Kcpm	400	400	3990	3991
x 10	1 Kcpm	100	100		
x 1	400 cpm	400	400	399	399
x 1	100 cpm	100	100		

High Voltage	Alpha Source α	Alpha Source β	Beta Source α	Beta Source β	Background α	Background β
675	2302	336	75	1864	2	186
700	2320	383	56	2478	2	236
725	2580	485	72	2963	2	298
750	2762	606	55	3284	1	329

Voltage Plateau



Comments: HV Plateau Scaler Count Time = 1-min. Recommended HV =725

Reference Instruments and/or Sources:

Ludlum pulser serial number: ☐ 97743 ☑ 201932 Fluke multimeter serial number ☑ 8749012
☑ Alpha Source: Th-230 @ 13,000 dpm (1/13/10) sn: 4098-03 ☐ Gamma Source Cs-137 @ 5.37 uCi (1/13/10) sn: 4097-03
☑ Beta Source: Tc-99 @ 17,700 dpm (1/13/10) sn: 4099-03 ☐ Other Source:

Calibrated By: Calibration Date: 3-14-11 Calibration Due: 3-14-12

Reviewed By: Date: 3/15/11

This calibration conforms to the requirements and acceptable calibration conditions of ANSI N323A - 1997.
NMRCB Registration No. 921-3 * Calibration of Radiation Detection Instrument Devices

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Certificate of Calibration

Calibration and Voltage Plateau

Environmental Restoration Group, Inc.
8809 Washington St NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224
www.ERGoffice.com

Meter:	Manufacturer:	Ludlum	Model Number:	2360	Serial Number:	215292
Detector:	Manufacturer:	Ludlum	Model Number:	43-93	Serial Number:	PR199836

☑ Mechanical Check ☑ Geotropism ☑ THR/WIN Operation ☑ Audio Check ☑ Battery Check (Min 4.4 VDC)

☐ F/S Response Check ☑ Meter Zeroed ☑ Reset Check HV Check (+/- 2.5%): ☑ 500 V ☑ 1000 V ☑ 1500 V

Source Distance: ☑ Contact ☐ 6 inches ☐ Other: Cable Length: ☑ 39-inch ☐ 72-inch ☐ Other:

Source Geometry: ☐ Side ☑ Below ☐ Other: Temperature: 74 °F Relative Humidity 20 %

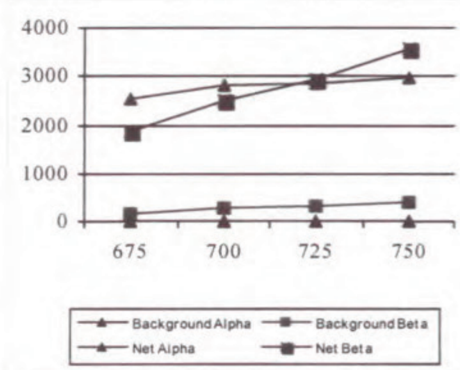
Alpha Threshold: 120 mV Beta Threshold: 4 Barometric Pressure: 24.83 inches Hg

Beta Window: 30 mV Instrument found within tolerance: ☑ Yes ☐ No

Range/Multiplier	Reference Setting	"As Found Reading"	Meter Reading	Integrated 1-Min. Count α	Integrated 1-Min. Count β
x 1000	400 Kcpm	400	400	398658	398788
x 1000	100 Kcpm	100	100		
x 100	40 Kcpm	400	400	39834	39836
x 100	10 Kcpm	100	100		
x 10	4 Kcpm	400	400	3982	3982
x 10	1 Kcpm	100	100		
x 1	400 cpm	400	400	398	398
x 1	100 cpm	100	100		

High Voltage	Alpha Source α	Alpha Source β	Beta Source α	Beta Source β	Background α	Background β
675	2536	432	5	2045	3	171
700	2811	553	1	2767	3	264
725	2861	723	4	3250	1	321
750	2982	930	6	3946	2	377

Voltage Plateau



Comments: HV Plateau Scaler Count Time = 1-min. Recommended HV =700

Reference Instruments and/or Sources:

Ludlum pulser serial number: ☐ 97743 ☑ 201932 Fluke multimeter serial number ☑ 8749012

☑ Alpha Source: Th-230 @ 13,000 dpm (1/13/10) sn: 4098-03 ☐ Gamma Source Cs-137 @ 5.37 uCi (1/13/10) sn: 4097-03

☑ Beta Source: Tc-99 @ 17,700 dpm (1/13/10) sn: 4099-03 ☐ Other Source:

Calibrated By: [signature] Calibration Date: 3-10-11 Calibration Due: 3-10-12

Reviewed By: [signature] Date: 3/15/11

This calibration conforms to the requirements and acceptable calibration conditions of ANSI N323A - 1997.
NMRCB Registration No. 921-3 * Calibration of Radiation Detection Instrument Devices

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Certificate of Calibration

Calibration and Voltage Plateau

Environmental Restoration Group, Inc.
8809 Washington St NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224
www.ERGoffice.com

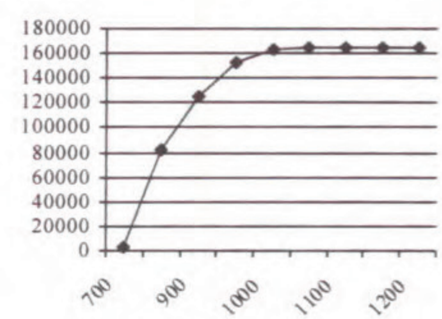
Meter:	Manufacturer:	Ludlum	Model Number:	2221	Serial Number:	262328
Detector:	Manufacturer:	Alpha Spectra	Model Number:	FIDLER	Serial Number:	010807F

☑ Mechanical Check ☑ Geotropism ☑ THR/WIN Operation ☑ Audio Check ☑ Battery Check (Min 4.4 VDC)
☑ F/S Response Check ☑ Meter Zeroed ☑ Reset Check HV Check (+/- 2.5%): ☑ 500 V ☑ 1000 V ☑ 1500 V
Source Distance: ☐ Contact ☐ 6 inches ☑ Other: 3/4" Cable Length: ☐ 39-inch ☑ 72-inch ☐ Other:
Source Geometry: ☐ Side ☑ Below ☐ Other: Temperature: 74 °F Relative Humidity 20 %
Threshold: 10 mV Window: Barometric Pressure: 24.72 inches Hg
Instrument found within tolerance: ☑ Yes ☐ No

Range/Multiplier	Reference Setting	"As Found Reading"	Meter Reading	Integrated 1-Min. Count	Log Scale Count
x 1000	400	400	400	398663	400
x 1000	100	100	100		100
x 100	40	400	400	39854	400
x 100	10	100	100		100
x 10	4	400	400	3985	400
x 10	1	100	100		100
x 1	400	400	400	399	400
x 1	100	100	100		100

High Voltage	Source Counts	Background
700	3394	
800	82951	
900	125821	
950	153058	
1000	162911	
1050	164452	
1100	164142	5547
1150	164542	
1200	164589	

Voltage Plateau



Comments: HV Plateau Scaler Count Time = 0.5-min. Recommended HV =1100

Reference Instruments and/or Sources:

Ludlum pulser serial number: ☐ 97743 ☑ 201932 Fluke multimeter serial number: ☐ 8749012
☐ Alpha Source: Th-230 @ 13,000 dpm (1/13/10) sn: 4098-03 ☐ Gamma Source Cs-137 @ 5.37 uCi (1/13/10) sn: 4097-03
☐ Beta Source: Tc-99 @ 17,700 dpm (1/13/10) sn: 4099-03 ☑ Other Source: Am-241 @ 1uCi

Calibrated By: Calibration Date: 3-14-11 Calibration Due: 3-14-12

Reviewed By: Review Date: 3/14/11

This calibration conforms to the requirements and acceptable calibration conditions of ANSI N323A - 1997.
NMRCB Registration No. 921-3 * Calibration of Radiation Detection Instrument Devices

Los Alamos Technical Associates, Inc.

999 Central Ave., Suite 300 / Los Alamos, NM 87544 / Telephone (505) 662-9080 / FAX (505) 662-1757

July 13, 2011

Mr. Mark Thacker
Los Alamos National Security
Los Alamos National Laboratory
P. O. Box 1663, MS C349
Los Alamos, NM 87545
Transmitted via email: mthacker@lanl.gov

SUBJECT: 78450-002-11, Radiological Survey Report for the remainder of 21-011(b) and 21-004(b)-99

Dear Mr. Thacker:

Los Alamos Technical Associates (LATA) is pleased to submit the subject report. ERG conducted the onsite effort June 23, 2011.

If you have any questions, please contact me at 662-1816 or Joe Sena, our Field Operations Manager at 662-1837.

Sincerely,

Felicia M. Aguilar

Felicia M. Aguilar
Project Manager

Cy: F. Stafford, via email
M. Thacker, via email
B. Wedgeworth, via email
J. Byers, via email
J. Sena, via email
J. Lockhart, via email

Radiological Survey of SWMU
21-011(B) Waste Line Trenches and 21-004(b)-99 at the
Los Alamos National Laboratory

Prepared for:

Los Alamos Technical Associates, Inc.

Los Alamos Technical Associates, Inc.
999 Central Ave.
Los Alamos, NM 87544

Prepared by:

Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM 87113

July, 2011

Radiological Survey of SWMU 21-011(b)-99 Pipe Trench

1.0 Introduction

Los Alamos Technical Associates (LATA) retained Environmental Restoration Group, Inc. (ERG) to conduct a static alpha-beta surface survey and GPS-based gamma surveys of excavated waste line pipe trenches at Los Alamos National Laboratory (LANL) Technical Area 21 (TA-21) Solid Waste Management Units (SWMU) 21-011(b) and 21-004(b)-99. Surveys were performed on three excavated acid waste line trenches at 21-011(b) known as Sections 155, 209, and 155/209 and were approximately 200, 33, and 55 linear feet in length, respectively. At 21-004(b)-99 a survey was performed over an area of approximately 135 ft^2. All surveys were performed on June 23, 2011.

Possible radiological constituents at these areas include Pu-239, Am-241, Sr-90, Cs-137, and H-3. Because of this an alpha/beta survey, low-energy gamma survey, and high-energy gamma survey were performed.

2.0 Method

For the alpha/beta survey a static 1-minute alpha/beta scaler measurement was made on the floor of each of the trenches at 10-foot intervals for the length of the entire trench. For 21-004(b)-99, several static measurements were taken at each of several predetermined grid node locations. In addition, several static locations were taken outside the excavated area, primarily where water runoff was most likely to occur. Measurements were performed using matched Ludlum Model 43-93 alpha/beta Phoswhich detectors coupled to Ludlum Model 2360 dual-channel scalers. For areas of the trenches that were inaccessible by personnel, the detector was mounted onto a pole, allowing the surveyor to safely stand outside of the trench and survey the trench bottom.

The gamma surveys were performed using a Ludlum Model 2221 ratemeter/scaler with appropriate gamma detector, coupled to a Trimble Pro XRS mapping grade GPS. The Ludlum Model 2221 and GPS unit were both carried in a backpack with the Ludlum Model 2221 operated in ratemeter mode, allowing for each gamma count rate and associated coordinates to be recorded every one second. For the low-energy gamma survey, an Alpha Spectra 5-inch diameter FIDLER detector was used, and located approximately 6 inches above the trench floor. For the high-energy gamma survey, a Ludlum Model 44-10 2-inch by 2-inch sodium iodide (NaI) detector was used, and located approximately 18 inches above the trench floor. The scanning speed for both gamma surveys was approximately 1.0 ft/sec. For inaccessible areas the gamma detectors were suspended from a pole down the trench allowing for the survey to be conducted in the same manner and height above trench bottom as the accessible areas of the trench. In addition to ratemeter scan data, one-minute static scaler counts were taken at each location in 21-004(b)-99. The counts were performed using both a high-energy and low-energy gamma detector and detector height was maintained similar to that of the mobile detector surveys. At the end of the survey, the data were downloaded into a laptop computer and processed using a combination of Trimble Pathfinder Office and ESRI ArcGIS computer applications.

3.0 Results

Data for the alpha/beta survey were converted to disintegrations per minute per 100 cm^2 (dpm/100cm^2) using the average detector efficiencies and average reference background readings for each detector. The measurements are summarized in Tables 3.1, 3.2, 3.3, and 3.4. No alpha/beta readings exceeded 30 dpm/100 cm^2 for alpha, or 2,100 dpm/100 cm^2 for beta. No static gamma readings exceeded 26,000 cpm for low energy or 20,000 cpm for high energy.

Table 3.1 – 21-011(B)-209 Alpha and Beta Static Measurements

Location ID	Alpha (CPM)	Beta (CPM)	Alpha (dpm/100cm^2)	Beta (dpm/100cm^2)
0	2	502	0.00	814.39
1	4	542	0.00	1102.16
2	1	543	0.00	1109.35
3	6	468	0.97	569.78
4	2	457	0.00	490.65
5	5	487	0.00	706.47

Table 3.2 – 21-011(B)-155/209 Alpha and Beta Static Measurements

Location ID	Alpha (CPM)	Beta (CPM)	Alpha (dpm/100cm^2)	Beta (dpm/100cm^2)
0	4	521	0.00	951.08
1	9	652	15.50	1893.53
2	9	524	15.50	972.66
3	9	502	15.50	814.39
0	4	521	0.00	951.08
1	9	652	15.50	1893.53

Table 3.3 – 21-011(B)-155 Alpha and Beta Static Measurements

Location ID	Alpha (CPM)	Beta (CPM)	Alpha (dpm/100cm^2)	Beta (dpm/100cm^2)
0	7	420	5.81	224.46
1	11	348	25.18	0.00
2	8	405	10.65	116.55
3	10	518	20.34	929.50
4	10	418	20.34	210.07
5	4	673	0.00	2044.60
6	5	367	0.00	0.00
7	7	620	5.81	1663.31
8	5	464	0.00	541.01
9	5	449	0.00	433.09
10	9	496	15.50	771.22
11	5	437	0.00	346.76
12	5	427	0.00	274.82
13	4	435	0.00	332.37
14	2	434	0.00	325.18
15	7	474	5.81	612.95
16	8	458	10.65	497.84
17	8	461	10.65	519.42
18	5	469	0.00	576.98
19	3	408	0.00	138.13

Table 3.4 – 21-004(B)-99 Alpha, Beta, and Gamma Static Measurements

Location ID	Alpha (CPM)	Beta (CPM)	Gamma Low Energy (CPM)	Gamma High Energy (CPM)	Alpha (dpm/100cm^2)	Beta (dpm/100cm^2)
0	4	532	25403	19745	0.00	1030.22
1	8	475	22156	18560	10.65	620.14
2	8	527	22618	18143	10.65	994.24
3	8	379	22017	18381	10.65	0.00
4	9	602	21955	18244	15.50	1533.81
5	11	447	18882	17697	25.18	418.71
6	5	403	19572	18797	0.00	102.16
7	8	417	18965	18634	10.65	202.88
8	13	449	18816	19722	34.87	433.09
9	8	404	16923	16145	10.65	109.35
10	8	383	16819	15501	10.65	0.00
11	8	397	16642	15555	10.65	58.99
12	3	402	18853	17971	0.00	94.96
13	11	430	21358	18511	25.18	296.40
14	8	586	22280	19033	10.65	1418.71
15	8	462	21688	19640	10.65	526.62
16	1	560	18863	16841	0.00	1231.65
17	7	426	18683	17025	5.81	267.63
18	5	384	18951	16780	0.00	0.00
19	5	485	19512	18935	0.00	692.09
20	13	380	20429	17770	34.87	0.00
22	5	345	19334	17110	0.00	0.00
22	5	345	19334	17110	0.00	0.00
23	3	357	15736	15737	0.00	0.00

The alpha/beta detector survey data statistics are shown below in Table 3.5.

Table 3.5 Alpha/Beta Detector Survey Results

Area	Channel	Readings	Mean (dpm/100cm^2)	Standard Deviation (dpm/100cm^2)	Maximum Reading (dpm/100cm^2)	Minimum Reading (dpm/100cm^2)
155	Alpha	20	6.5	8	25.2	0
	Beta		528	504	2045	0
209	Alpha	5	11.6	6.7	15.5	0
	Beta		1158	429	1894	814
155/209	Alpha	6	0.2	0.4	1	0
	Beta		799	240	1109	491
99	Alpha	24	9.9	10.5	35	0
	Beta		418	478	1534	0

These data are also presented below in Figures 3.1 and 3.2. The figures represent the approximate location of each measurement for each area.

Figure 3.1 Alpha/Beta Survey of 21-011(b) Areas 155, 209, and 155/209 Waste Line Trenches

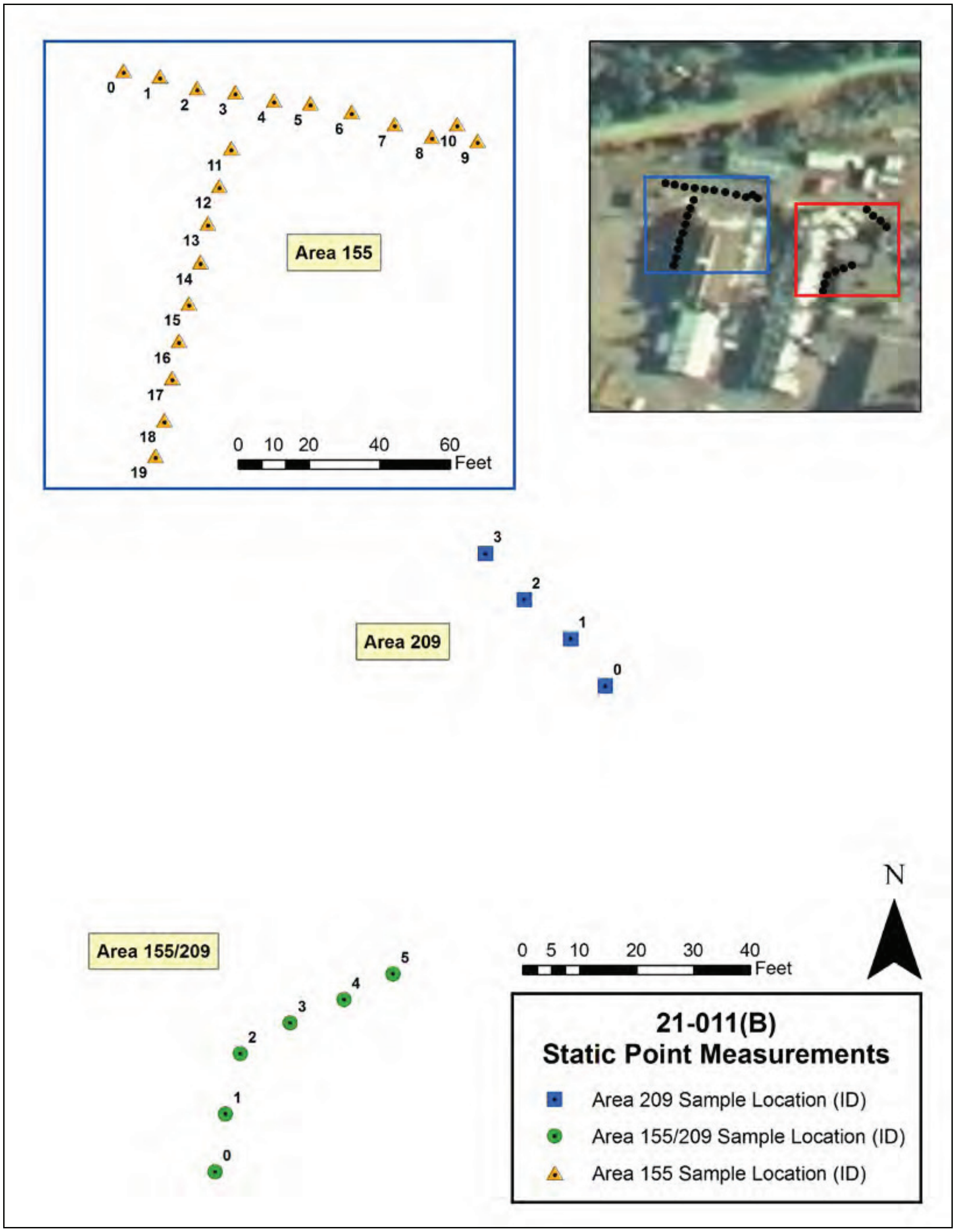
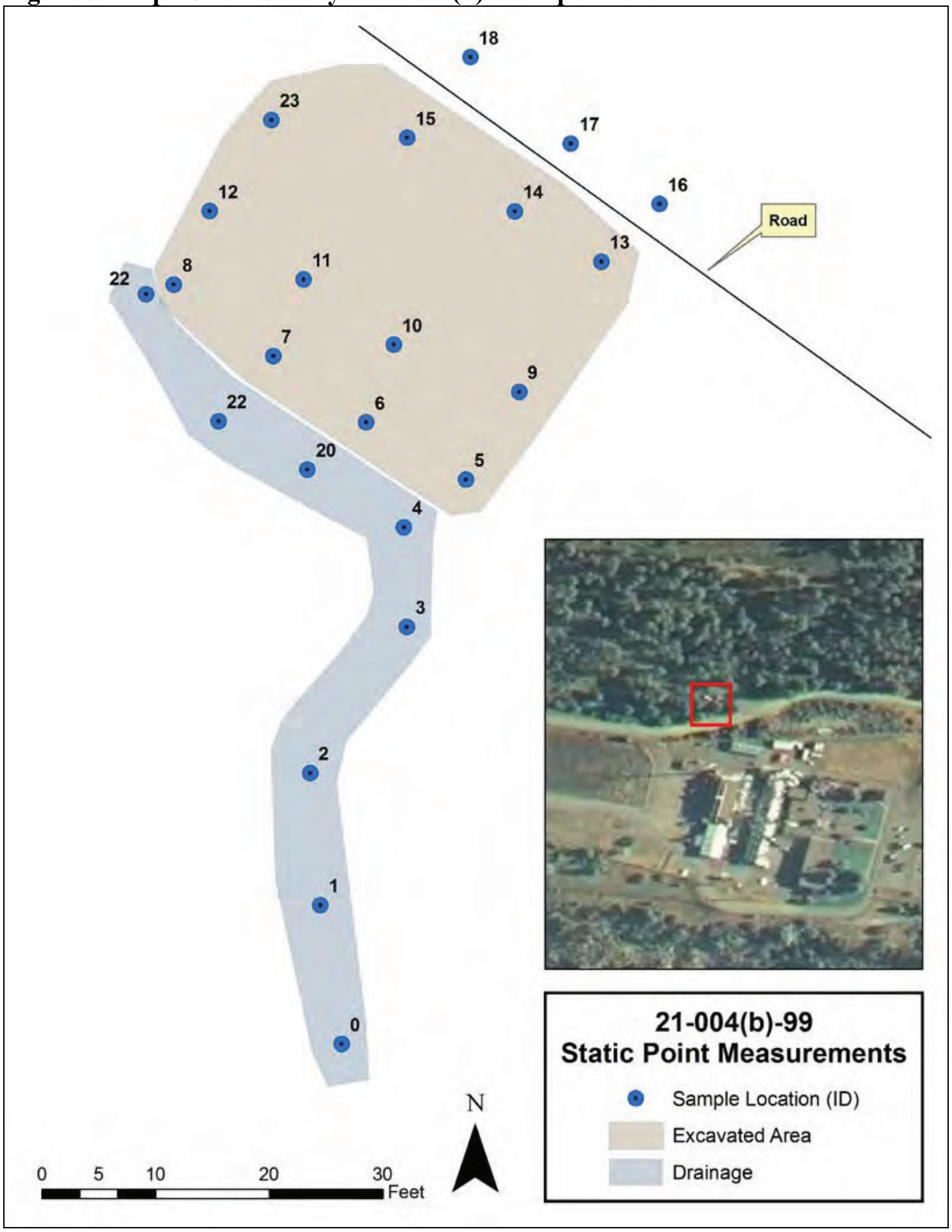


Figure 3.2 Alpha/Beta Survey of 21-004(b)- 99 Pipe Trench



3.2 Gamma Surveys

Data for the FIDLER detector (low-energy) and NaI detector (high-energy) gamma scan surveys are presented below in Figure 3.3 and Figure 3.4. The data within each figure are presented with varying colors depicting the gamma count-rate range for each survey.

Figure 3.3 High-Energy Gamma Survey of 21-011(b) an 21-004(b) -99

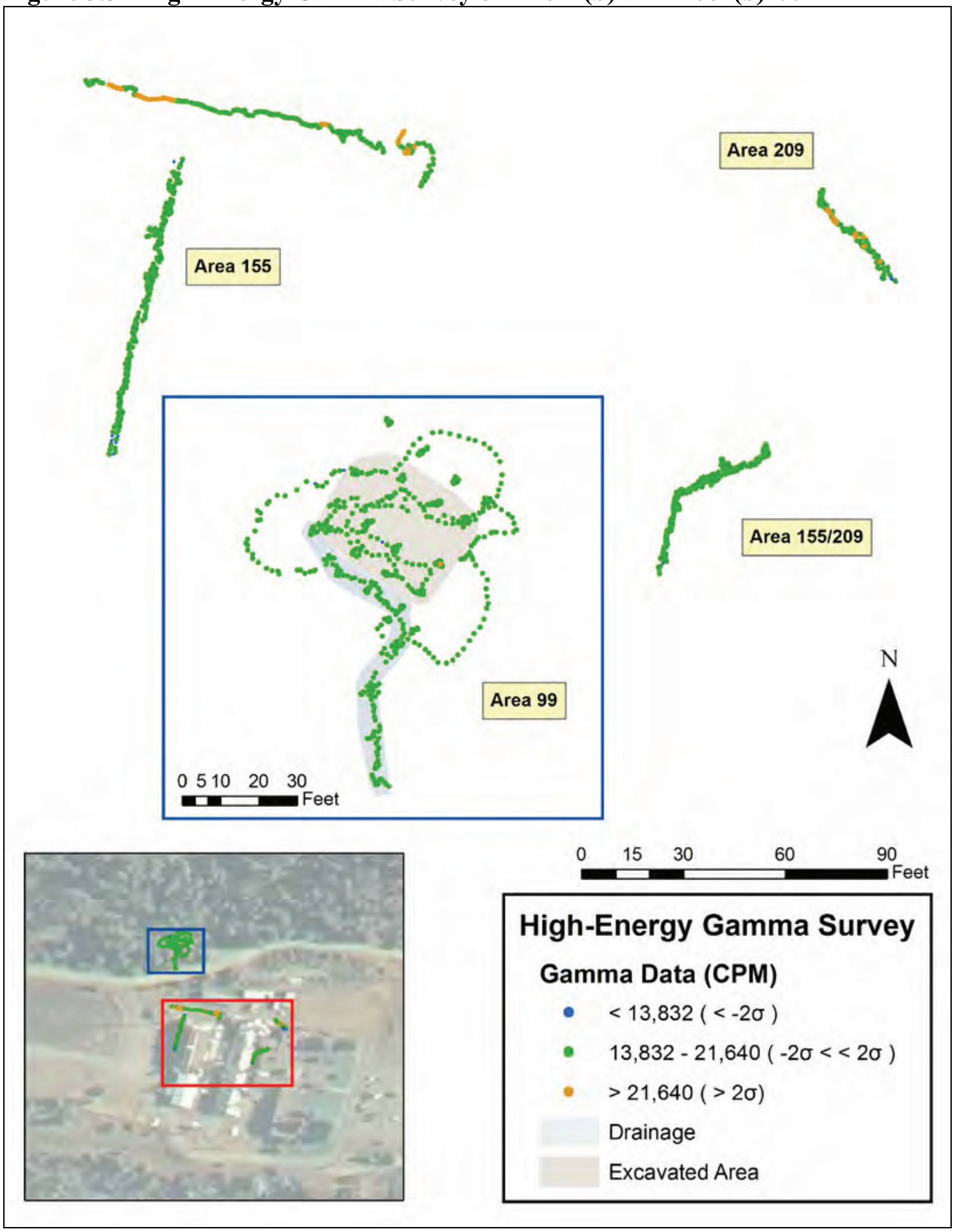
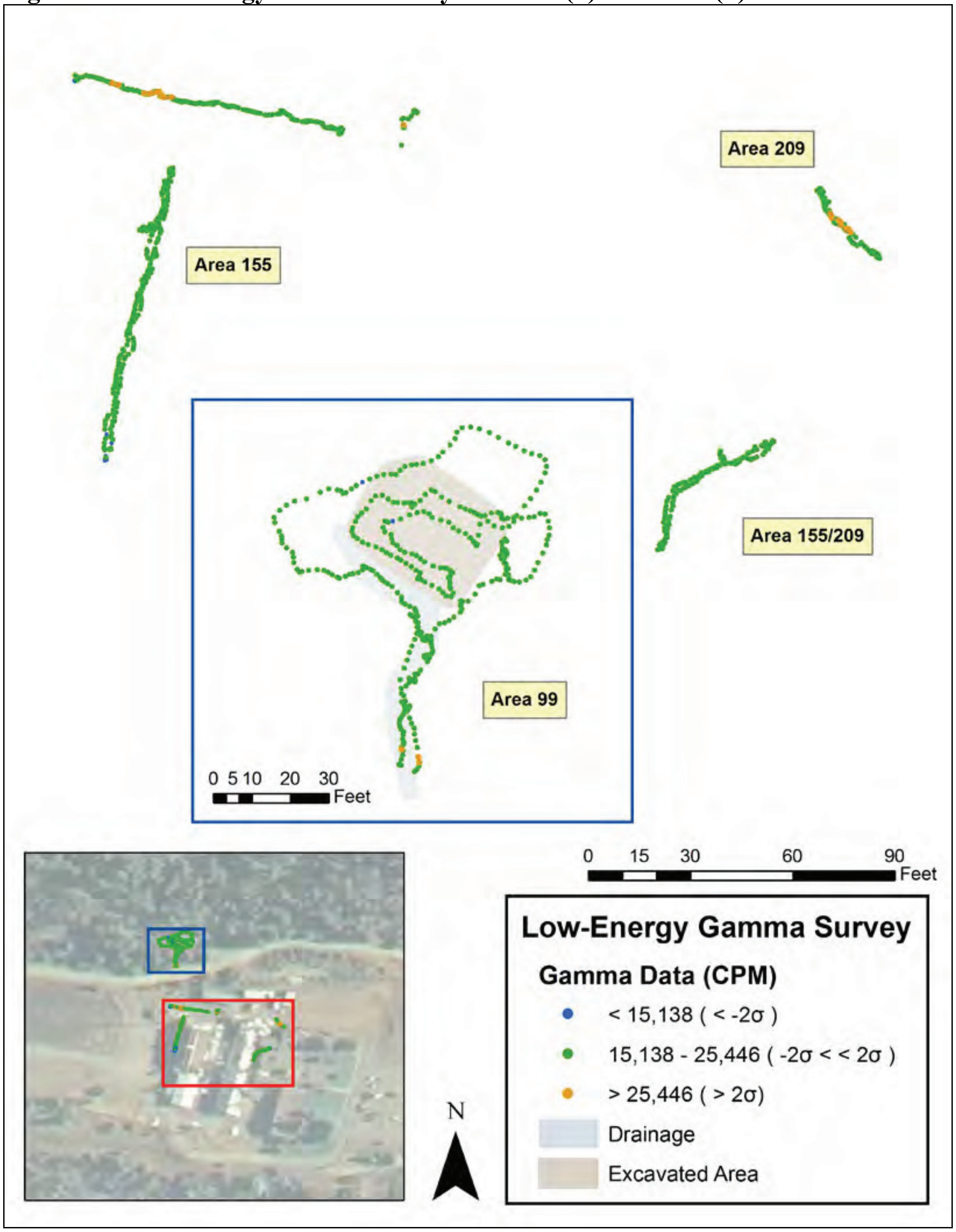


Figure 3.4 Low-Energy Gamma Survey of 21-011(b) an 21-004(b) -99



Due to the geometry of a trench (floor plus two sidewalls), readings taken inside the trench would be non-representative of any reference reading taken outside the trench. Because of this, the determination of elevated readings is based on the expected statistical spread of the data.

Gamma radiation detection from a single source is a random process that will result in a Poisson probability distribution of count rates, with the larger percentage of the count rates clustered around the mean and only a small percentage within the tails of the distribution above and below the mean. Highly elevated readings from sources other than background are typically identifiable by a distribution that is heavily weighted on the right side or that contains a sample that falls outside the typical spread from background radiation. Distribution of the low-energy FIDLER detector and high-energy NaI detector data for all locations are presented below in Figures 3.4 and 3.5, respectively. Both figures show the data fit the expected Poisson distributions with no right side tail outliers. The distributions for both surveys are similar.

Figure 3.5 Low-energy FIDLER Detector Data Distribution

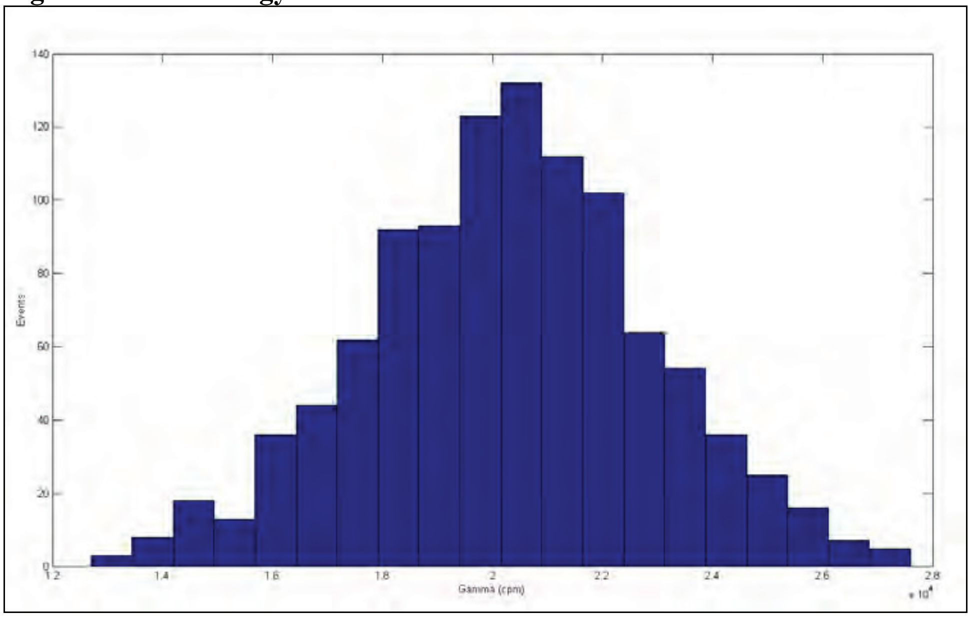
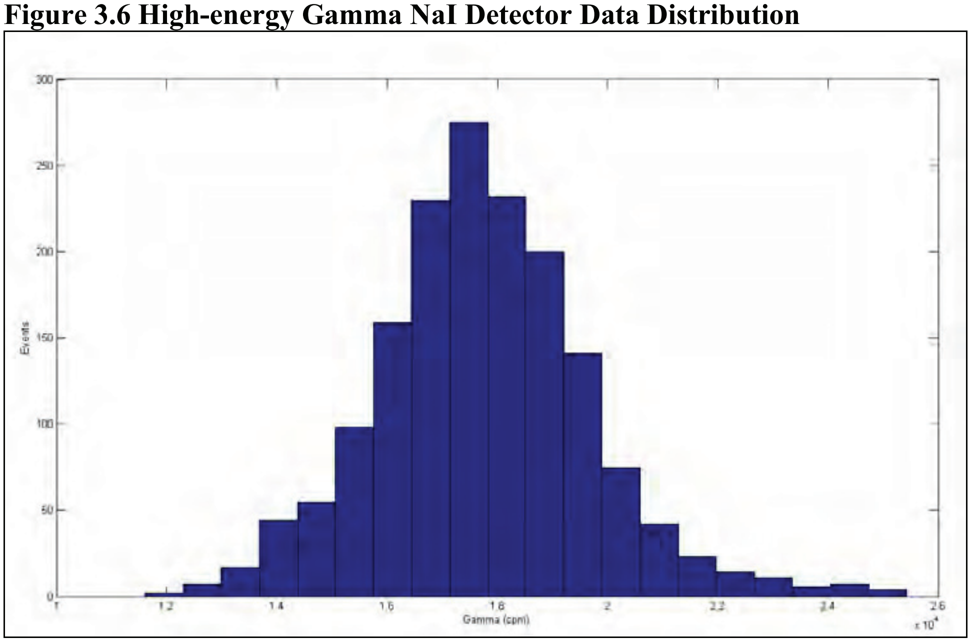


Figure 3.6 High-energy Gamma NaI Detector Data Distribution



The static high-energy and low-energy gamma statistics are shown in Table 3.6. The locations where measurements were made are the same as shown in Figure 3.2 above.

Table 3.6 Static High/Low Energy Gamma Detector Survey Results

Gamma Energy	Readings	Mean (cpm)	Standard Deviation (cpm)	Maximum Reading (cpm)	Minimum Reading (cpm)
FIDLER (low-energy)	24	19,825	2,212	25,403	15,736
NaI 44-10 (high-energy)	24	17,816	1,258	19,745	15,501

The scan survey data statistics for the FIDLER detector and NaI detector are shown below in Table 3.7. The distribution of data indicates no highly-elevated values with respect to the mean trench readings for either detector data set.

Table 3.7 Gamma Detector Survey Results

Detector	Readings	Mean (cpm)	Standard Deviation (cpm)	Maximum Reading (cpm)	Minimum Reading (cpm)
FIDLER (low-energy)	1,045	20,291	2,577	27,597	12,707
NaI 44-10 (high-energy)	1,642	17,736	1,952	25,428	11,608

4.0 Quality Control

All radiological instrumentation was calibrated within six months prior to use using NIST traceable sources and pulser. Field instruments were function checked before and after use each day. Function check forms and calibration sheets are included in Appendix A.

Appendix A

Calibration and Daily Function Check Forms

ERG

Function Check Form
Single Channel Detector

Ratemeter: LUDLUM 2221 Serial No. 268647 Cal. Due Date: 6/22/12

Detector: LUDLUM 44-10 Serial No. PR150786 Cal. Due Date: 6/22/12

Source: Cs-137 Activity: 5.37 μCi 1/13/10 Serial No. 4097-03

Comments: OPERATED w/ 10-FOOT C-CABLE. EQUIPMENT FUNCTION CHECKED & CAL'D @ ERG ALBUQUERQUE OFFICE. SOURCE DIST. ~ 5" SIDE.

Date	Time	Battery	High Voltage	Threshold	Gross Counts	Background	Net Counts	Efficiency	Initial
6/23/11	06:40	4.9	1150	102	68896	10362	58534	-	cf
6/23/11	16:30	4.9	1149	101	69656	9874	59782	-	CF
					*	12673			
					ON SITE	LANL	21-004(b)-99		
					PRE-OPERATIONAL		BACKGROUND		
					@ 18"	ABOVE	GROUND.		

Reviewed By: Date: 6/29/11

ERG Form 1.30A

ERG

Function Check Form
Dual Channel Detector

Ratemeter: LUDLUM 2360 | Serial No. 177184 | Cal. Due Date: 6/22/12

Detector: LUDLUM 43-93 | Serial No. PR199827 | Cal. Due Date: 6/22/12

Alpha Threshold: 120 mV | Beta Threshold: 4 mV | Beta Window: 30 mV

Alpha Source: TH-230 | Activity: 13,000 DPM | Serial No. 4098-03

Beta Source: Tc-99 | Activity: 17,700 DPM | Serial No. 4099-03

Comments: OPERATED w/ 10-FOOT C-CABLE. CAL/FUNCTION CHECK @ ERG ALBUQUERQUE OFFICE. SOURCE DIST. ~ CONTACT.

Date	Time	High Voltage	Battery	Alpha		Beta		Background		Efficiency		Initial
				Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	
6/23/11	07:00	✓	✓	2780	625	4	2641	7	209	0.213	0.137	CF
6/23/11	17:10	✓	✓	2613	611	8	2690	8	204	0.200	0.141	CF

* α: 29 β: 1944 5 min count
on site LANL 21-004(B)-99
Pre-operational background
at surface.

Reviewed By: [signature] Date: 6/29/11

ERG

Function Check Form
Single Channel Detector

Ratemeter: LUDLUM 2221 Serial No. 262328 Cal. Due Date: 6/22/12

Detector: ALPHASPECTRA 5" FIDLER Serial No. 010807C Cal. Due Date: 6/22/12

Source: Am-241 Activity: 1 μCi Serial No. ERG-SD1

Comments: OPERATED w/ 10-FOOT C-CABLE. FUNCTION CHECK & CAL @ ERG ALBUQUERQUE OFFICE. SOURCE DIST. ~ 2" BELOW FACE.

Date	Time	Battery	High Voltage	Threshold	Gross Counts	Background	Net Counts	Efficiency	Initial
6/23/11	06:45	6.0	1101	101	206539	11353	195186	–	cf
6/23/11	16:45	5.9	1099	99	205628	10952	194676	–	cf
					*	14374			
					ON SITE	LANL	21-004(b)-99		
					PRE-OPERATIONAL		BACKGROUND		
					@ ~ 6"	ABOVE	GROUND.		

Reviewed By: [signature] Date: 6/29/11

ERG Form 1.30A

Certificate of Calibration

Calibration and Voltage Plateau

Environmental Restoration Group, Inc.
8809 Washington St NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224
www.ERGoffice.com

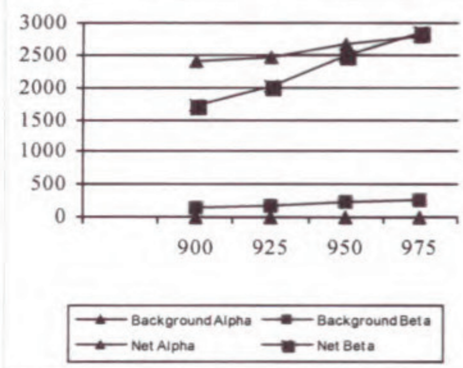
Meter:	Manufacturer:	Ludlum	Model Number:	2360	Serial Number:	177184
Detector:	Manufacturer:	Ludlum	Model Number:	43-93	Serial Number:	PR199827

☑ Mechanical Check ☑ Geotropism ☑ THR/WIN Operation ☑ Audio Check ☑ Battery Check (Min 4.4 VDC)
☐ F/S Response Check ☑ Meter Zeroed ☑ Reset Check HV Check (+/- 2.5%): ☑ 500 V ☑ 1000 V ☑ 1500 V
Source Distance: ☑ Contact ☐ 6 inches ☐ Other: Cable Length: ☐ 39-inch ☐ 72-inch ☑ Other: 10'
Source Geometry: ☐ Side ☑ Below ☐ Other: Temperature: 75 °F Relative Humidity 20 %
Alpha Threshold: 120 mV Beta Threshold: 4 Barometric Pressure: 24.57 inches Hg
Beta Window: 30 mV Instrument found within tolerance: ☑ Yes ☐ No

Range/Multiplier	Reference Setting	"As Found Reading"	Meter Reading	Integrated 1-Min. Count α	Integrated 1-Min. Count β
x 1000	400 Kcpm	400	400	399236	399167
x 1000	100 Kcpm	100	100		
x 100	40 Kcpm	400	400	39928	39927
x 100	10 Kcpm	100	100		
x 10	4 Kcpm	400	400	3993	3993
x 10	1 Kcpm	100	100		
x 1	400 cpm	400	400	399	399
x 1	100 cpm	100	100		

High Voltage	Alpha Source α	Alpha Source β	Beta Source α	Beta Source β	Background α	Background β
900	2422	401	7	1866	2	145
925	2477	517	7	2215	3	183
950	2670	575	7	2734	0	237
975	2795	788	9	3111	2	271

Voltage Plateau



Comments: HV Plateau Scaler Count Time = 1-min. Recommended HV =950

Reference Instruments and/or Sources:

Ludlum pulser serial number: ☐ 97743 ☑ 201932 Fluke multimeter serial number ☑ 8749012
☑ Alpha Source: Th-230 @ 13,000 dpm (1/13/10) sn: 4098-03 ☐ Gamma Source Cs-137 @ 5.37 uCi (1/13/10) sn: 4097-03
☑ Beta Source: Tc-99 @ 17,700 dpm (1/13/10) sn: 4099-03 ☐ Other Source:

Calibrated By: [signature] Calibration Date: 6-22-11 Calibration Due: 6-22-12

Reviewed By: [signature] Date: 6/22/11

Environmental Restoration Group, Inc.
8809 Washington St NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224
www.ERGoffice.com

ERG

Certificate of Calibration

Calibration and Voltage Plateau

Meter: Manufacturer: Ludlum Model Number: 2221r Serial Number: 268647

Detector: Manufacturer: Ludlum Model Number: 44-10 Serial Number: PR150786

☑ Mechanical Check ☑ Geotropism ☑ THR/WIN Operation ☑ Audio Check ☑ Battery Check (Min 4.4 VDC)

☑ F/S Response Check ☑ Meter Zeroed ☑ Reset Check HV Check (+/- 2.5%): ☑ 500 V ☑ 1000 V ☑ 1500 V

Source Distance: ☐ Contact ☑ 6 inches ☐ Other: Cable Length: ☐ 39-inch ☐ 72-inch ☑ Other: 10'

Source Geometry: ☑ Side ☐ Below ☐ Other: Temperature: 77 °F Relative Humidity 20 %

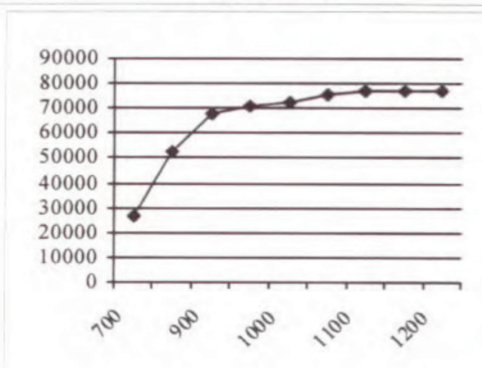
Threshold: 10 mV Window: Barometric Pressure: 24.54 inches Hg

Instrument found within tolerance: ☑ Yes ☐ No

Range/Multiplier	Reference Setting	"As Found Reading"	Meter Reading	Integrated 1-Min. Count	Log Scale Count
x 1000	400	400	400	399840	400
x 1000	100	100	100		100
x 100	40	400	400	39985	400
x 100	10	100	100		100
x 10	4	400	400	3999	400
x 10	1	100	100		100
x 1	400	400	400	400	400
x 1	100	100	100		100

High Voltage	Source Counts	Background
700	26979	
800	52792	
900	67942	
950	71158	
1000	72520	
1050	75628	
1100	76774	
1150	77337	11607
1200	77258	

Voltage Plateau



Comments: HV Plateau Scaler Count Time = 1-min. Recommended HV =1150

Reference Instruments and/or Sources:

Ludlum pulser serial number: ☐ 97743 ☑ 201932 Fluke multimeter serial number: ☐ 8749012

☐ Alpha Source: Th-230 @ 13,000 dpm (1/13/10) sn: 4098-03 ☑ Gamma Source Cs-137 @ 5.37 uCi (1/13/10) sn: 4097-03

☐ Beta Source: Tc-99 @ 17,700 dpm (1/13/10) sn: 4099-03 ☐ Other Source:

Calibrated By: [signature] Calibration Date: 6-22-11 Calibration Due: 6-22-11

Reviewed By: [signature] Review Date: 6/22/11

This calibration conforms to the requirements and acceptable calibration conditions of ANSI N323A - 1997.
NMRCB Registration No. 921-3 * Calibration of Radiation Detection Instrument Devices

ERG

Certificate of Calibration

Calibration and Voltage Plateau

Environmental Restoration Group, Inc.
8809 Washington St NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224
www.ERGoffice.com

	Manufacturer:		Model Number:		Serial Number:	
Meter:	Manufacturer:	Ludlum	Model Number:	2221r	Serial Number:	262328
Detector:	Manufacturer:	Alpha Spectra	Model Number:	FIDLER	Serial Number:	010807C

☑ Mechanical Check ☑ Geotropism ☑ THR/WIN Operation ☑ Audio Check ☑ Battery Check (Min 4.4 VDC)

☑ F/S Response Check ☑ Meter Zeroed ☑ Reset Check HV Check (+/- 2.5%): ☑ 500 V ☑ 1000 V ☑ 1500 V

Source Distance: ☐ Contact ☐ 6 inches ☑ Other: 3/4" Cable Length: ☐ 39-inch ☐ 72-inch ☑ Other: 10'

Source Geometry: ☐ Side ☑ Below ☐ Other: Temperature: 78 °F Relative Humidity 20 %

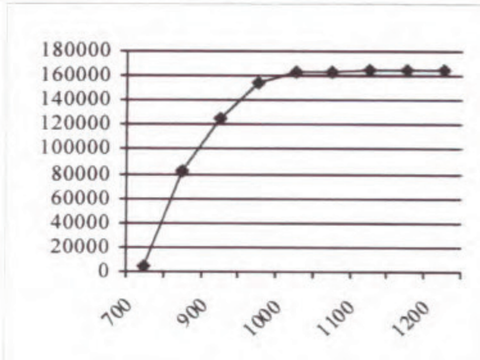
Threshold: 10 mV Window: Barometric Pressure: 24.6 inches Hg

Instrument found within tolerance: ☑ Yes ☐ No

Range/Multiplier	Reference Setting	"As Found Reading"	Meter Reading	Integrated 1-Min. Count	Log Scale Count
x 1000	400	400	400	398988	400
x 1000	100	100	100		100
x 100	40	400	400	39809	400
x 100	10	100	100		100
x 10	4	400	400	3992	400
x 10	1	100	100		100
x 1	400	400	400	399	400
x 1	100	100	100		100

High Voltage	Source Counts	Background
700	3935	
800	83122	
900	125781	
950	153460	
1000	163779	
1050	163974	
1100	164852	6647
1150	164979	
1200	165283	

Voltage Plateau



Comments: HV Plateau Scaler Count Time = 0.5-min. Recommended HV =1100

Reference Instruments and/or Sources:

Ludlum pulser serial number: ☐ 97743 ☑ 201932 Fluke multimeter serial number: ☐ 8749012

☐ Alpha Source: Th-230 @ 13,000 dpm (1/13/10) sn: 4098-03 ☐ Gamma Source Cs-137 @ 5.37 uCi (1/13/10) sn: 4097-03

☐ Beta Source: Tc-99 @ 17,700 dpm (1/13/10) sn: 4099-03 ☑ Other Source: Am-241 @ 1uCi

Calibrated By: [signature] Calibration Date: 6-22-11 Calibration Due: 6-22-12

Reviewed By: [signature] Review Date: 6/22/11

This calibration conforms to the requirements and acceptable calibration conditions of ANSI N323A - 1997.
NMRCB Registration No. 921-3 * Calibration of Radiation Detection Instrument Devices

Appendix E

Investigation-Derived Waste Management

E-1.0 INTRODUCTION

This appendix contains the waste management records for the investigation-derived waste (IDW) generated during the implementation of the investigation work plan for the DP Site Aggregate Area Delayed Sites and DP East building footprints at Technical Area 21 (TA-21) at Los Alamos National Laboratory (LANL or Laboratory).

All IDW generated during the field investigation was managed in accordance with Standard Operating Procedure (SOP) 5238, Characterization and Management of Environmental Program Waste. This procedure incorporates the requirements of applicable U.S. Environmental Protection Agency (EPA) and New Mexico Environment Department (NMED) regulations, U.S. Department of Energy orders, and Laboratory policies and procedures.

Consistent with Laboratory procedures, a waste characterization strategy form (WCSF) was prepared to address characterization approaches, on-site management, and final disposition options for wastes. Analytical data and information on wastes generated during previous investigations and/or acceptable knowledge were used to complete the WCSF. The WCSF is included in this appendix as Attachment E-1.

The selection of waste containers was based on appropriate U.S. Department of Transportation requirements, waste types, and estimated volumes of IDW to be generated. Immediately following containerization, each waste container was individually labeled with a unique identification number and with information regarding waste classification, contents, and radioactivity, if applicable.

Wastes were staged in clearly marked, appropriately constructed waste accumulation areas. Waste accumulation area postings, regulated storage duration, and inspection requirements were based on the type of IDW and its classification. Container and storage requirements were detailed in the WCSF and approved before waste was generated.

Investigation activities were conducted in a manner that minimized the generation of waste. Waste minimization was accomplished by implementing the most recent version of the “Los Alamos National Laboratory Hazardous Waste Minimization Report.”

E-2.0 WASTE STREAMS

The IDW streams generated and managed during the investigation are described below and are summarized in Table E-2.0-1. The waste numbers correspond with those identified in the WCSF.

- WCSF Waste Streams #1 and #2: Drill cuttings and excavated environmental media consisted of soil and rock removed during hand-augering and structure excavation. Approximately 2.5 yd^3 of these waste streams was generated during this investigation and stored in a 55-gal. drum. The wastes were characterized per the WCSF, met the criteria in ENV-RCRA-QP-11.2, Land Application of Drill Cuttings, and were land-applied.
- WCSF Waste Streams #3 and #5: Excavated man-made debris consisted of tanks, asphalt, concrete, piping, and a sump. Contact consisted of PPE, contaminated sampling supplies, and dry-decontamination waste. These wastes determined to be both industrial and low-level waste (LLW). Approximately 160 yd^3 of LLW and approximately 58 yd^3 of industrial waste were generated. These were stored in roll-off containers and disposed at an approved off-site facility.

- WCSF Waste Stream #9: Uncontainerized liquid consisted of fluids encountered inside the 3000-gal. aboveground storage tanks at Consolidated Unit 21-004(b)-99. This liquid was determined to be nonhazardous waste. The liquid waste was pumped from the tanks into two 400-gal. poly tanks and one 55-gal. drum (50% full). The waste was treated at TA-50 and disposed of at TA-53.
- WCSF Waste Streams #4, #6, #7, and #8: No decontamination fluids were generated, no municipal solid waste was generated, no petroleum-contaminated soils were found, and no excess samples were generated or returned.

Table E-2.0-1
Summary of IDW Generation and Management

Waste Stream	Waste Type	Volume	Characterization Method	On-Site Management	Disposition
Drill Cuttings and Excavated Environmental Media	Nonhazardous	2.5 yd^3	Direct container sampling.	55-gal. drum	Land-applied
Excavation Waste/Contact Waste	Industrial	58 yd^3	Direct container sampling.	20-yd^3 roll-off bins	Authorized off-site disposal facility
Excavation Waste	LLW	160 yd^3	Direct container sampling.	20-yd^3 roll-off bins/IP-1 container	Authorized off-site disposal facility
Liquid	Nonhazardous	825 gal.	Direct container sampling.	400-gal. poly tanks; 55-gal. drum	Treated at TA-50 and disposed of at TA-53

Attachment E-1

Waste Characterization Strategy Form

Environmental Programs (EP)
Document Signature Form

Document Catalog Number: EP2010-0549

(Please prefix the name of all electronic versions of this document with this number.)

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Reviewer Signatures: By signing below, the reviewer indicates that he/she **reviewed** and **approves** the document.

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Waste Characterization Strategy Form

Project Title	**TA-21 Delayed Sites**
Solid Waste Management Unit	**SWMU's and AOCs Located within MDAT but Outside of the NES Area Boundary, Consolidated Unit 21-022(b)-99, SWMU 21-011(b)**
Activity Type	**Site Investigation**
LATA Field Team Leader	**Saul Alanis**
Waste Management Coordinator	**Ron Desotel**
Completed by	**Kim Oman**
Date	**12/14/2010**

1.0 Description of Activity

The objectives of the proposed investigation activities are removal of inactive structures related to the sites and collect confirmation samples and to define the lateral and vertical extent of contaminants below previously removed structures at DP East and West. The work will be performed in accordance with Investigation Work Plan for Delta Prime Site Aggregate Area Delayed Sites, EP2009-0434. Trained and qualified Subcontractor Field Waste Management Technician(s) (FWMT), Waste Sampling Personnel (SP), and Hazardous Materials Packaging and Transportation (HMPT) personnel will be assigned to perform the duties outlined in EP-SOP-5238, *Characterization and Management of Environmental Program Waste.*

This waste characterization strategy form (WCSF) describes the management of investigation-derived waste (IDW) and deactivation and decommissioning (D&D) waste which are expected to be generated during the investigation in Technical Area (TA)-21. The IDW and D&D waste may include, but are not limited to, drill cuttings, excavated environmental media, excavated man-made debris, contact waste, decontamination fluids, municipal solid waste, petroleum-contaminated soils, returned or excess samples and un-containerized liquid wastes.

The following activities are planned:

1) <u>All Activities</u>— Includes all hazards, controls, reference documents, and training that are consistent for all activities.
2) <u>Geodetic Survey</u>— This task involves surveying the former disposal units and sampling locations using a hand held GPS unit and/or Total Station unit
3) <u>Mobilization/Demobilization of Equipment</u> – This step will involve delivery of support equipment to the site.
4) <u>Site Preparation</u> – This task will involve the deployment of the heavy equipment and support equipment at each excavation location, establishing HAZWOPER zones (Support Zone (SZ), Contamination Reduction Zones (CRZ), and Exclusion Zone (EZ), and all postings and barriers which will be utilized to control access to the site.
5) <u>Field Screening</u>—This task includes radiological and organic vapor screening of site locations, structures, excavated soils, materials, and field samples.
6) <u>Heavy Equipment Operation</u>—This task includes the use of heavy equipment as required.
7) <u>Excavation/Trenching</u>—This task includes the removal of soil overlying the piping and structures to be removed from the site.
8) <u>Pipe Cutting</u>—This task involves the breaching of pipes for stabilization or removal.
9) <u>Fluid/Sludge Stabilization</u>—This task includes the introduction of stabilizing materials into the components being removed to minimize the potential for dispersal of the contents.

10) Demolition—This task involves razing foundations and associated structural features.
11) Tank/Piping/Sump Removal—This task involves removal of the structures for disposal.
12) Collecting Soil and Tuff Samples—This task involves collecting soil or tuff samples using either a hand auger or an auger drill rig.
13) Using Hand Auger to Collect Soil and Tuff Samples—This task includes collecting samples using a hand auger.
14) Using Auger Drill Rig to Collect Soil and Tuff Samples—This task involves collecting samples using a powered auger drill rig.
15) Borehole Abandonment—This task involves sealing boreholes with grout where required.
16) Decontamination—This task includes the removal of contamination from personnel or equipment.
17) Waste Management –This task involves the management of investigation-derived (IDW) and deactivation and decommissioning (D&D) waste in accordance with this waste characteristic strategy form (WCSF) and all applicable procedures, including but not limited to SOP-5238, Characterization and Management of Environmental Program Waste; P930-1, LANL Waste Acceptance Criteria; P930-2, Waste Certification Program; and P-409, Waste Management. The IDW and D&D wastes may include, but are not limited to, excavated man made debris, excavated environmental media, drill cuttings, contact waste, sampling supplies, decontamination fluids, petroleum-contaminated soils, un-containerized liquid waste, and all other waste that has potentially come into contact with contaminants.
18) Site restoration –This activity involves the restoration of sites to pre-investigation conditions to the degree practicable. This may involve patching concrete or asphalt pavement, land application of cuttings, or seeding or planting vegetation.

2.0 Relevant Site History and Description

TA-21 is located on DP Mesa on the northern boundary of the Laboratory and is immediately east-southeast of the Los Alamos townsite. It extends from the mesa top to the stream channels in two adjacent canyons, DP Canyon to the north and Los Alamos Canyon to the south.

During World War II, the Laboratory was established for the research, development, and testing of the first deliverable nuclear weapon. In 1945, the operations for establishing the chemical and metallurgical properties of the nuclear material necessary to achieve and sustain the nuclear fission reaction were transferred to newly built facilities at TA-21.

DP West operations began in September 1945, primarily to produce metal and alloys of plutonium from the nitrate solution feedstock provided by other production facilities. This procedure involved several acid dissolution and chemical precipitation steps to separate the plutonium and other valuable actinides from the feedstock. A major research objective at DP West was the development of new purification techniques that would increase the efficiency of the separation processes. Details of the purification techniques are discussed in the operable unit work plan for TA-21. Other operations performed at DP West included nuclear fuel reprocessing. In 1977, a transfer of work to the new plutonium facility at TA-55 began, and much of the DP West complex was vacated.

DP East operations also began in September 1945. These facilities were used to process polonium and actinium and to produce initiators (a nuclear weapons component). In 1964, building 21-209 was built to house research into high-temperature and actinide chemistry. Building 21-155 housed the TSTA for developing and demonstrating effective technology for handling and processing deuterium and tritium fuels used in fusion reactors.

TA-21 includes five MDAs: A, B, T, U, and V (Figure 1.0-1). Process wastes, transuranic (TRU) wastes, and liquid wastes were disposed of at the MDAs from the early 1940s until the late 1970s. Details of the disposal methods are presented in the TA-21 operable unit work plan. The major contributors to waste streams at TA-21 were plutonium-processing activities. Numerous other chemicals were used for separation techniques and were present in the waste stream. Airborne emissions, including tritium, were released from some of the buildings at DP West and DP East; these releases are also discussed in the TA-21 operable unit work plan.

Consolidated Unit 21-004(b)-99 Waste Lines, Outfall, and Overflow Holding Tanks Background

Consolidated Unit 21-004(b)-99 (Figure 4.1-1) consists of SWMU 21-004(b), SWMU 21-004(c), and AOC 21-004(d). SWMUs 21-004(b) and (c) are two aboveground stainless steel tanks that were installed in 1979. They were used as overflow holding tanks for liquid waste from cooling towers, and Laboratory and radionuclide experimental operations in the TSTA facility (building 21-155). Each tank is 9 ft high and 8 ft in diameter and has a capacity of 3000 gallons. Both tanks are currently mounted on steel legs above the surface of an asphalt bermed area. The bermed area has a capacity of approximately 9600 gal. and measures 36 ft long by 18 ft wide. The drain line connected to these tanks, as well as an outfall area that was present in 1965 before the tanks were installed, comprises AOC 21-004(d). The tanks were connected to the existing vitrified clay outfall pipe and concrete headwall (a small retaining wall placed at the outlet of a stormwater pipe or culvert) by an aboveground 6-in. galvanized pipe that connects to the top of the tanks. The former outfall discharge area was located where the concrete headwall is situated today

SWMU 21-011 (B), Acid Waste Sump and Lines

SWMU 21-011(b) is an acid waste sump (structure 21-223) located approximately 760 ft east of the TA-21 waste treatment plant (building 21-257) and 70 ft northwest of the TSTA (building 21-155).
The sump is located inside a small metal building (no structure number assigned). In 1965, 4-in. piping was installed to transport acid waste from building 21-155 to the sump (structure 21-223).
From the sump, a 3-in. waste line transported acid waste to the old waste treatment plant/laboratory (building 21-035). The sump also connected to a 6-in. vitrified clay overflow pipe, which discharged to DP Canyon, eventually running into the same area as the discharge from the SWMU 21-024(h) septic system. The SWMU 21-024(h) outfall was addressed in the DP Site Phase I and II investigations.

In 1967/1968, the old waste treatment plant/laboratory (building 21-035) was removed and the sump outlet line was extended to the new waste treatment plant (building 21-257). In 1979, the sump overflow pipe was connected to the aboveground stainless steel storage tanks [structure 21-346, Consolidated Unit 21-004(b)-99] In the mid- to late-1980s, two new 4-in. acid waste steel or iron lines were connected from building 21-155 to manhole 21-221.

Consolidated Unit 21-022 (b)-99, Industrial Waste Lines and Sumps

Consolidated Unit 21-022(b)-99 consists of SWMUs 21-022(b), 21-022(c), 21-022(d), 21-022(e), and 21-022(g). These SWMUs are industrial waste lines and associated underground liquid waste sumps; structure 21-082 [SWMU 21-022(b)], structure 21-084 [SWMU 21-022(c)], structure 21-087 [SWMU 21-022(d)], structure 21-089 [SWMU 21-022(e)], and structure 21-189 [SWMU 21-022(g)].

Structures 21-082, 21-084, 21-087, and 21-089 [SWMUs 21-022(b)-(e)] were located adjacent to the northeast corners of buildings 21-002, 21-003, 21-004, and 21-005, respectively. These brick and concrete sumps were constructed in 1945 and were approximately 5 ft, 4 in. in diameter and 10 ft deep.

Construction drawings show a 2-ft-diameter, 5-ft-deep steel catch basin within each sump. The sumps received all of the liquid waste discharges, including the floor drains, janitor sinks, and chilled water overflows, from their respective buildings and subsequently flowed through the industrial waste lines to MDA T for disposal. The pipeline connecting the sumps to the buildings was constructed of 6-in. cast iron or steel).

In 1952, the waste treatment plant/laboratory (building 21-035) was constructed at MDA T. A 4-in. extra heavy cast iron (EHCI) waste line was installed north of the old 6-in. iron pipe (which was left in place). The sumps were connected to the new line through 4-in. EHCI pipes; the 6-in. connections were removed. Buildings 21-002, 21-003, and 21-005 had additional 1.5-in. stainless steel raffinate waste (liquid remaining after extraction) lines or citrate waste lines that connected directly to the waste treatment plant/laboratory (building 21-035). In 1963, plastic liners were placed inside and grouted to the walls of structures 21-082, 21-084, 21-087, and 21-089. In the late 1960s, building 21-035 was removed and all 4-in. and 1.5-in. waste lines were extended to the new waste treatment plant building 21-257.

In the early 1960s, a sump [structure 21-189, SWMU 21-022(g)] was constructed of concrete with dimensions of 5 ft, 4 in. in diameter and 12 ft deep. It was located off the northwest corner of building 21-150, the plutonium fuel service and development building, which housed plutonium fuels development activities. The sump was connected to the plutonium fuel storage building and the waste treatment plant/laboratory (21-035) by 4-in. EHCI pipes. This line was extended to building 21-257 when building 21-035 was removed in 1968.

In 1979 and 1980, all five sumps (structures 21-082, 21-084, 21-087, 21-089, and 21-189) were excavated and removed and disposed of at TA-54. Contaminated soil was removed around the sumps until further excavation jeopardized the buildings. Some of the removed soil had retrievable levels of plutonium. The removal of additional soil was deferred to a later date when the buildings or waste lines were decommissioned. All excavated surfaces were sprayed with asphalt undercoating and backfilled with clean soil. The radioactive contamination remaining on the walls and bottoms of the excavation areas was monitored using a zinc sulfide (ZnS) alpha scintillator. The depths of the excavation at all five sump locations were approximately 14 to 16 ft bgs.

In the late 1980s, a work order was issued to replace the industrial waste lines in the utility tunnels around the inside perimeter of buildings 21-003 and 21-004. The work was started at building 21-004 in 1988 and ended in 1989. Sludge accounted for 50% of the volume of the pipe and was treated as TRU waste. The waste lines associated with building 21-003 were not replaced. Around this same time, an asbestos survey was completed in the pipe tunnels of buildings 21-003 and 21-004. Asbestos covered some of the piping and was found to have fallen on the pipe tunnel floors.

In the early to mid 1990s, dye tests were performed to identify all drains from the buildings and structures at TA-21 and to determine where they terminated. A series of dye tests were performed in buildings 21-003 and 21-004. Dye testing at building 21-004 was successful; all dye reached the expected destination. Dye was not reaching building 21-257, the waste treatment plant, from building 21-003. Camera equipment was placed into the piping in building 21-003 at the northeast corner of the building; the piping contained standing water, which appeared to be from a leak or plug in the piping. NMED was notified of the situation on November 30, 1994. Following, NMED requested a Corrective Action Report. In response, the Laboratory submitted a National Pollutant Discharge Elimination System Permit Release Notification Form, stating a discharge had not been identified and was being reported as a potential concern. The release notification summarized the dye test findings and summarized that there was no indication that liquid had escaped into the environment. A critique of the findings was conducted on December 1, 1994. It was decided to report this incident as an off-normal potential concern pending further investigation.

In the early to late 1990s, the north and south ends of buildings 21-003 and 21-004 were removed. Buildings 21-002, 21-005, and 21-150 are still present, as well as the hallways connecting these buildings.

<u>SWMU's and AOCs Located within MDA T but Outside of the NES Area Boundary</u>

These SWMUs/AOCs include former building 21-035 and other structures associated with this building:

- SWMU 21-010(a), building 21-035, was an industrial liquid waste treatment facility used for treating and disposing of contaminated liquid waste from plutonium and uranium-processing laboratories at DP Site beginning in 1952 and removed in 1968;
- SWMU 21-010(b), structure 21-093, was initially a water manhole that was changed to an acid valve pit manhole, located on the southwest corner of building 21-035, and likely removed in 1968;
- SWMU 21-010(c), structure 21-145, was a steel 500-gal. underground process tank located near the southwest corner of building 21-035 and likely removed in 1968;
- SWMU 21-010(d), structure 21-147, was a steel 500-gal. underground process tank located near the southwest corner of building 21-035 and likely removed in 1968;
- SWMU 21-010(e), structure 21-185, was a 390-gal. sanitary waste septic tank and leach field located on the northeast corner of building 21-035; the septic tank was likely removed in 1968; it is unknown if the leach field is still present;
- SWMU 21-010(f), structure 21-192, was a grit chamber located at the northeast corner of building 21-035 and removed in 1968;
- SWMU 21-010(g), structure 21-255, was a 2000-gal. aboveground process tank located at the southwest corner of building 21-035 and removed in 1968;
- SWMU 21-010(h), structure 21-271, was a process manhole located at the southwest corner of building 21-035 and likely removed in 1968;
- AOC C-21-002 was a radionuclide leak from a waste storage tank to the surrounding soil near building 21-035;
- AOC C-21-010 was a radiation leak at building 21-035;
- AOC C-21-028(a) was an inactive satellite storage area utilized for the storage of acetone and Freon. Location of the site is unknown. The SWMU report identifies this site as structure 21-121 near loading docks. The Rogers report indicates 21-121 is the location of the distribution box between Absorption Beds 1 and 2 at MDA T;
- AOC C-21-034, structure 21-091, was a 1000-gal. raffinate holding tank with a manhole located at the southwest corner of building 21-035 and likely removed in 1961 (LANL 1983, 035510);
- AOC C-21-035, structure 21-110, was the former location of an aboveground process water holding tank on the south side of building 21-035 and now located near building 21-257;
- AOC C-21-036, structure 21-111, was the former location of an aboveground process water holding tank on the south side of building 21-035 and now located near building 21-257;
- AOC C-21-037, structure 21-256, was the former location of a 2000-gal. aboveground process tank located at the southwest corner of building 21-035 and now located near building 21-257;
- A 6-in. cast-iron drain pipe from former building 21-012, which discharged into the west side of MDA T, and was removed in 1973.

Building 21-012, the old plutonium filter facility, removed in 1973, was connected to the west side of MDA T through a 6-in. cast iron pipe used as a drain pipe from the precipitron and filter area of the building (Christensen et al. 1975, 005481).

3.0 Characterization Strategy

This WCSF identifies the types of wastes expected, based on historical site information and Investigation Work Plan for Delta Prime Site Aggregate Area Delayed Sites; LA-UR-09-6108 Appendix B, Management Plan for Investigation-Derived Waste. However, other types of wastes may be encountered and an amendment to this strategy form will be prepared and submitted for review and approval if any of the waste streams change in description or characterization approach or a new waste stream is generated. All IDW will be managed in accordance with Los Alamos National Laboratory (LANL) Standard Operating Procedure (SOP) 5238, *Characterization and Management of Environmental Program 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 and deactivation and decommissioning (D&D) waste to be generated. Immediately following containerization, each waste container will be individually labeled with a unique identification number and with information such as waste classification, contents, radioactivity, and date generated, if applicable. Waste streams with the same regulatory classification that are destined for the same receiving facility may be combined into a single container for disposal (e.g. contact waste with drill cuttings).

IDW characterization will be completed using investigation sampling data or by direct sampling of the IDW. If the waste is directly sampled, it will be sampled within 10 days of generation, and a 21 day turnaround time for analyses will be requested unless the waste is stored in a Satellite Accumulation Area (SAA) or Area of Contamination where samples will be collected within the time frame needed to expedite waste dispositioning before project completion. Deactivation and decommissioning (D&D) waste will be characterized using Acceptable Knowledge, whenever possible. However, if there is insufficient AK for waste characterization, direct sampling may be required. The waste will be sampled within 10 days of generation. Turnaround times for D&D waste will be determined by the type of waste being sampled, with a maximum turnaround time of 21 days. Samples for IWD and D&D wastes must be collected using the methods described in this WCSF by trained and qualified sampling personnel. Sampling personnel must record waste sampling information in accordance with LANL's procedure, EP-ERSS-SOP-5058, Sample Control and Field Documentation and EP-ERSS-SOP-5181, Documentation of Waste and Environmental Technical Field Activities.

A waste determination will be made within 45 days of the generation date of waste unless the waste is stored in a Satellite Accumulation Area or an approved Area of Contamination. A Waste Acceptance Criteria (WAC) exception form (WEF) can be used if the generator does not meet the 45 day deadline. The generation of no path forward wastes must be approved by Department of Energy (DOE) prior to generation of the waste; however, no such wastes are anticipated for this project.

If documentation exist that the contaminant(s) originated from a listed source but the levels are below residential screening levels and the land disposal restriction treatment standards, a "contained-in" request may be submitted to the New Mexico Environment Department (NMED), who may approve removing the listings from the waste stream. A request to submit a "contained-in" determination to NMED must be submitted to Environmental Protection (ENV-RCRA) through the Subcontract Technical Representative (STR) within 70 days of generating the waste. A copy of the due diligence reviews already prepared for this investigation or the NMED "contained-in" approval letter should accompany all waste profiles prepared for the waste(s) with potentially listed contaminants.

Investigation and deactivation and decommissioning 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". Waste streams will be recycled/reused, as appropriate.

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

If low levels of listed hazardous waste are identified, a "contained in" determination may be submitted for approval to NMED. Data currently available for the sites addressed in this WCSF do not identify polychlorinated biphenyl (PCB) concentrations greater than 1 mg/kg. Considerable material will be excavated during the remediation of:

- Consolidated Unit 21-004(b)-99, structure 21-346, aboveground overflow holding tanks [Solid Waste Management Units (SWMUs) 21-004(b and c)], waste line, and outfall Area [area of Concern, (AOC) 21-004(d)],
- SWMU 21-011(b), structure 21-223, acid waste sump and lines originating at DP East and terminating at Material Disposal Area (MDA) T,
- Consolidated Unit 21-022(b)-99, structures 21-082, 21-084, 21-087, 21-089, and 21-189, removed waste sumps [SWMUs 21-022(b)-(e) & (g)] and industrial waste lines originating in DP West buildings 21-002, 21-003, 21-004, 21-005, and 21-150 and terminating at MDA T; and
- MDA T outside of the nuclear environmental site (NES) boundary.

To facilitate the staging and segregation of the remediation waste, the Laboratory will submit area of contamination designation requests for the consolidated units, SWMUs, AOCs, and MDA T outside of the NES boundary to NMED for approval. The request will specify the boundaries of the proposed areas of contamination and will describe the activities to be conducted within the boundaries.

Wastes will be containerized and placed in clearly marked and appropriately constructed waste accumulation areas. Waste accumulation area postings, regulated storage duration, and inspection requirements will be based on the type of waste and its classification. Container and storage requirements will be detailed in the WCSF and approved before the waste is generated.

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

Waste # 1: Drill Cuttings (IDW)

This waste stream consists of soil and tuff/rock chips generated by the drilling of boreholes for the intent of sampling. Drill cuttings include excess core sample not submitted for analysis and any returned samples sent for analysis. Drill cuttings may be land applied if they meet the criteria in Quality Procedure (QP)-011, *Land Application of Drill Cuttings.* Approximately 20 yd^3 of drill cuttings are expected to be generated.

Anticipated Regulatory Status: Industrial, Hazardous, Low-level radioactive waste (LLW), Mixed low-level radioactive waste (MLLW), New Mexico Special Waste (NMSW) Asbestos Containing Material, Land Applied, TSCA, TRU

Characterization Approach: The drill cuttings will be characterized by direct sampling of the containerized cuttings. Cuttings not generated within an Area of Contamination will be sampled within 10 days of generation and submitted for analysis with a 21 day turnaround time. Drill cuttings from a single potential release site (PRS) may be combined into a single container before sampling. If container sizes are small, a representative sample may be collected from more than one container (e.g., one sample for every 20 cy^3 generated from a single potential release site). A hand auger or thin-wall tube sampler will be used in accordance with LANL SOP-06.10, *Hand Auger and Thin-Wall Tube Sampler,* to collect waste material from each container, augering from the surface to the bottom of the waste in a sufficient number of locations to obtain a representative sample. To meet the requirements of the investigation work plan, drill cuttings will be analyzed for isotopic radionuclides, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), explosive compounds (if site sampling indicates the presence of high explosives), radionuclides, total metals, and if needed, toxicity characteristic metals. Asbestos will be analyzed for in soil/tuff generated by drilling under the former pipe tunnels at former buildings 21-003 and 21-004. If process knowledge, odors, or staining indicate the cuttings may be contaminated with petroleum products, the materials will be analyzed for total petroleum hydrocarbons (TPH [DRO/GRO]) and polychlorinated biphenyls (PCBs). Other constituents may be analyzed as necessary to meet the WAC for a receiving facility. A final waste determination will be made using the automated waste determination tool (AWD) in accordance with SOP 5238, *Characterization and Management of Environmental Program Waste*. Each borehole location will use a different sampling event number to simplify AWD evaluations.

Storage and Disposal Method: Drill cuttings will be containerized in the appropriate sized DOT approved containers at the point of generation. If drilling is conducted within the boundary of an area of contamination (AOC), the drill cuttings will be managed within those boundaries. If drilling occurs outside the area of contamination boundaries, the initial management of the cuttings will rely on the data from previous investigations and/or acceptable process knowledge. Drill cuttings will be managed in secure, designated areas appropriate to the type of the waste. Most cuttings are expected to be land applied or disposed as low-level waste (LLW) at the appropriate disposal facility. Cuttings may be land applied if they meet the criteria of the NMED-approved NOI decision tree for land application. Land application will be conducted in accordance with ENV-RCRA-QP-011, *Land Application of Drill Cuttings*. Drill cuttings that cannot be land applied will be used as attic cover at TA-54 or treated and/or disposed of at authorized off-site facilities appropriate for the waste classification. If screening indicates transuranic (TRU) levels of contamination, the work will be stopped, TA-21 Operations and DOE notified, and an evaluation of how to proceed will be developed.

Waste # 2: Excavated Environmental Media

This waste stream consists of layback and overburden spoils (including environmental media mixed with buried debris) and will consist of soil and tuff removed from within or adjacent to (e.g., from benching to stabilize a trench) the sites to be excavated. Approximately 600 yd^3 of excavated environmental media are expected to be generated.

Anticipated Regulatory Status: Industrial, Hazardous, LLW, MLLW, Asbestos Containing Material, TSCA, TRU, Fill

Characterization Approach: Per the IWP, this material will be field screened for radioactivity and organic vapors during the excavation process. If field screening indicates the potential for contamination, the layback and overburden spoils will be placed in roll-off bins or other suitable containers. The spoils will remain within the area of contamination boundary of the consolidated unit or SWMU from which spoils were excavated, awaiting analytical results. Samples of the spoils will be collected as the spoils are excavated and composited, if appropriate (one composite sample for every 20 to 50 yd^3, depending on the homogeneity of spoils). The samples will be analyzed for VOCs, target analyte list (TAL) metals, radionuclides, and toxicity characteristic metals, as needed. Other constituents may be analyzed as necessary to meet the WAC for a receiving facility. If process knowledge, odors, or staining indicate the soils may be contaminated with petroleum products, the materials will also be analyzed for total petroleum hydrocarbons (TPH) and PCBs. A final waste determination will be made using the automated waste determination tool (AWD) in accordance with SOP 5238, *Characterization and Management of Environmental Program Waste*. Each borehole location will use a different sampling event number to simplify AWD evaluations.

Storage and Disposal Method: If contamination is not detected during screening, the spoils will be stored either in roll-off bins, other suitable containers, or on the ground surface with appropriate best management practices. If the spoils are determined to be suitable for reuse (i.e., is not hazardous waste and meets residential soil screening levels [SSLs] or screening action levels [SALs]), the evacuated environmental media will be segregated from any man-made debris, and the soil will be used to backfill the excavations. If the spoils do not meet residential SSLs/SALs or are determined to be hazardous waste, they will be treated/disposed of at an authorized facility appropriate for the waste regulatory classification. If screening indicates TRU levels of contamination, the work will be stopped, NMED notified, and an evaluation of how to proceed will be developed.

Waste #3: Excavated Man-Made Debris - Excavated man-made debris will be generated from the removal of pipelines, a sump, aboveground storage tanks, concrete, asphalt, and any other encountered buried structures. This waste stream will consist of metal and polyethylene tanks, piping, (e.g., stainless steel, clay, iron, Orangeburg, duriron, etc.), concrete, acid waste sump components and lines, contaminated soil and/or asphalt. Approximately 400 yd^3 of excavated man-made debris are expected to be generated.

Anticipated Regulatory Status: Industrial, Hazardous, LLW, MLLW, Asbestos Containing Material, TRU, TSCA

Characterization Approach: The excavated materials will be placed initially in containers (e.g., roll-off bins) within the boundaries of an area of contamination (AOC). Debris will be segregated as it is excavated, to the extent practical, based on factors such as the type and size of debris, field screening, process knowledge, and/or staining or odors. Where practicable, this waste stream will be characterized utilizing acceptable knowledge or, if required, by direct sampling of the waste (e.g., concrete). Direct samples will be analyzed for VOCs, SVOCs, explosive compounds, radionuclides, total metals, and, if needed, toxicity characteristic metals. Other constituents may be analyzed as necessary to meet the WAC for a receiving facility or if process knowledge or visual observations indicate other contaminants may be present (e.g., PCBs or asbestos). For debris that is difficult to characterize; acceptable knowledge (AK) will be used whenever possible, supplemented by sampling as needed. Sampling methods will often have to be identified on a case-by-case basis by qualified sampling personnel and all decisions documented in the field activity notebook. If the project anticipates finding ACM a NOI must be submitted to NMED 10 days before the start of the project with the assistance of ENV-EAQ.

Storage and Disposal Method: Debris will be containerized at the point of generation in appropriately sized DOT approved containers. Any debris that leaks as it is excavated must immediately be placed in an area with secondary contamination. The debris will initially be managed within the Area of Contamination. If analytical data changes the waste classification or the waste is hazardous and is moved outside the Area of Contamination, the waste will be stored in an area appropriate for the type of waste. The waste will be treated and/or disposed of at an authorized off-site facility appropriate for the waste classification. If screening indicates TRU levels of contamination, the work will be stopped, TA-21 Operations and DOE notified, and an evaluation of how to proceed will be developed.

Waste #4: Decontamination Fluids (potential) - The decontamination fluids waste stream will consist of liquid wastes generated from decontamination of excavation, sampling and drilling equipment. 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 appropriate containers at the point of generation. Less than 55 gal of decontamination fluids are expected to be generated.

Anticipated Regulatory Status: Industrial, Sanitary, Hazardous, LLW, MLLW, TSCA

Characterization Approach: All drilling equipment and tooling will be steam-cleaned by the drilling subcontractor prior to arriving onsite. If tooling appears unclean or odors are detected, the equipment must be steam-clean onsite in accordance with EP-ERSS-SOP-5061, Field Decontamination of Equipment or an approved equivalent procedure. The rinsate must be separately collected and sampled (do not mix with any other decontamination fluids).

Decontamination fluids will be characterized by investigation samples from the media they contacted or by direct sampling. Samples will be collected from the storage container in accordance with LANL SOP-

06.15, *COLIWASA Sampler for Liquids and Slurries*. If the container does not permit COLIWASA or bailer sampling, the type of sampling equipment used will be appropriate for the waste container and properly operated in accordance with Chapter 7 and Appendix E of the *RCRA Waste Sampling Draft Technical Guidance* (EPA 530-D-02-002, August 2002, http://www.epa.gov/osw/hazard/testmethods/sw846/pdfs/rwsdtg.pdf). Samples will be analyzed for VOCs, SVOCs, radionuclides, and total metals, High explosives will be analyzed only if the work plan requires analysis of these contaminants in investigation samples for the potential release site. Other constituents may be analyzed as necessary to meet the WAC for a receiving facility. If wastes will be treated on-site at the Sanitary Waste Water System (SWWS) or the Radioactive Liquid Waste Treatment Facility (RLWTF), submit a sampling request to http://esp-esh-as01-f5.lanl.gov/~esh19/database/rfa_form.shtml for additional constituents identified in Characterization Table, footnote 1. If the fluids cannot be treated on-site, they may be solidified for disposal off-site. The Material Safety Data Sheet (MSDS) for any absorbent used for solidification will be used as AK for waste characterization.

Storage and Disposal Method: Decontamination fluids will be collected in appropriate containers at the point of generation and initially managed in secure, designated non-hazardous waste area in accordance with Table 1. If analytical data changes the waste classification, the waste will be stored in an area appropriate for the type of waste. It is expected that the decontamination fluids will be treated on-site at the TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF), or the Sanitary Waste Water System (SWWS). Decontamination wastes not meeting the WAC for on-site facilities will be treated and/or disposed of in authorized off-site treatment/disposal facilities. If solidification of decontamination fluids is required for transportation or disposal, it may be solidified using an approved absorbent. Solidification activities must be reviewed by the ENV-RCRA before being conducted.

Waste # 5: Contact Waste - This waste stream includes personnel protective equipment (PPE), contaminated sampling supplies, and dry decontamination waste that may have come in contact with contaminated environmental media or man-made debris and cannot be decontaminated. This includes, but is not limited to plastic sheeting (e.g., tarps and liners), gloves, coveralls, booties, paper towels, plastic and glass sample bottles, and disposable sampling supplies. Approximately 5 yd^3 of drill cuttings are expected to be generated.

Anticipated Regulatory Status: Industrial, Hazardous, LLW, MLLW

Characterization Approach: Contact waste will be characterized using AK based on data from the media with which they came into contact, as follows:

- If generated during drilling, data from the associated drill cuttings will be used.
- If generated during hand augering, associated investigation sample data will be used.
- If generated during excavations, data from the associated excavated environmental media will be used.
- If generated during excavation of man-made debris, acceptable knowledge and/or data (if available) from the associated debris will be used.

All contact waste will be inspected before being placed in containers to determine if environmental media or staining is present, indicating contamination. If staining is present, an estimate of the portion or percentage of the item stained will be recorded. Results from the analytical data will be weighted by the extent of contamination for determining whether wastes are characteristic. If the material with which the contact waste came into contact is listed, the contact waste will be assumed to be listed unless a "contained-in" approval is obtained.

Storage and Disposal Method: The contact waste may be separately containerized or it may be placed into the same containers as the media with which it is contaminated if the media will not be land applied. The waste will initially be managed in secure, designated areas within an Area of Contamination. If analytical data changes the waste classification or if hazardous waste is moved outside the boundaries of the Area of Contamination, the waste will be stored in an area appropriate for the type of waste. For disposal, separately containerized contact waste may also be combined with the material that it contacted (the WPF will document the decision to combine the waste streams). Wastes will be treated and/or disposed of in authorized off-site facilities appropriate for the waste classification.

Waste #6: 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 wastes which are derived from project activities. It is estimated that less than one yd^3 of MSW will be generated.

Anticipated Regulatory Status: MSW

Characterization Approach: MSW will be characterized based on acceptable knowledge (AK) of the waste materials (including MSDS) and methods of generation.

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 Transfer Station or other authorized solid waste landfill.

Waste #7: Petroleum Contaminated Soils (PCS), (potential) - PCS may be generated from releases of 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 or filling equipment) onto soil. PCS created by legacy contamination may also be encountered during investigations. Absorbent padding, paper towels, spill pillows or other absorbent material used to contain the released material may be added to the PCS waste for storage and disposal. It is estimated that less than one cubic yard of PCS will be generated.

Anticipated Regulatory Status: NMSW, Industrial, Hazardous, LLW, MLLW, PCB

Characterization Approach: The contaminated soil may either be sampled in-place (by gridding the spill location and collecting and combining incremental samples into one sample) or after containerization in accordance with LANL SOP-06.10, Hand Auger and Thin-Wall Tube Sampler. If the spill is shallow (in-place sampling) or containers are small, Spade and Scoop Method for Collection of Soil Samples (LANL SOP-06.11) may also be appropriate. If the spill is new, it must be immediately reported to ENV-RCRA and the contaminated material must be containerized the same day it is spilled unless permission is received from ENV-RCRA to leave it longer (generally only granted for large spills). Representative samples will be analyzed at a minimum for VOCs, SVOCs, TPH (DRO/GRO), and total metals. Herbicides and pesticides will be analyzed only if the work plan requires analysis of these contaminants for investigation samples. High explosives (HE), perchlorates, nitrate, and total cyanide will be analyzed only if screening indicates the presence of HE or if analysis of these constituents is required by the work plan for the contaminated area. If legacy petroleum contamination is present, the soils will also be analyzed for PCBs. Other constituents may be analyzed as necessary to meet the WAC for a receiving facility.

Storage and Disposal Method: PCS will be stored in clearly marked and appropriately constructed waste accumulation areas. Waste accumulation area postings, regulated storage duration, and inspection requirements will be based on the most restrictive waste classification appropriate to the area where the spill occurred. If the PCS is suspect or known hazardous or MLLW, it will initially be managed in a registered hazardous waste accumulation area pending analysis. All PCS will be treated and/or disposed of, at an authorized off-site facility appropriate for the waste classification.

Waste #8: Returned or Excess Samples- This waste stream consists of soil and tuff samples returned from a laboratory or samples collected but not submitted to the analytical laboratory. It is estimated that less than approximately 0.5 yd^3 of material will be generated from this activity.

Anticipated Regulatory Status: Industrial, Hazardous, LLW, MLLW, NMSW, Asbestos Containing Material

Characterization Approach: Waste characterization will be based upon analytical results obtained from the direct sampling of containerized waste or from investigation or characterization data from media associated with the returned/excess samples. Direct sampling will be conducted in accordance with LANL SOP-06.10, Hand Auger and Thin-Wall Tube Sampler or SOP-06.09, Spade and Scoop Method for Collection of Soil Samples. Representative samples will be analyzed for VOCs, SVOCs, total metals, and TCLP metals, as needed. Herbicides and pesticides will be analyzed only if the work plan requires analysis of these contaminants for investigation samples. Perchlorates, nitrate, and total cyanide will be analyzed only if required by the work plan for investigation samples. If process knowledge, odors, or staining indicate the returned samples may be contaminated with petroleum products, the materials will also be analyzed for TPH and PCBs. Other constituents may be analyzed as necessary to meet the WAC for a receiving facility.

Storage and Disposal Method: These wastes will be containerized in 5 gallon buckets, 55 gallon drums, or placed into the same containers as the environmental media from which they were taken. They will initially be stored in secure, designated waste areas. If analytical data changes the waste classification, the waste will be stored in an area appropriate for the type of waste. The wastes will be sent to an authorized on-site or off-site treatment or disposal facilities, as appropriate to their waste regulatory classification.

<u>Waste #9: Un-containerized Liquid</u> – This waste stream will consist of un-containerized liquid waste which includes, but is not limited to, the liquid which is known to be present in the sump pit. Other un-containerized liquid wastes may be discovered as the project progresses. Un-containerized liquid wastes will be transferred to appropriate containers at the point of generation. Approximately 600 gallons of Un-containerized liquid waste are expected to be generated.

Anticipated Regulatory Status: Industrial, Sanitary, Hazardous, LLW, MLLW, TSCA

Characterization Approach: Un-containerized liquid waste will be transferred to appropriate containers, such as 55-gallon drums. The waste will then be sampled for characterization.

Un-containerized liquid waste will be characterized by direct sampling. Samples will be collected from the storage container in accordance with LANL SOP-06.15, *COLIWASA Sampler for Liquids and Slurries*. If the container does not permit COLIWASA or bailer sampling, the type of sampling equipment used will be appropriate for the waste container and properly operated in accordance with Chapter 7 and Appendix E of the *RCRA Waste Sampling Draft Technical Guidance* (EPA 530-D-02-002, August 2002, http://www.epa.gov/osw/hazard/testmethods/sw846/pdfs/rwsdtg.pdf). Samples will be analyzed for VOCs, SVOCs, radionuclides, and total metals, High explosives will be analyzed only if the work plan requires analysis of these contaminants in investigation samples for the potential release site. Other constituents may be analyzed as necessary to meet the WAC for a receiving facility. If wastes will be treated on-site at the Sanitary Waste Water System (SWWS) or the Radioactive Liquid Waste Treatment Facility (RLWTF), submit a sampling request to http://esp-esh-as01-f5.lanl.gov/~esh19/database/rfa_form.shtml for additional constituents identified in Characterization Table, footnote 1. If the fluids cannot be treated on-site, they may be solidified for disposal off-site. The Material Safety Data Sheet (MSDS) for any absorbent used for solidification will be used as AK for waste characterization.

Storage and Disposal Method: Un-containerized liquid wastes will be transferred to appropriate containers at the point of generation and initially managed in secure, designated waste areas in accordance with Table 1. Acceptable knowledge will be used to determine the appropriate waste area. If insufficient AK is available, the waste should initially be managed as hazardous, until analytical data is available for characterization. If analytical data changes the waste classification, the waste will be stored in an area appropriate for the type of waste. It is expected that the un-containerized liquid waste will be treated on-site at the TA-16 High Explosives Wastewater Treatment Facility (HEWTF), the TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF), or the Sanitary Waste Water System (SWWS).

Decontamination wastes not meeting the WAC for on-site facilities will be treated and/or disposed of in authorized off-site treatment/disposal facilities. If solidification of decontamination fluids is required for transportation or disposal, it may be solidified using an approved absorbent. Solidification activities must be reviewed by the ENV-RCRA before being conducted.

REFERENCES

LANL (Los Alamos National Laboratory). "Los Alamos National Laboratory Hazardous Waste Minimization Report," (LANL, 2009).

LANL (Los Alamos National Laboratory), December, 2009. "**Investigation Work Plan for Delta Prime Site Aggregate Area Delayed Sites**" Los Alamos, New Mexico. (LANL 2009, EP2009-0660)

CHARACTERIZATION TABLE				
Waste Description	**Waste # 1 Drill Cuttings**	**Waste #2 Excavated Media**	**Waste # 3 Excavated Man Made Debris**	**Waste #4 Decontamination Fluids**
Estimated Volume	20 CY	600 CY	400 CY	< 55 gallons
Packaging	DOT approved containers	Roll-offs or on ground	Roll-offs or other containers	30 or 55 gallon drums
Regulatory classification:				
Radioactive Waste	X	X	X	X
Municipal Solid Waste (MSW)				
Waste destined for LANL's SWWS or RLWTF or HEWTF[1]				X
Hazardous Waste	X	X	X	X
Mixed (hazardous and radioactive) Waste	X	X	X	X
Polychlorinated Biphenyls-Contaminated Waste (PCBs)		X	X	
New Mexico Special Waste	X		X	
Industrial Waste	X	X	X	X
Asbestos Containing Material	X	X	X	
Characterization Method			X	
Acceptable knowledge (AK): Existing Data/Documentation		X	X	
AK: Site Characterization		X	X	X
Direct Sampling of Waste	X	X	X	X
Analytical Testing			X	
Volatile Organic Compounds (VOCs) (EPA 8260-B)	X[4]	X[4]	X[4]	X[4]
Semivolatile Organic Compounds (SVOCs) (EPA 8270-C)	X[4]	X[4]	X[4]	X[4]
Organic Pesticides (EPA 8081-A)	X[4]	X[4]	X[4]	X[4]
Organic Herbicides (EPA 8151-A)	X[4]	X[4]	X[4]	X[4]
PCBs (EPA 8082)	X[4]	X[4]	X[4]	X[4]
Total Metals (EPA 6010-B/7471-A or EPA 6020)	X	X	X[4]	X[4]
Total Cyanide (EPA 9012-A)	X[4]	X[4]	X[4]	X[4]
High Explosives Constituents (EPA 8330/8321-A)	X[4]	X[4]	X[4]	X[4]
Asbestos (EPA 600M4 or equivalent)	X[4]		X[4]	
Total petroleum hydrocarbon (TPH)-GRO (EPA 8015-M)	X[4]	X[4]	X[4]	
TPH-DRO (EPA 8015-M)	X[4]	X[4]	X[4]	X[4]
Toxicity characteristic leaching procedure (TCLP) Metals (EPA 1311/6010-B)	X[4]	X[4]	X[4]	X[4]
TCLP Organics (EPA 1311/8260-B & 1311/8270-C)	X[4]		X[4]	
TCLP Pest. & Herb. (EPA 1311/8081-A/1311/8151-A)				
Gross Alpha (alpha counting) (EPA 900)	X	X[4]		X[4]
Gross Beta (beta counting) (EPA 900)	X	X[4]	X[4]	X[4]
Tritium (liquid scintillation) (EPA 906.0)	X	X	X	X
Gamma spectroscopy (EPA 901.1)	X	X[4]	X[4]	X[4]
Isotopic plutonium (HASL-300)	X	X	X[4]	X
Isotopic uranium (HASL-300)	X	X	X[4]	X
Total uranium (EPA 6020)	X	X	X[4]	X
Strontium-90 (EPA 905)	X	X	X[4]	X
Americium-241 (HASL-300)	X	X	X[4]	X
Perchlorates (EPA 6850)	X	X[4]	X[4]	X
Nitrates/Nitrites (EPA 300.09-soil or 343.2-water)	X[4]	X[4]	X[4]	X[4]
Oil / Grease (EPA 1665)			X[4]	X[1]
Fluorine, Chorine, Sulfate (EPA 300)				X[1]
TTO (EPA 8260-B and EPA 8270-C)[2]				
Total Suspended & Dissolved Solids (TSS) and Total Dissolved Solids (TDS) (EPA 160.1 and 160.2)			**Request VOCs and SVOCs above**	X[1]
Chemical Oxygen Demand (COD) (EPA 410.4)				X[1]
pH (EPA 904c)				X[1]

Microtox or Biological Oxygen Demand (BOD)[3]				X[1]

CHARACTERIZATION TABLE (Continued)

Waste Description	Waste #5 Contact Waste	Waste #6 Municipal Solid Waste	Waste #7 Petroleum Contaminated Soils	Waste #8 Returned or Excess Samples	Waste # 9 Un-containerized Liquid Waste
Estimated Volume	5 CY	< 1 CY	< 1 CY	< 0.5 CY	600 Gal
Packaging	55 gallon drums	Plastic trash bags	30 or 55 gallon drums	Same containers as the environmental media from which they were taken or other drums.	55 gallon drums
Regulatory classification:					
Radioactive Waste	X		X	X	X
Municipal Solid Waste (MSW)		X			
Waste destined for LANL's SWWS or RLWTF[1]					X
Hazardous Waste	X		X	X	X
Mixed (hazardous and radioactive) Waste	X		X	X	X
Polychlorinated Biphenyls-Contaminated Waste (PCBs)			X		
New Mexico Special Waste			X	X	
Industrial Waste	X		X	X	X
Asbestos Containing Material				X	
Characterization Method	X				
Acceptable knowledge (AK): Existing Data/Documentation	X	X			
AK: Site Characterization				X	X
Direct Sampling of Waste			X	X	X
Analytical Testing					
Volatile Organic Compounds (VOCs) (EPA 8260-B)			X[4]	X[4]	X[4]
Semivolatile Organic Compounds (SVOCs) (EPA 8270-C)			X[4]	X[4]	X[4]
Organic Pesticides (EPA 8081-A)			X[4]	X[4]	X[4]
Organic Herbicides (EPA 8151-A)			X[4]	X[4]	X[4]
PCBs (EPA 8082)			X	X[4]	X[4]
Total Metals (EPA 6010-B/7471-A or EPA 6020)			X	X	X[4]
Total Cyanide (EPA 9012-A)			X[4]	X[4]	X[4]
High Explosives Constituents (EPA 8330/8321-A)			X[4]	X[4]	X[4]
Asbestos (EPA 600M4 or equivalent)			X[4]		
Total petroleum hydrocarbon (TPH)-GRO (EPA 8015-M)			X	X[4]	
TPH-DRO (EPA 8015-M)			X	X[4]	X[4]
Toxicity characteristic leaching procedure (TCLP) Metals (EPA 1311/6010-B)			X	X[4]	X[4]
TCLP Organics (EPA 1311/8260-B & 1311/8270-C)					
TCLP Pest. & Herb. (EPA 1311/8081-A/1311/8151-A)					
Gross Alpha (alpha counting) (EPA 900)			X[4]	X[4]	X[4]
Gross Beta (beta counting) (EPA 900)			X[4]	X[4]	X[4]
Tritium (liquid scintillation) (EPA 906.0)			X	X[4]	X
Gamma spectroscopy (EPA 901.1)			X[4]	X[4]	X[4]
Isotopic plutonium (HASL-300)			X	X	X
Isotopic uranium (HASL-300)			X	X	X
Total uranium (EPA 6020)			X	X	X
Strontium-90 (EPA 905)			X	X	X
Americium-241 (HASL-300)			X	X	X
Perchlorates (EPA 6850)			X	X	X
Nitrates/Nitrites (EPA 300.09-soil or 343.2-water)			X	X	X[4]
Oil / Grease (EPA 1665)					X[1]
Fluorine, Chorine, Sulfate (EPA 300)					X[1]

TTO (EPA 8260-B and EPA 8270-C)[2]	**Request VOCs and SVOCs above**				
Total Suspended & Dissolved Solids (TSS) and Total Dissolved Solids (TDS) (EPA 160.1 and 160.2)					X[1]
Chemical Oxygen Demand (COD) (EPA 410.4)					X[1]
pH (EPA 904c)					X[1]
Microtox or Biological Oxygen Demand (BOD)[3]					X[1]

Characterization Table (Cont'd)

[1]in addition to other analytes needed to characterize the waste (e.g., VOC, SVOC, total metals), analyze for TSS, TDS, Oil and Grease, gross alpha, gross beta, tritium, and pH for liquids destined for the LANL sanitary waste water system (SWWS). For wastes destined for the RLWTF additional constituents include TTO,TSS, COD, pH, total nitrates/nitrites, and gross alpha, gross beta (not including tritium), and gross gamma **or** the sum of individual alpha-, beta-, and gamma-emitting nuclides. Submit a sampling request to http://esp-esh-as01-f5.lanl.gov/~esh19/database/rfa_form.shtml . I

[2]TTO is the total of volatile organic and semi-volatile organic compound contaminants. Request methods EPA 8260-B (VOCs) and EPA 8270-C (SVOCs).

[3] If Microtox analysis is not available, request BOD. Submit a sampling request to http://esp-esh-as01-f5.lanl.gov/~esh19/database/rfa_form.shtml . I

[4] If needed

Signatures	Date
Project Manager (Bruce Wedgeworth)	12/15/10
Preparer (Kimberly Oman) Kimberly Oman	12-15-10
Waste Management Coordinator (Ron DeSotel)	12-16-10
ENV-RCRA Representative (Frank W. Chromec)	12-16-10
Waste Acceptance Representative Andy u. Elicio	12/16/10
Waste Certification Program Representative (Michelle Coriz) Michelle L Coriz	12-16-10

Environmental Programs (EP)
Document Signature Form

Document Catalog Number: EP2011-0264

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Amendment #1 **TA-21 Delayed Sites**	

Reason for Change:

Amendment #1 to WCSF TA-21 Delayed Sites (original EP2010-0549) is to include additional sampling scope for the DP Site Aggregate Area (DPSAA) Phase III sites located on DP Mesa within TA-21. Additional SWMUs and AOCs, for TA-21 DPSAA Phase III sites, which require sampling are as follows:

SWMUs 21-003-99, 21-024(c), , 21-006(c)-99, , 21-022(h), 21-022(h)-99, 21-022(i), 21-022(j), 21-023(a)-99,, 21-024(b), 21-024(d), 21-024(g), 21-024(k), 21-024(n), 21-024(l)-99, , 21-026(a)-99, , 21-027(a),), C-21-027,, 21-006(c)-99 and Diesel fuel spill from above ground storage tank 21-57.

This additional site investigation is included in the TA-21 Delayed Sites work scope and is expected to generate the following unchanged waste streams: **Waste # 1: Drill Cuttings (IDW), Waste # 2: Excavated Environmental Media** and **Waste # 5: Contact Waste**.

The Characterization Strategy, Characterization Table, Waste Description, Anticipated Regulatory Status and Storage and Disposal Method will remain unchanged.

Signatures	**Date**
ADEP Project Manager (Bruce Wedgeworth) Bruce Wedgeworth	8/3/11
Preparer (Kim Oman) Kim Oman	8/4/11
Waste Management Coordinator (~~Ron De Sotel~~) e Alicia Ameson	8/3/11
ENV-RCRA Representative (Jocelyn Buckley) Jocelyn K Buckley	8-4-11
WES-Waste Acceptance Representative (Andy Elicio) Andy Elicio	08/04/2011
Waste Certification Program Representative (Randy J. Martinez) Rdy J. Mtz	8/4/11

Appendix F

Analytical Program

F-1.0 INTRODUCTION

This appendix discusses the analytical methods and data-quality review for samples collected during investigations addressed in this investigation report of the DP Site Aggregate Area Delayed Sites and DP East Building Footprints at Los Alamos National Laboratory (LANL or the Laboratory). Additionally, this appendix summarizes the effects of data-quality issues on the acceptability of the analytical data.

Quality assurance (QA), quality control (QC), and data validation procedures were implemented in accordance with the Quality Assurance Project Plan Requirements for Sampling and Analysis (LANL 1996, 054609) and the Laboratory's statement of work (SOW) for analytical laboratories (LANL 1995, 049738; LANL 2000, 071233; LANL 2008, 109962). The results of the QA/QC procedures were used to estimate the accuracy, bias, and precision of the analytical measurements. Samples for QC included method blanks, matrix spikes (MSs), laboratory control samples (LCSs), internal standards (ISs), initial calibration verifications (ICVs) and continuing calibration verifications (CCVs), surrogates, and tracers.

The type and frequency of laboratory QC analyses are described in the SOW for analytical laboratories (LANL 2008, 109962). Other QC factors, such as sample preservation and holding times, were also assessed in accordance with the requirements outlined in Standard Operating Procedure (SOP) 5056, Sample Containers and Preservation.

The following SOPs, available at http://www.lanl.gov/environment/all/qa/wes.shtml were used for data validation:

- SOP-5161, Routine Validation of Volatile Organic (VOC) Analytical Data
- SOP-5162, Routine Validation of Semivolatile Organic Compound (SVOC) Analytical Data
- SOP-5163, Routine Validation of Organochlorine Pesticides (PEST) and Polychlorinated Biphenyl (PCB) Analytical Data
- SOP-5164, Routine Validation of High Explosives (HE) 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 Explosive Analytical Data
- SOP-5171, Routine Validation of Total Petroleum Hydrocarbons Gasoline Range Organics/Diesel Range Organics Analytical Data (Method 80151B)
- SOP-5191, Routine Validation of LC/MS/MS Perchlorate Analytical Data (SW-846 EPA Method 6850)

Routine data validation was performed for each data package (also referred to as request numbers), and analytical data were reviewed and evaluated based on U.S. Environmental Protection Agency (EPA) National Functional Guidelines, where applicable (EPA 1994, 048639; EPA 1999, 066649). As a result of the data validation and assessment efforts, qualifiers are assigned to the analytical records as appropriate. The data-qualifier definitions are provided in Appendix A. Sample collection logs (SCLs) and chain-of-custody (COC) forms are provided in Appendix C (on DVD). The analytical data, instrument printouts, and data validation reports are also provided in Appendix C.

F-2.0 ANALYTICAL DATA ORGANIZATION

All data collected during 2010 and 2011 investigation activities are determined to be of sufficient quality for decision-making purposes.

F-3.0 INORGANIC CHEMICAL ANALYSES

A total of 362 samples (plus 35 field duplicates) collected from the sites addressed in this investigation report were analyzed for inorganic chemicals. A total of 359 of these samples were analyzed for target analyte list (TAL) metals, nitrate, perchlorate, and total cyanide. Three samples were analyzed for chromium only. The analytical methods used for inorganic chemicals are listed in Table F-3.0-1.

Tables in the investigation report summarize all samples collected and the analyses requested for the investigation of the sites within the DP Site Aggregate Area Delayed Sites and DP East Building Footprints. All the analytical results are presented in Appendix C (on DVD).

F-3.1 Inorganic Chemical QA/QC Samples

The use of QA/QC samples is designed to produce measures of the reliability of the data. The results of the QA/QC analyses performed on a sample provide confidence about whether the analyte is present and whether the concentration reported is accurate. To assess the accuracy and precision of inorganic chemical analyses, LCSs, preparation blanks, MSs, laboratory duplicate samples, interference check samples (ICSs), and serial dilution samples were analyzed as part of the investigation. Each of these QA/QC sample types is defined in the analytical services SOW (LANL 2008, 109962) 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. For inorganic chemicals in soil or tuff, LCS percent recoveries (%R) should fall within the control limits of 75%–125% (LANL 2008, 109962).

The preparation 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; it is extracted and analyzed in the same manner as the corresponding environmental samples. Preparation blanks are used to measure bias and potential cross-contamination. All inorganic chemical results should be below the method detection limit (MDL).

MS samples assess the accuracy of inorganic chemical analyses. These samples are designed to provide information about the effect of the sample matrix on the sample preparation procedures and analytical technique. The MS acceptance criterion is 75%–125%, inclusive, for all spiked analytes (LANL 2008, 109962).

Laboratory duplicate samples assess the precision of inorganic chemical analyses. All relative percent differences (RPDs) between the sample and laboratory duplicate should be ±35% for soil (LANL 2008, 109962).

The ICSs assess the accuracy of the analytical laboratory's interelement and background correction factors used for inductively coupled plasma emission spectroscopy. The ICS %R should be within the acceptance range of 80%–120%. The QC acceptance limits are ±20%.

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

MDL (100 times for inductively coupled plasma mass spectroscopy) for valid comparison. For sufficiently high concentrations, the RPD should be within 10%.

F-3.2 Data-Quality Results for Inorganic Chemicals

The majority of the analytical results for inorganic chemicals either were not assigned a qualifier or were qualified as not detected (U) because the analytes were not detected by the respective analytical methods.

F-3.2.1 Maintenance of COC

SCL/COC forms were maintained properly for all samples analyzed for inorganic chemicals (Appendix C).

F-3.2.2 Sample Documentation

All samples analyzed for inorganic chemicals were properly documented on SCL/COC forms in the field (Appendix C).

F-3.2.3 Sample Dilutions

Some samples were diluted for inorganic chemical analyses. Some dilutions resulted in higher quantitation limits. No qualifiers were applied to any inorganic chemical sample results because of dilutions.

F-3.2.4 Sample Preservation

Preservation criteria were met for all samples analyzed for inorganic chemicals.

F-3.2.5 Holding Times

All inorganic chemical analyses were performed within prescribed holding-time requirements. No qualifiers were applied to any inorganic chemical sample results because of holding-time issues.

F-3.2.6 ICVs and CCVs

No qualifiers were applied to any inorganic chemical sample results because of ICV or CCV issues.

F-3.2.7 Interference Check Sample and/or Serial Dilutions

No qualifiers were applied to any inorganic chemical sample results because of interference check sample or serial dilution issues.

F-3.2.8 Laboratory Duplicate Samples

A total of 320 TAL metals results were qualified as estimated (J) because the sample and the laboratory 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.

F-3.2.9 Blanks

Ten nitrate results, 10 perchlorate, and 213 TAL metals results were qualified as not detected (U) because the sample results were less than or equal to 5 times the concentration of the related analytes in the equipment rinsate blank.

A total of 82 TAL metals results and 15 total cyanide results were qualified as not detected (U) because the sample result was less than or equal to 5 times the concentration of the related analyte in the preparation blank.

A total of 183 TAL metals results were qualified as estimated (J) because the sample result was greater than 5 times the concentration of the related analyte in the preparation blank.

A total of 68 TAL metals results and 6 total cyanide results were qualified as not detected (U) because the sample result was less than or equal to 5 times the concentration of the related analyte in the initial calibration blank/continuous calibration blank.

F-3.2.10 MS Samples

Seven nitrate results and 129 TAL metals results were qualified as estimated not detected (UJ) because the associated MS recovery was less than the lower acceptance limit (LAL) but greater than 10%.

Eleven TAL metals results were qualified as estimated not detected (UJ) because the associated MS recovery was greater than the upper acceptance limit (UAL).

A total of 138 TAL metals results were qualified as estimated and biased low (J-) because the associated MS recovery was less than the LAL but greater than 10%.

A total of 552 TAL metals results were qualified as estimated and biased high (J+) because the associated MS recovery was greater than the UAL.

Four perchlorate results were qualified as estimated and biased high (J+) because the MS/MS duplicate (MSD) %R was greater than 125%.

F-3.2.11 LCS Recoveries

Fifteen TAL metals results were qualified as estimated not detected (UJ) because the LCS %R was less than the LAL but greater than 10%.

F-3.2.12 Detection Limits

No qualifiers were applied to any inorganic chemical results because of detection limit issues.

F-3.2.13 Rejected Results

Nine aluminum results, 5 magnesium results, and 12 manganese results were qualified as rejected (R) because the associated MS recovery was less than 10%.

The rejected data were not used to determine the nature and extent of contamination or to assess the potential human and ecological risks. However, sufficient data of good quality are available to characterize the site(s). The results of other qualified data were used as reported and do not affect the usability of the data.

F-4.0 ORGANIC CHEMICAL ANALYSES

A total of 345 samples (plus 31 field duplicates) collected from the sites addressed in this investigation report were analyzed for organic chemicals. A total of 337 samples were analyzed for volatile organic chemicals (VOCs); 345 samples were analyzed for semivolatile organic chemicals (SVOCs); 73 samples were analyzed for polychlorinated biphenyls (PCBs); 71 samples were analyzed for dioxins/furans; seven samples were analyzed for total petroleum hydrocarbon (TPH) diesel range organics (DRO); seven samples were analyzed TPH–gas range organics (GRO); and 71 samples were analyzed for explosives compounds. All QC procedures were followed as required by the analytical laboratory SOW (LANL 1995, 049738; LANL 2000, 071233). The analytical methods used for organic chemicals are listed in Table F-3.0-1.

Tables within the investigation report summarize all samples collected and the analyses requested from the DP Site Aggregate Area Delayed Sites and DP East Building Footprints. All organic chemical results are provided in Appendix C (on DVD).

F-4.1 Organic Chemical QA/QC Samples

The use of QA/QC samples is designed to produce measures of the reliability of the data. The results of the QA/QC analyses performed on a sample provide confidence about whether the analyte is present and the concentration reported is accurate. Calibration verifications, LCSs, method blanks, MSs, surrogates, and ISs were analyzed to assess the accuracy and precision of organic chemical analyses. Each of these QA/QC sample types is defined in the analytical services SOW (LANL 2008, 109962) and is described briefly below.

Calibration verification is the establishment of a quantitative relationship between the response of the analytical procedure and the concentration of the target analyte. There are two aspects of calibration verification: initial and continuing. Initial calibration verifies the accuracy of the calibration curve as well as the individual calibration standards used to perform the calibration. Continuing calibration ensures the initial calibration is still holding and correct as the instrument is used to process samples. Continuing calibration also serves to determine that 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 overall performance on a “controlled” sample. The LCS is the primary demonstration, on a daily basis, of the ability to analyze samples with good qualitative and quantitative accuracy. The LCS recoveries should within the method-specific acceptance criteria.

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; it 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.

MS samples are used to measure the ability to recover prescribed analytes from a native sample matrix and consist of 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 between the LAL and UAL.

A surrogate compound (surrogate) is an organic compound used in the analyses of target analytes that is similar in composition and behavior to the target analytes but normally is not found in environmental samples. Surrogates are added to every blank, sample, and spike to evaluate the efficiency with which analytes are recovered during extraction and analysis. The recovery percentage of the surrogates must be within specified ranges or the sample may be rejected or assigned a qualifier.

ISs are chemical compounds added to every blank, sample, and standard extract at a known concentration. They are used to compensate for (1) analyte concentration changes that might occur during storage of the extract, and (2) quantitation variations that can occur during analysis. Internal standards are used as the basis for quantitation of target analytes. The %R for ISs should be within the range of 50%–200%.

F-4.2 Data-Quality Results for Organic Chemicals

The majority of the analytical results for organic chemicals either were not assigned a qualifier or were qualified as not detected (U) because the analytes were not detected by the respective analytical methods.

F-4.2.1 Maintenance of COC

SCL/COC forms were maintained properly for all samples analyzed for organic chemicals (Appendix C).

F-4.2.2 Sample Documentation

All samples analyzed for organic chemicals were properly documented on the SCL/COC forms in the field (Appendix C).

F-4.2.3 Sample Dilutions

Some samples were diluted for organic chemical analyses. Some dilutions resulted in higher quantitation limits. No qualifiers were applied to any organic chemical sample results because of dilutions.

F-4.2.4 Sample Preservation

Preservation criteria were met for all samples analyzed for organic chemicals.

F-4.2.5 Holding Times

Three VOC results were qualified as estimated and biased low (J-) because the extraction/analytical holding time was exceeded by less than 2 times the published method holding times.

A total of 863 VOC results were qualified as estimated not detected (UJ) because the extraction/analytical holding time was exceeded by less than 2 times the published method holding times.

F-4.2.6 ICVs and CCVs

A total of 33 SVOC result and 25 VOC results were qualified as estimated (J) because the ICV and/or CCV were recovered outside the method-specific limits.

A total of 118 SVOC results and 3 VOC results were qualified as estimated (J) because the ICV and/or CCV were not analyzed at the appropriate method frequency.

A total of 34 explosive compound results, 1280 SVOC results, and 933 VOC results were qualified as estimated not detected (UJ) because the ICV and/or CCV were recovered outside the method-specific limits.

A total of 229 VOC results and 1283 SVOC results were qualified as estimated not detected (UJ) because the ICV and/or CCV were not analyzed at the appropriate method frequency.

A total of 110 explosive compound results were qualified as estimated not detected (UJ) because they were analyzed with a relative response factor (RRF) of less than 0.05 in the initial calibration and/or CCV.

F-4.2.7 Surrogate Recoveries

A total of 32 SVOC results and 1 explosive compound result were qualified as estimated not detected (UJ) because the surrogate recovery was less than the LAL but greater than or equal to 10%.

Two dioxin/furan results were qualified as estimated and biased high (J+) because the MS/MSD %R was greater than 130%.

F-4.2.8 IS Responses

No results were qualified with IS response issues.

F-4.2.9 Blanks

A total of 180 dioxin/furan results were qualified as not detected (U) because the sample result was less than or equal to 5 times the concentration of the related analyte in the method blank.

Eight VOC results were qualified as not detected (U) because the associated sample concentration was less than 5 times or 10 times the amount in the method blank.

A total of 29 VOCs were qualified as not detected (U) because the associated sample concentration was less than 5 times the amount in the trip or equipment rinsate blank.

F-4.2.10 MS Samples

Thirteen explosive compound results were qualified as estimated not detected (UJ) because the MS/MSD RPD was greater than 30%.

F-4.2.11 Laboratory Duplicate Samples

Laboratory duplicates collected for organic chemical analyses indicated acceptable precision for all samples.

F-4.2.12 LCS Recoveries

A total of 32 SVOC results and 1 explosive compound result were qualified as estimated not detected (UJ) because the LCS %R was less than the LAL but greater than 10%.

F-4.2.13 Rejected Data

Five VOC results were qualified as rejected (R) because the LCS %R was less than10%.

The rejected data were not used to characterize the nature and extent of contamination or assess the potential human and ecological risks. However, sufficient data of good quality are available to characterize the site(s). The results of other qualified data were used as reported and do not affect the usability of the data.

F-5.0 RADIONUCLIDE ANALYSES

A total of 358 samples (plus 35 field duplicates) collected from the sites addressed in this investigation report were analyzed for radionuclides. A total of 358 samples were analyzed for gamma-emitting radionuclides, 358 samples were analyzed for isotopic plutonium, 358 samples (were analyzed for isotopic uranium 354 samples were analyzed for isotopic thorium, 341 samples were analyzed for technetium-99, 358 samples were analyzed for tritium, and 358 samples were analyzed for strontium-90. The analytical methods used for radionuclides are listed in Table F-3.0-1.

Tables in the investigation report summarize all samples collected and the analyses requested from the DP Site Aggregate Area Delayed Sites and DP East Building Footprints. All radionuclide results are provided in Appendix C (on DVD).

F-5.1 Radionuclide QA/QC Samples

To assess the accuracy and precision of radionuclide analyses, LCSs, method blanks, MS samples, laboratory duplicate samples, and tracers were analyzed as part of the investigations. Each of these QA/QC sample types is defined in the analytical services SOWs (LANL 2008, 109962) and is described briefly below.

The LCS serves as a monitor of the overall performance of each step during the analysis, including sample digestion. For radionuclides in soil or tuff, LCS %R should fall between the control limits of 80%–120%.

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; it is analyzed in the same manner as the corresponding environmental samples. Method blanks are used to assess the potential for sample contamination during analysis. All radionuclide results should be below the minimum detectable concentration (MDC).

MS samples assess the accuracy of inorganic chemical analyses. These samples are designed to provide information about the effect of the sample matrix on the sample preparation procedures and analytical technique. The MS acceptance criterion is 75%–125%.

Tracers are radioisotopes added to a sample for the purposes of monitoring losses of the target analyte. The tracer is assumed to behave in the same manner as the target analytes. The tracer recoveries should fall between the LAL and UAL.

Laboratory duplicate samples assess the precision of radionuclide analyses. All RPDs between the sample and laboratory duplicate should be ±35% for soil (LANL 2008, 109962).

F-5.2 Data-Quality Results for Radionuclides

The majority of the analytical results for radionuclides either were not assigned a qualifier or were qualified as not detected (U) because the analytes were not detected by the respective analytical methods.

All procedures were followed as required by the analytical services SOW (LANL 2008, 109962). Some sample results were qualified as not detected (U) because the associated sample concentration was less than or equal to the MDC. Some sample results were qualified as not detected (U) because the associated sample concentration was less than or equal to 3 times the total propagated uncertainty (TPU). This data qualification is related to detection status only, not to the quality of the data.

F-5.2.1 Maintenance of COC

SCL/COC forms were maintained properly for all samples (Appendix C).

F-5.2.2 Sample Documentation

All samples were properly documented on the SCL/COC forms in the field (Appendix C).

F-5.2.3 Sample Dilutions

Some samples were diluted for radionuclide analyses. No qualifiers were applied to any radionuclide sample results because of dilutions.

F-5.2.4 Sample Preservation

Preservation criteria were met for all samples analyzed for radionuclides.

F-5.2.5 Holding Times

A total of 29 technetium-99 results were qualified as estimated not detected (UJ) because the holding time was greater than 1 and less than or equal to 2 times the applicable holding-time requirement.

A total of 36 isotopic thorium results were qualified as estimated biased low (J-) because the holding time was greater than 1 and less than or equal to 2 times the applicable holding-time requirement.

F-5.2.6 Method Blanks

Method blank criteria were met for all samples analyzed for radionuclides.

F-5.2.7 MS Samples

MS criteria were met for all samples analyzed for radionuclides.

F-5.2.8 Tracer Recoveries

Nine isotopic thorium results and 13 isotopic uranium results were qualified as estimated and biased high (J+) because the tracer recovery was greater than the UAL.

One americium-241, three isotopic thorium, and two isotopic uranium results were qualified as estimated and biased low (J-) because the tracer recovery was less than the LAL but equal to or greater than 10%R.

One americium-241 result, six technetium-99 results, and one isotopic uranium result were qualified as estimated not detected (UJ) because the tracer recovery was less than the LAL but equal to or greater than 10%R.

F-5.2.9 LCS Recoveries

LCS recovery criteria were met for all samples analyzed for radionuclides.

F-5.2.10 Laboratory Duplicate Samples Recoveries

Three isotopic plutonium results were qualified as estimated (J) because the associated duplicate sample has duplicate error ratio (DER) or relative error ratio (RER) greater than the analytical laboratory's acceptance limits.

F-5.2.11 Rejected Data

A total of 170 cesium-134 results and 1 cesium-137 result were qualified as rejected (R) because spectral interferences prevented positive identification of the analytes.

Six isotopic plutonium results were qualified as rejected (R) because the associated duplicate sample has DER or RER greater than the analytical laboratory’s acceptance limits

The rejected data were not used to determine the nature and extent of contamination or to assess the potential human and ecological risks. However, sufficient data of good quality are available to characterize the sites. The results of other qualified data were used as reported and do not affect the usability of the data.

F-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)

EPA (U.S. Environmental Protection Agency), October 1999. "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review," EPA540/R-99/008, Office of Emergency and Remedial Response, Washington, D.C. (EPA 1999, 066649)

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), March 1996. "Quality Assurance Project Plan Requirements for Sampling and Analysis," Los Alamos National Laboratory document LA-UR-96-441, Los Alamos, New Mexico. (LANL 1996, 054609)

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), June 30, 2008. "Exhibit 'D' Scope of Work and Technical Specifications, Analytical Laboratory Services for General Inorganic, Organic, Radiochemical, Asbestos, Low-Level Tritium, Particle Analysis, Bioassay, Dissolved Organic Carbon Fractionation, and PCB Congeners," Los Alamos National Laboratory document RFP No. 63639-RFP-08, Los Alamos, New Mexico. (LANL 2008, 109962)

Table F-3.0-1
Inorganic Chemical, Organic Chemical, and Radionuclide Analytical Methods for Samples Collected at the DP Site Aggregate Area Delayed Sites and DP East Building Footprints

Analytical Method	Analytical Description	Analytical Suite
Inorganic Chemicals		
EPA 300.0	Ion chromatography	Anions (nitrate)
EPA SW-846: 6010B	Inductively coupled plasma emission spectroscopy—atomic emission spectroscopy	Aluminum, antimony, arsenic, barium, beryllium, calcium, cadmium, cobalt, chromium, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium, thallium, uranium, vanadium, and zinc (TAL metals)
EPA SW-846:6020	Inductively coupled plasma mass spectrometry	Aluminum, antimony, arsenic, barium, beryllium, calcium, cadmium, cobalt, chromium, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc (TAL metals)
EPA SW-846:9012A	Automated colorimetric/off-line distillation	Total cyanide
EPA SW-846:6850	Liquid chromatography–mass spectrometry/mass spectrometry	Perchlorate
EPA SW-846:7471A	Cold vapor atomic absorption	Mercury
Organic Chemicals		
EPA SW-846: 8082	Gas chromatography (GC)	PCBs
EPA SW-846:8240 EPA SW-846:8260 EPA SW-846:8260B	Gas chromatography/mass spectrometry (GC/MS)	VOCs
EPA SW-846:8270C	GC/MS	SVOCs
EPA SW-846: 8321A _MOD	High performance liquid chromatography	Explosive compounds
SW-846:8290	High-resolution GC/high-resolution MS	Dioxins, furans
EPA SW-846:8015M_EXTRACTABLE	GC/flame ionization detector	TPH-DRO
EPA SW-846:8015M_PURGEABLE	GC/flame ionization detector	TPH-GRO
Radionuclides		
EPA 901.1	Gamma spectroscopy	Cesium-134, cesium-137, cobalt-60, sodium-22
HASL Method 300:Am-241 HASL Method 300:ISOPU HASL Method 300:ISOU HASL Method 300:ISOTH	Alpha spectroscopy, gas-flow proportional counting	Americium-241 Isotopic plutonium Isotopic uranium Isotopic thorium
HASL Method 300:Tc-99	Gamma spectroscopy	Technetium-99
EPA 905.0	Gas proportional counting	Strontium-90
EPA 906.0	Liquid scintillation	Tritium